No. 18-956

IN THE

Supreme Court of the United States

GOOGLE LLC,

Petitioner,

v.

ORACLE AMERICA, INC.

Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF FOR INTERNATIONAL BUSINESS MACHINES CORP. AND RED HAT, INC. AS *AMICI CURIAE* SUPPORTING PETITIONER

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TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Cases **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Cases **Page(s)**

Statutes and Rules

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

TABLE OF AUTHORITIES
Cont'd

Secondary Sources **Page(s)**

INTEREST OF AMICI CURIAE

Computer interfaces are not copyrightable. That simple, yet powerful principle has been a cornerstone of technological and economic growth for over sixty years.[1] When published (as has been common industry practice for over three decades) or lawfully reverse engineered,[2] they have spurred innovation through competition, increased productivity and economic efficiency, and connected the world in a way that has benefited commercial enterprises and consumers alike.

Not once, until this case, has a Court of Appeals held that software interfaces are protected by copyright separate and apart from the code embodying the implementation of those interfaces. This is not because this principle is fringe; it is because it has always been accepted—based on legal precedent dating back 140 years. Congress has been aware of not just the existence, but the fundamental utility of this truism within the computing industry since the 1950s and not once has it undertaken any effort to modify the settled body of law and industry expectations, lest it derail the vast and innovative economy that has

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the amici curiae or their counsel made a monetary contribution to its preparation or submission. The parties have consented to the filing of this brief.

[2] When kept as a trade secret, interfaces have been immensely valuable to their creators, both in maintaining exclusive closed systems and in licensing to others to develop interoperable products—often leading to vigorous debates in legislatures, courts, and the public throughout the modern computing era.

come to rely upon them.[3] Absent a clear and certain signal from Congress to modify this crucial balance and the positive effect it has had on every application from aviation to medicine, this Court should not act to disrupt settled law.[4]

International Business Machines Corp. ("IBM") and Red Hat, Inc. ("Red Hat") are leading developers of software and information technology systems that, by means of interfaces,[5] provide for interoperation of diverse programs and programmable devices. The decision below threatens to undermine and adversely impact a core aspect of IBM's and Red Hat's business, as well as that of their clients.

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[3] *Cf.* U.S. Copyright Office, *Software-Enabled Consumer Prods.* 52 (2016), https://www.copyright.gov/policy/software/software-full-report.pdf ("The Copyright Office recognizes the importance of preserving the ability to develop products and services that can interoperate with software-enabled consumer products, and the goal of preserving competition in the marketplace.").

[4] *Cf. Parker v. Flook*, 437 U.S. 584, 596 (1978) ("We would require a clear and certain signal from Congress before approving the position of a litigant who, as respondent here, argues that the beachhead of privilege is wider, and the area of public use narrower, than courts had previously thought.") (quoting *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 531 (1972)).

[5] *See* IBM Corp., *Dictionary of IBM & Computing Terminology* 44, https://www.ibm.com/ibm/history/documents/pdf/glossary.pdf (last visited Jan. 13, 2020) (the "IBM Glossary") ("**interface** 1. *n.* A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics, as appropriate. The concept includes the specification of the connection of two devices having different functions. 2. *n.* Hardware, software, or both, that links systems, programs, or devices."). The IBM Glossary defines a number of technical terms used in briefs in this case.

Given that IBM and Red Hat have collectively developed tens of thousands of software programs comprising hundreds of millions of lines of code, combined with the companies' service of clients across all industries in over 170 countries worldwide, amici are particularly well-positioned to address whether software interfaces are copyrightable.

IBM brings a balanced view to the issue in this case. As its very name suggests, IBM's business is truly international. IBM licenses and makes available software programs throughout the world, relying upon underlying copyrights to protect such software programs from unauthorized use. As one of the most successful licensors of software technology in the world, IBM relies on its ability to enforce its copyrights in software in order to protect its business interests. IBM continues to invest billions of dollars annually in software technology in reliance on a mature, fair, and balanced U.S. copyright system.

At the forefront of business innovation for more than 100 years,[6] IBM has enabled countless technical achievements from the Apollo missions to the first publicly accessible quantum computers in the cloud.

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[6] *See IBM's 100 Icons of Progress*, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons (last visited Jan. 13, 2020) (listing examples). IBM's sustained commitment to research and innovation has resulted in six Nobel laureates, five National Medal of Science recipients, thirteen winners of the National Medal of Technology, six winners of the Turing Award, and twenty-seven consecutive years of receiving the most patents issued from the U.S. Patent and Trademark Office.

Just since this case began, IBM has accelerated innovation in every facet of computing technology. Not long after Respondent brought this suit over Java interface specifications developed in the 1990s, IBM deployed an artificial intelligence ("AI") system that beat the reigning all-time human champion on *Jeopardy!*,[7] signaling the emergence of AI as a commercially viable technology that is now embedded in nearly every form of computing. IBM also responded to industry demand for workload portability and client choice by championing the hybrid cloud computing model, enabling interoperability across the ever-growing and competitive cloud computing landscape.[8] To this end, IBM has accelerated development of award-winning products[9] that drive efficiency, competition, and innovation that enterprises can leverage in an ever-changing IT landscape.[10]

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[7] John Markoff, *Computer Wins on 'Jeopardy!': Trivial, It's Not*, N.Y. Times (Feb. 16, 2011), https://www.nytimes.com/2011/02/17/science/17jeopardy-watson.html.

[8] IBM's 2019 acquisition of Red Hat, discussed *infra*, was the culmination of IBM's twenty-year commitment to open source software development. This has included everything from multi-billion dollar investments toward bringing Linux to enterprise quality to the development of open source technology that empowers *clients* to choose how their data is processed, stored and secured.

[9] *See, e.g.*, *IBM Multicloud Manager: 2019 Edison Award Gold Winner*, Edison Awards, https://edisonawards.com/ibm-mcm.php (last visited Jan. 13, 2020).

[10] Industry analysts predict that, "By 2021, over 90% of enterprises worldwide will rely on a mix of on-premises/dedicated private clouds, several public clouds, and legacy platforms to meet

IBM is the leader in providing industry, academia, and government researchers with direct access to industry-leading quantum computing platforms via the cloud.[11] The public, from the most sophisticated data scientists to high school students just learning how to code, access these innovations in the same way all modern systems are accessed—via software interfaces.

This is not a recent development. Most, if not all, technologies discussed in the parties' briefs, by the amici, and at issue in prior cases involving computing interfaces, were enabled by IBM public disclosures, including specifications of interfaces to mainframe computers (giving birth to the independent software developer and hardware peripheral industries), specifications of the first relational database (making the use of extraordinarily large volumes of data accessible to average businesses),[12] and the IBM PC BIOS

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their infrastructure needs." Frank Della Rosa et al., IDC, *IDC FutureScape: Worldwide Cloud 2020 Predictions* 2 (2019).

[11] Sara Castellanos, *IBM's Quantum-Computing Service Tops 100 Customers*, Wall St. J. (Jan. 8, 2020), https://www.wsj.com/articles/ibms-quantum-computing-service-tops-100-customers-11578481200.

[12] *See* D.D. Chamberlin et al., *SEQUEL 2: A Unified Approach to Data Definition, Manipulation, and Control*, 20 IBM J. Res. & Dev. 560 (1976). "In 1979, Relational Software, Inc. (now Oracle) introduced the first commercially available implementation of SQL. Today, SQL is accepted as the standard RDBMS language." *Database SQL Language Reference: History of SQL*, ORACLE® Help Center, https://docs.oracle.com/cd/E11882_01/server.112/e41084/intro001.htm#SQLRF50932. Considering it to be in the public domain, and because it was "powerful, uniform, and relatively easy

source code (launching the "IBM compatible" revolution).[13] Enabling interoperability with third-party computing and network devices, publishing interface specifications to guide this necessary integration effort, and the technical achievements enabled by these efforts are not new to IBM or to the advancement of computing—they are critical to it.

While an ever-increasing number of IBM software interfaces, including for AI[14] and cloud[15] applications, are published, IBM maintains others as proprietary assets and protects them as trade secrets, sometimes making them available for licensing,[16] but then only

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to grasp, [Oracle founder] Ellison and company chose to implement versions for a number of machines, from minis up," relying on the presumption that "IBM will educate people to SQL." Bill Musgrave, *A Sequel for Data Bases*, Datamation, March 1981, at 69. Oracle's goal was to create an implementation that was consistent with IBM's "so that there would be a common interface with compatible error codes and everything else." Computer History Museum, *Oral History of Donald Chamberlin* 26 (2009), https://archive.computerhistory.org/resources/text/Oral_History/Chamberlin_Don/102702111.05.01.acc.pdf.

[13] *See The PC: Personal Computing Comes of* Age, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons/personal-computer/ (last visited Jan. 13, 2020).

[14] *See Integrate IBM Watson APIs in Your Apps*, IBM Watson Studio, https://dataplatform.cloud.ibm.com/docs/content/wsj/getting-started/wdp-apis.html (last updated Jan. 7, 2020).

[15] *See API Specs*, IBM Cloud, https://cloud.ibm.com/docs/infrastructure/cis?topic=cis-api-specs (last updated Mar. 14, 2019).

[16] *See, e.g.*, Paul Scheuer, *Dell EMC and IBM Renew Licensing Agreements Through 2021. Cooperative Support Agreement Continues in Perpetuity,* Dell EMC: Everything Mainframe at EMC

on a confidential basis. Once its interfaces are published, however, IBM has never treated them, and does not now treat them, as copyrightable subject matter. This fundamental principle on which IBM has based its business has not changed in view of any action by Congress, or this Court, in the last sixty years.

Consistent with IBM's experience, businesses in all industries, clients and competitors alike, have come to rely on unrestricted access to software interfaces in order to stitch together complex systems from multiple vendors, improve upon existing products to drive competition and innovation, and afford the businesses that own the data on these systems the opportunity to make economically efficient decisions, including migrating to the cloud and orchestrating workloads amongst vigorously competing cloud providers.

Red Hat is the world's largest developer of enterprise open source software solutions.[17] Red Hat's customers include more than ninety percent of the Fortune 500.[18] Using a community-powered approach to

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(Oct. 30, 2018, 1:57:46 PM), https://community.emc.com/community/connect/everything-mainframe/blog/2018/10/30/dell-emc-and-ibm-renew-licensing-agreements-through-2021-cooperative-support-agreement-continues-in-perpetuity.

[17] *See Our Company: Building a Better Foundation for the Future of IT*, Red Hat, https://www.redhat.com/en/about/company (last visited Jan. 13, 2020).

[18] *Id.*

software development,[19] Red Hat has developed reliable, high-performing, enterprise-quality cloud, middleware, storage, and virtualization technologies including Red Hat Enterprise Linux ("RHEL"),[20] an open source operating system that Red Hat has adapted and certified to interoperate with thousands of diverse hardware, software, and cloud products and services. [21]

Red Hat, as a continuous innovator in the open source software ecosystem, with significant experience and product offerings in numerous and diverse software technologies, has a stake in the consistent and correct determination of the scope of copyright protection that applies to interfaces of computer programs, including the Java platform interface at stake in this case. Open source software development relies on the availability of and unencumbered access to

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[19] "What few people realized back in the 90s was that open source software doesn't mean the end of proprietary technologies. Rather, it provides a stable environment upon which proprietary technologies can be built. That's the opportunity that Red Hat seized more than two decades ago, with a new era of computing dawning, that is what lays before it today." Greg Satell, *How Red Hat Helped Make Open Source a Global Phenomenon*, Inc. (Jan. 6, 2019), https://www.inc.com/greg-satell/how-red-hat-scaled-from-an-unlikely-startup-to-a-major-global-enterprise.html.

[20] *See Red Hat Enterprise Linux*, Red Hat, https://www.redhat.com/en/technologies/linux-platforms/enterprise-linux (last visited Jan. 13, 2020).

[21] *See Ecosystem Catalog*, Red Hat, https://catalog.redhat.com (last visited Jan. 13, 2020).

software interfaces, including products that are compatible with or interoperate with other computer products, platforms, and services.

Red Hat has a long and extensive history of developing software written in Java as well as implementations of the Java programming language. Red Hat's significant involvement with Java development over the last twenty years has included extensive contributions to OpenJDK,[22] an open source implementation of the Java platform sponsored by Respondent, and the development of JBoss,[23] a suite of Java-based middleware solutions for running enterprise applications.

Red Hat continues to contribute to various open source Java community software development projects as well as packaging and supporting many Java technologies within Red Hat's flagship RHEL product,[24] the world's leading enterprise Linux operating system platform, as well as other products, including

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[22] *See OpenJDK FAQ*, OpenJDK (Dec. 18, 2010), https://openjdk.java.net/faq/.

[23] *See Understanding Middleware*, Red Hat, https://www.redhat.com/en/topics/middleware (last visited Jan. 13, 2020); *Red Hat JBoss Enterprise Application Platform*, Red Hat, https://www.redhat.com/en/technologies/jboss-middleware/application-platform (last visited Jan. 13, 2020).

[24] "RHEL is far more than just a Linux distribution. It's the foundation for everything and all things business IT in 2019. AI, Internet of Things (IoT), containers, DevOps -- you name it, it runs on Linux. And, quite often that Linux is Red Hat's Linux." Steven J. Vaughan-Nichols, *RHEL 8 Released*, ZDNet (May 7, 2019, 6:00 PM), https://zd.net/37WLssj.

Red Hat Virtualization,[25] an enterprise-grade server and desktop virtualization platform built on RHEL, and Red Hat Satellite,[26] a management solution for configuring systems across physical, virtual, and cloud environments.

Red Hat, acquired by IBM last year, continues to operate as a distinct unit, preserving the independence and neutrality of Red Hat's open source development heritage and commitment, current product portfolio and go-to-market strategy, and unique development culture.

As leading developers of software, IBM and Red Hat are vitally interested in the legal status of software interfaces, whose use is fundamental[27] to innovation by establishing compatibility between hardware and software components in computer systems that facilitate innovation and drive economic growth.

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[25] *See Red Hat Virtualization*, Red Hat, https://www.redhat.com/en/technologies/virtualization/enterprise-virtualization (last visited Jan. 13, 2020).

[26] *See Red Hat Satellite*, Red Hat, https://www.redhat.com/en/technologies/management/satellite (last visited Jan. 13, 2020).

[27] Industry analysts predict that, "By 2022, 90% of new digital services will be built as composite applications using public and internal API-delivered services; half of those will leverage artificial intelligence (AI) and machine learning (ML)." Della Rosa et al., *supra* note 10, at 2.

SUMMARY OF THE ARGUMENT

Software interfaces are crucial to every critical technology that interacts with the cloud[28] to expand and enrich our experience with connected devices,[29] from self-driving cars to personal fitness apps. By allowing access to content from anywhere in the world with an Internet connection, these technologies provide users with an unprecedented degree of mobility; their benefits—including scalability, workload migration, resiliency, and cost savings—are plentiful for both consumers and businesses alike.[30] In order to address myriad challenges, from cybersecurity threats to anticompetitive vendor lock-in, technology that permits data *owners* to choose when and where to run

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[28] IBM and RHT are founding members of the Cloud Native Computing Foundation, an organization of pioneering technology companies dedicated to developing common platforms for deploying cloud native applications and services. *New Cloud Native Computing Foundation to Drive Alignment Among Container Technologies*, Cloud Native Computing Foundation (June 21, 2015), https://www.cncf.io/announcement/2015/06/21/new-cloud-native-computing-foundation-to-drive-alignment-among-container-technologies/.

[29] In 2013, IBM dedicated MQTT (the Message Queuing Telemetry Transport) to become an open protocol for messaging amongst connected devices and underpins much of today's Internet of Things. Joab Jackson, *OASIS: MQTT to Be the Protocol for the Internet of Things*, PCWorld (Apr. 26, 2013, 11:50 AM), https://www.pcworld.com/article/2036500/oasis-mqtt-to-be-the-protocol-for-the-internet-of-things.html.

[30] *See* Damon C. Andrews & John M. Newman, *Personal Jurisdiction and Choice of Law in the Cloud*, 73 Md. L. Rev. 313, 324-29 (2013); *see also* Kevin Werbach, *The Network Utility*, 60 Duke L.J. 1761, 1815-23 (2011); *see generally* Joe Weinman, *Cloudonomics: The Business Value of Cloud Computing* (2012).

their workloads is of paramount concern to the industry—this is (and always has been) a fundamental value proposition of interoperable systems.

It has long been understood that software interfaces, as distinct from the software implementations of those interfaces, are not copyrightable subject matter. That is because the copyright in a work of authorship does not extend to any "system" or "method of operation" that may be "embodied in" the work. 17 U.S.C. § 102(b). Properly understood, software interfaces embody systems and methods of operation that § 102(b) expressly excludes from copyright protection. *Cf. Perris v. Hexamer*, 99 U.S. 674, 675-76 (1879) (copyright in maps did not extend to a "system of coloring and signs" for identifying real property characteristics or to a "key" which explained symbolic meanings of coloring and signs). As shown in Appendices A and B to this brief, *post*, the subject matter held uncopyrightable in *Perris* is highly analogous to the "declarations" and system of notation disclosed in Respondent's asserted work Java 2 Standard Edition, Version 5.0 ("J2SE").

Contrary to the decision below, the statutory terms "system" and "method of operation" are much broader than the statutory term "idea." Whether there are "multiple ways" (*Oracle Am., Inc. v. Google, Inc.*, 750 F.3d 1339, 1367 (Fed. Cir. 2014)) to design a system is irrelevant to whether a system *is* a system—as *Perris* illustrates. Further, as *Perris* illustrates and as 17 U.S.C. § 102(b) codifies, the copyright in a work excludes any system or method of operation that may be "embodied in" (*id.*) the work; the exclusion is not limited to subject matter that is external to a work.

Unrestricted use of software interfaces is an essential aspect of all software development and has long promoted competition, widespread innovation, and progress in the computer, information technology, communication technology, and networking fields. Innovation in these fields would be impeded, not advanced, if software interfaces were now deemed outside of 17 U.S.C. § 102(b) and, as such, a basis for opportunistic attempts to control functional bridges between independently developed software products.

ARGUMENT

I. THE DECISION BELOW IS CONTRARY TO LONGSTANDING INDUSTRY PRACTICE AND HARMFUL TO INNOVATION.

In holding that software interfaces are subject to copyright control, the Federal Circuit's 2014 decision in this case contravenes longstanding industry practice.

In the 1950s IBM developed Fortran,[31] a computer language that, by means of interfaces, enabled pre-

[31] *FORTRAN: The Pioneering Programming Language*, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons/fortran/ (last visited Jan. 13, 2020).

written programs to be executed on and by any computer processor[32] having a Fortran compiler.[33] In the 1960s IBM developed System/360,[34] a family of interoperable products whose modular design and stable software interfaces enabled a computer to interoperate with software and hardware devices of various manufacturers.[35] In the 1970s IBM developed Structured Query Language ("SQL"),[36] a technology that, by means of interfaces, permits databases to be queried by reference to relations rather than physical memory locations. Unrestricted use of Fortran, System/360,

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[32] *See* IBM Glossary at 73 ("**processor** *n.* In a computer, a functional unit that interprets and executes instructions. A processor consists of at least an instruction control unit and an arithmetic and logic unit.").

[33] *See* IBM Glossary at 16 ("**compiler** 1. *n.* A program that translates a source program into an executable program (an object program).").

[34] *System 360: From Computers to Computer Systems*, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons/system360/ (last visited Jan. 13, 2020).

[35] *See Cal. Comput. Prods., Inc. v. Int'l Bus. Machs. Corp.*, 613 F.2d 727, 743 (9th Cir. 1979) (rejecting IBM rival's claim that it "was competitively disadvantaged as a result of these [interface] design changes, because it could not legally begin to copy the 2319A until IBM shipped the first of these disk drives, thereby disclosing the design requirements"); Shigeru Takahashi, *The Rise and Fall of Plug-Compatible Mainframes*, IEEE Annals Hist. Computing, Jan.-March 2005, at 4 (describing the role of interfaces in the plug-compatible mainframe market and, ultimately, the role of Linux in supplanting that interoperable business model with another).

[36] *Relational Database*, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons/reldb/ (last visited Jan. 13, 2020).

and SQL interfaces enabled IBM rivals—including Respondent[37]—to bring out their own systems and methods for creating, maintaining, and using software and hardware that led to an influx of market entrants and dramatic growth in innovation in both the computing industry and every business that relied upon IBM products.

That was just the beginning. Reliance on the underlying principle that software interfaces are not copyrightable has continued uninterrupted to the contemporary use of interfaces to bridge massive private data centers with cloud computing infrastructure, connect devices in the Internet of Things that inherently rely on dispersed computing resources from countless vendors, and bring researchers closer to solving previously "unsolvable" problems using quantum computers. According to industry analysts, the market for software to help companies manage the proliferation of software interfaces across their computing environments is about $750 million and is growing by over thirty percent per year.[38] As the complexity of interactions between computer systems continues to grow, companies' reliance on interfaces to stay competitive also grows.[39]

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[37] *See supra* note 12.

[38] Maureen Fleming, IDC, *Worldwide Integration and API Management Software Market Shares, 2018: Portable Cloud Integration Is a Fastest-Growing Segment* 10 tbl.6 (2019), http://idcdocserv.com/US44786119e_IBM.

[39] *See, e.g.*, Andy Patrizio, *What is API Management?*, Datamation (June 4, 2019), https://www.datamation.com/applications/what-is-api-management.html ("API management also

17 U.S.C. § 102(b) was enacted on October 19, 1976. Pub. L. No. 94-553, 90 Stat. 2541. Its terms preserved the legal status of software interfaces and supported the development and commercialization of important new software-based products and services. Linux, an open source operating system that IBM and Red Hat have both contributed to and adapted[40] to provide enterprise-grade stability, security, and computing performance, is a leading example.

Use of known systems for identifying software units is an essential aspect of software development. Use of interfaces for compatibility and interoperability purposes is also essential to the operation of information and communication technologies and infrastructures. Interoperability[41] is the very foundation of

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help businesses bridge legacy systems with modern applications, making it possible for legacy systems to talk to the cloud without modification or migration.").

[40] *See Linux: The Era of Open Innovation*, IBM, https://www.ibm.com/ibm/history/ibm100/us/en/icons/linux/ (last visited Jan. 13, 2020).

[41] Respondent has misleadingly asserted: "Google wanted . . . to copy enough code to make Android familiar . . . , but not copy all the code that would be required for interoperability." Opening Brief and Addendum of Plaintiff-Appellant at 65, Oracle Am., Inc. v. Google Inc., 750 F.3d 1339 (Fed. Cir. 2014) (No. 13-1021), ECF No. 42; *see also* Br. in Opp'n to Cert. at 9 ("Google also undermined 'write once, run anywhere' by deliberately making Android *in*compatible with the Java platform . . . ."). Contrary to Respondent's suggestion, copying and use of copyright-ineligible subject matter is encouraged by 17 U.S.C. § 102(b) and has no bearing on the first question presented in this case. And while technologies exist for providing interoperability between many different types of natively incompatible components or objects,

the Internet and of countless devices and services that depend upon it.

Unrestricted use of existing software interfaces has promoted competition and progress in the computer, information technology, communication technology, and networking fields, and is an essential aspect of all software development including both proprietary and open source software development.[42] For example, the popular WordPress content management system is developed under a collaborative open source model. Some implementations of Java platform interfaces, such as Respondent's OpenJDK project (to which IBM and Red Hat are major contributors) and Red Hat's JBoss Enterprise Application Platform, are made available under open source license terms. The rapid pace of innovation is enabled by the ability to use interfaces that are unrestricted

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"interoperability" also encompasses interaction with a *selected* component or object, such as a particular "virtual machine" (IBM Glossary at 91) whose features may not exist in a rival's virtual machine. Respondent itself has utilized this form of interoperability. *See, e.g.*, Inco, Inc., *Oracle vs. IDM: Comparative Analysis*, at 8-1 (1981), https://apps.dtic.mil/dtic/tr/fulltext/u2/a108526.pdf ("Certain features of SEQUEL as defined [by IBM] . . . were not implemented in Oracle.").

[42] "Enterprise-grade open source software has become ubiquitous across enterprise IT architectures . . . used by most, if not all, enterprises to support a broad range of mission-critical applications and business services. . . . [open source] often provide the basis of critical new technologies . . . open source is more likely to lead the charge toward innovation." Al Gillen & Mary Johnston Turner, IDC, *White Paper: Enterprise-Grade Open Source: An Imperative for Modern IT* (2016), https://red.ht/2tQuzAR.

by copyright protection and the compatible products described on pages 13-15 above, would likely never have been developed if, at the time, software interfaces had been viewed as subject to appropriation under the "extremely low"[43] standard for copyright protection. *Cf. Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 819 (1st Cir. 1995) (Boudin, J., concurring) ("[T]he 'cost' side of the equation may be different where one places a very high value on public access to a useful innovation that may be the most efficient means of performing a given task."), *aff'd by an equally divided court*, 516 U.S. 233 (1996).

II. 17 U.S.C. § 102(b) EXCLUDES SOFTWARE INTERFACES FROM COPYRIGHT PROTECTION.

As noted above, an interface[44] permits interoperation between systems, programs, entities, or devices, and this is so regardless of whether the interface is realized in hardware (e.g., a plug and socket) or software. Software interfaces embody formal systems of notation, as this case illustrates.

In its Brief in Opposition, Respondent provided the following example of a Java software interface:[45]

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[43] *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991).

[44] *See* IBM Glossary, *supra* note 5.

[45] Respondent has wrongly asserted, "'Software interface' is a term Google invented for its petition . . . . It is as meaningless as asking whether protection extends to a 'verbal interface.'" Br. in Opp'n to Cert., at 12. In fact, not only is "interface" a standard term in computing (*see* IBM Glossary, *supra* note 5, at 44), but

public abstract void verify (PublicKey key, String sigProvider)
throws CertificateException,No-SuchAlgorithmException, InvalidKeyException,
NoSuchProviderException, SignatureException

Although bearing a superficial resemblance to natural language writing, the above text embodies part of a formal system for denoting entities[46] that perform specific functions (in this instance, an entity that verifies whether a cryptographic certificate has been validly signed). Although the system of notation disclosed in Respondent's work J2SE might have incorporated different terminology than it did (e.g., some word other than "verify" as a name for the entity's function), use of the system actually embodied in J2SE requires that a reference to a new entity having the functional characteristics of the entity identified

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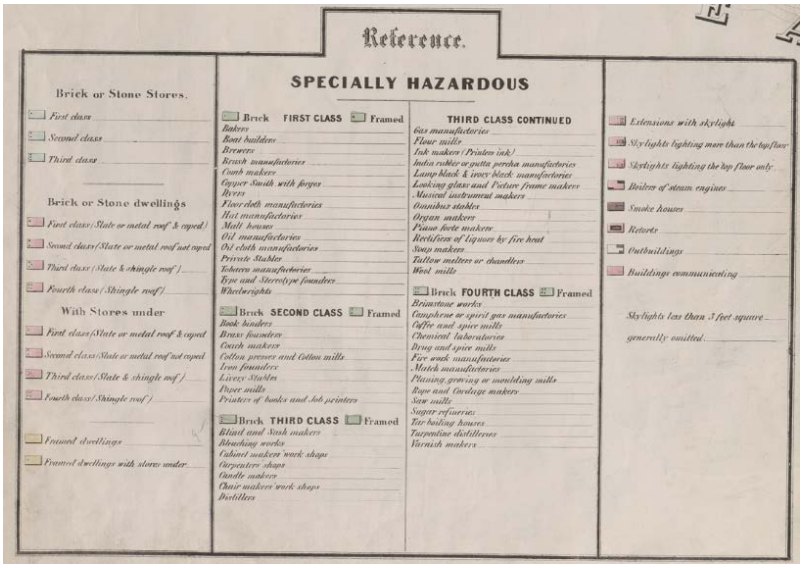
Respondent's predecessor's Deputy General Counsel, Peter M.C. Choy, authored a brief on behalf of American Committee for Interoperable Systems (ACIS), an industry organization (of which Sun was a founding member), which stated: "The computer products developed by ACIS companies can achieve interoperability only if they can conform to the internal *software interface* standards established by other vendors." Brief Amicus Curiae of Am. Comm. for Interoperable Sys. at 2, Apple Comput., Inc. v. Microsoft Corp., 35 F.3d 1435 (9th Cir. 1994) (No. 93-16867) (emphasis added), https://www.ccianet.org/wp-content/uploads/2014/10/Apple-Computer-Inc.-v.-Microsoft-Corporation-and-Hewlett-Packard-Company.pdf.

[46] James Gosling et al., *The Java™ Language Specification* § 6.1 (3d ed. 2005), https://docs.oracle.com/javase/specs/jls/se6/jls3.pdf ("A *declaration* introduces an entity into a program and includes an identifier (§3.8) that can be used in a name to refer to this entity.").

above (i.e., verification of a signed cryptographic certificate) do so using the exact terminology reproduced above.

The lines of code reproduced above, and the system of notation that those lines embody, are highly analogous to the system and system embodiments that were held, in *Perris*, to be uncopyrightable. *Perris* involved a claim to copyright in the system identified below and in Appendices A and B, *post*:[47]



The above system was disclosed and deployed by its developer, William Perris, in a series of maps of the city of New York. The maps "exhibit[ed] each lot and building, and the classes as shown by the different coloring and characters set forth in the reference."

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[47] *See* William Perris, *Maps of the City of New York* (1857), https://digitalcollections.nypl.org/items/06fd4630-c603-012f-17f8-58d385a7bc34.

99 U.S. at 675. *See* Appendix B hereto at 2. The buildings on the maps "were so marked with arbitrary coloring and signs, explained by a reference or key, that an insurer could see at a glance what were the general characteristics of the different buildings within the territory delineated, and many other details of construction and occupancy necessary for his information when taking risks." *Id.*

The defendant in *Perris* copied and used the key shown on page 20, above, to prepare an original series of maps of the city of Philadelphia which showed the characteristics of the mapped properties. *See id.* ("[H]e used substantially the same system of coloring and signs, and consequently substantially the same key that had been adopted by the complainants."). The "coloring and signs" at issue in *Perris* performed the same type of identification function as do the Java declarations disclosed in J2SE: both identify artifacts in accordance with a formal system of notation.

Consistent with the principle later codified in current 17 U.S.C. § 102(b), this Court held that the copyright in Mr. Perris' maps did not extend to "their system of arbitrary signs and their key" and, as a consequence, the defendant's copying and use of "substantially the same system of coloring and signs" did not constitute copyright infringement. *Id.* at 675-76. The Court provided two distinct reasons for this conclusion, both of which remain valid copyright law doctrine and warrant reversal here.

First, the Court held that the defendant was not an infringer, even though he had copied and used the same "key" and had identified property characteristics by means of the same system of "arbitrary signs" as

did the complainants' maps. *Id.* at 676. This was so, the Court reasoned, because the two sets of maps were of different cities and thus did not "convey the same information." *Id.*

Second, the Court held that the copyright in the complainants' maps did not extend to the system of arbitrary symbols that the maps and their key embodied:

> [W]e think it has never been supposed that a simple copyright of the map gave the publisher an exclusive right to the use upon other maps of the particular signs and key which he saw fit to adopt for the purposes of his delineations. That, however, is what the complainants seek to accomplish in this case.

Id.

Perris informs how 17 U.S.C. § 102(b) should be construed and applied in this case.[48] Just as the accused maps in *Perris* depicted different physical buildings than did the maps in which the *Perris* complainants held copyrights, so here, the accused Android software libraries comprise different, independently created implementing code than do corresponding J2SE libraries as implemented by Respondent in its

[48] At least one commentator has noted the parallels between *Perris* and this case. *See* Zvi S. Rosen, *How* Perris v. Hexamer *Was Lost in the Shadow of* Baker v. Selden, 68 Syracuse L. Rev. 231, 251 (2018) ("The analogy to *Perris* is straightforward—in both cases there is a class of defined functions (a table with definitions of map symbols in *Perris*), which are then used as part of a copyrighted work where no infringement is alleged (the programming language in *Oracle*, and the city maps in *Perris*.)" (footnote omitted)).

proprietary Oracle Java product. The implementing code in the parties' respective software libraries is different in the same way that the buildings represented in Perris's and Hexamer's maps were different: the implementing code entities "do not convey the same information" (99 U.S. at 676) and this is so notwithstanding that Petitioner, like the *Perris* defendant, may have used identical terminology (i.e., "declarations"; *see* note 46 *supra*) to identify Android entities that perform the same functions as do corresponding entities disclosed in J2SE.

Equally importantly, like the symbolic signs at issue in *Perris*, declarations like the one reproduced on page 19, *supra*, are embodiments of a system for denoting the characteristics of entities; and as *Perris* also demonstrates, a system of notation does not cease to be a system merely because alternative notation systems might be devised.[49] *Cf. Brown Instrument Co. v. Warner*, 161 F.2d 910, 911 (D.C. Cir. 1947) (ruled paper disks adapted to record data from particular temperature measuring machines held uncopyrightable); *Taylor Instrument Cos. v. Fawley-Brost Co.*, 139 F.2d 98, 99-100 (7th Cir. 1943) (same).

The operation of 17 U.S.C. § 102(b) is independent of the "fair use" limitation on copyright prescribed in 17 U.S.C. § 107, and the Court should decide this case

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[49] Respondent has wrongly asserted that software interfaces are copyrightable as so-called "structure, sequence, and organization" ("SSO") elements. The analogy is flawed because, as indicated in the text, software interfaces embody formal systems for identifying entities and, as such, are excluded from copyright protection under 17 U.S.C. § 102(b).

on the basis of § 102(b). Rights to use embodied systems and methods of operation are of little practical value if IBM, Red Hat, and other developers can exercise them only by braving the risk of a trial of highly fact-bound inquiries into, among other things, "the effect of the use upon the potential market for or value of the copyrighted work." 17 U.S.C. § 107(4); *cf. United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942) ("A zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field.").

For all of these reasons, the Court should hold that the declarations in J2SE embody a "system" or "method of operation" within the plain and common-law meaning of those terms in 17 U.S.C. § 102(b); and for that reason, any copyright Respondent has in J2SE does not confer on Respondent any right to exclude use of those declarations. In holding the contrary, the decision below is erroneous and should be reversed on that basis.

III. THE DECISION BELOW FAILED TO APPLY THIS COURT'S PRECEDENT EXCLUDING CATEGORIES OF SUBJECT MATTER FROM COPYRIGHT PROTECTION, AS CODIFIED IN 17 U.S.C. § 102(b).

At the time of § 102(b)'s enactment in October 1976, it was well-known that an original work of authorship might include non-copyrightable elements.[50]

The Copyright Act of 1909 limited the scope of copyright protection to "the copyrightable component parts of the work copyrighted."[51] The Copyright Act of 1976 retained and expanded this limitation on copyright protection in 17 U.S.C. § 102(b), which provides:

> In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

Although Congress has amended the Copyright Act on a number of occasions since 1976, the above-

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[50] *See, e.g.*, *Banks v. Manchester*, 128 U.S. 244, 253-54 (1888) (copyright in volume of law reports did not confer any right to exclude use of syllabi, headnotes, or opinions prepared by state court judges); *Baker v. Selden*, 101 U.S. 99, 104 (1880) (copyright in book did not confer any right to exclude use of "a peculiar system of book-keeping" or associated "ruled lines and headings" for recording journal, ledger, and trial balance entries); *Perris*, 99 U.S. at 675-76 (copyright in map did not confer any right to exclude use of a "system of coloring and signs" for identifying characteristics of real properties).

[51] Act of Mar. 4, 1909, ch. 320, § 3, 35 Stat. 1075, 1076.

quoted text has remained unchanged for forty-three years. Several aspects of 17 U.S.C. § 102(b) are noteworthy:

First, although the word "system" in § 102(b) is not statutorily defined, it was used in *Perris* and *Baker*, and in subsequent cases,[52] to identify a category of subject matter that is, by its nature, excluded from the protection that a copyright confers on a work's author. "It is a settled principle of interpretation that, absent other indication, 'Congress intends to incorporate the well-settled meaning of the common-law terms it uses.'"[53]

Second, the plain meaning of "system" at the time of the enactment of § 102(b) included: "a particular classification, notation, or other formal arrangement or scheme."[54] This definition easily encompasses a "system of arbitrary signs" for identifying characteristics of buildings (*Perris*, 99 U.S. at 676); a "system of

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[52] *See, e.g.*, *Brief English Sys., Inc. v. Owen*, 48 F.2d 555, 556-57 (2d Cir. 1931) (copyright did not extend to "system of shorthand"); *Aldrich v. Remington Rand, Inc.*, 52 F. Supp. 732, 733 (N.D. Tex. 1942) (copyright did not extend to "system of property revaluation"); *Griggs v. Perrin*, 49 F. 15, 15 (C.C.N.D.N.Y. 1892) (copyright did not extend to "system of phonetic writing").

[53] *Sekhar v. United States*, 570 U.S. 729, 732 (2013) (quoting *Neder v. United States*, 527 US. 1, 23 (1999)); *see also* Antonin Scalia & Bryan A. Garner, *Reading Law: The Interpretation of Legal Texts* 320 (2012) ("A statute that uses a common-law term, without defining it, adopts its common-law meaning.").

[54] *Webster's Third New Int'l Dictionary* (1961); *see* Scalia & Garner, *supra* note 53, at 78 ("Fixed-Meaning Canon"; "Words must be given the meaning they had when the text was adopted.").

book-keeping" (*Baker*, 101 U.S. at 104-07), and a system of notation for identifying characteristics of complex software entities.

Third, the history of § 102(b) indicates that its eight nouns were expressly and specifically designed to limit the scope of copyright protection for computer programs in accordance with settled law.[55] This legislative history is consistent with both the plain and the common-law meaning of the exclusion terms in § 102(b).

Fourth, several of the terms in § 102(b), including "process," "system," "method of operation," "principle," and "discovery," are drawn from or refer to the field of patent law.[56] The existence of a parallel and more specific regime of intellectual property protection supports a broad construction of the terms in 17 U.S.C. § 102(b).[57]

Fifth, § 102(b) excludes from copyright protection any "system" or "method of operation" that may be "described, explained, illustrated, *or embodied in* such work" (emphasis added). Section 102(b) thus applies,

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[55] *See* Pamela Samuelson, *Why Copyright Law Excludes Systems and Processes From the Scope of Its Protection*, 85 Tex. L. Rev. 1921, 1949-51 (2007) (describing emergence of terms in what became § 102(b) following congressional hearing testimony urging limits on copyright protection for computer programs).

[56] *See, e.g.*, 35 U.S.C. § 100 (1976) ("invention or discovery"; "process, art or method").

[57] *Cf. Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23, 37 (2003) (construing federal trademark statutory term "origin" in a manner that preserved public domain created by federal copyright law).

not merely to *external* systems or methods that a work may describe, explain, or illustrate (for example, a method of preparing a meal), but equally to systems or methods that may be "embodied in" the work itself.[58] The "embodied in" provision of § 102(b) is consistent with *Perris*, in which this Court held that the copyright in an otherwise original map did not extend to the "system of coloring and signs" for identifying characteristics of buildings that the map incorporated, shown on page 20 *supra* and in Appendices A and B to this brief, *post*.[59] The "embodied in" provision of § 102(b) is also consistent with *Baker*, in which this Court held that the copyright in an otherwise original book did not extend to "a peculiar system of bookkeeping" or associated "ruled lines and headings" for recording journal, ledger, and trial balance entries.[60]

Sixth, the Copyright Act prescribes specific rights in "computer program[s]," 17 U.S.C. §§ 109(b), 117, and limits those rights in § 102(b). Just as there is a "federal right to 'copy and to use' expired copyrights,"[61] § 102(b) similarly creates a federal right to copy and to use subject matter that it regulates and leaves unprotected.[62]

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[58] *Cf. Quanta Comput., Inc. v. LG Elecs., Inc.*, 553 U.S. 617, 628 (2008) ("methods nonetheless may be 'embodied' in a product").

[59] 99 U.S. at 675-76.

[60] 101 U.S. at 104.

[61] *Dastar*, 539 U.S. at 34 (quoting *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 165 (1989)).

[62] *Cf. Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 231 (1964) ("An unpatentable article, like an article on which the patent has

Seventh, although § 102(b) excludes "any idea" from the scope of copyright protection, the scope of § 102(b) is not limited to subject matter that can be characterized as "idea[s]." Section 102(b) excludes seven other categories of subject matter from copyright protection, including "system" and "method of operation." These other § 102(b) exclusions are not rightly treated as surplusage or redundant of "idea[s]." *See, e.g.*, Scalia & Garner, *supra* note 53, at 174 (the "Surplusage Canon"). And even if, as the decision below suggests, the term "idea" could be narrowly construed as excluding conceptions that are capable of expression in many different ways (750 F.3d at 1367), the terms "system" and "method of operation" are clearly much broader than that, and should be broadly construed in accordance with their plain and common-law meanings.

CONCLUSION

IBM and Red Hat fully support copyright protection for computer programs. IBM and Red Hat rely on copyright protection in their own businesses. But it is one thing for copyright to protect portions of computer programs that implement algorithms for performing computational tasks, and quite another for copyright to protect terminology or nomenclature for denoting entities in accordance with a formal system of notation. In purporting to extend copyright protection to

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expired, is in the public domain and may be made and sold by whoever chooses to do so."); *Mazer v. Stein*, 347 U.S. 201, 215 n.33 (1954) (noting appellate case law holding that "the Mechanical Patent Law and Copyright Laws are mutually exclusive"); *see also Feist*, 499 U.S. at 360 (stating, "facts are never original, § 102(b)").

the latter, the decision below contravenes more than sixty years of settled expectations in the software industry and calls into question a fundamental aspect of software innovation and development.

Software interfaces provide for compatibility between software and hardware components in a computer system; they enable remote elements in a network to exchange information with one another; they comprise formal systems for denoting complex software entities; and they are wholly inappropriate for copyright protection.

Under the plain text of 17 U.S.C. § 102(b), systems and methods for denoting the characteristics of entities or artifacts, including software interfaces, are expressly not subject to copyright protection; and use of such systems and methods cannot be deemed infringement even though, when used, identical declarations result for calling differently implemented software entities having identical functions. The decision below upsets the careful balance of public and private rights that 17 U.S.C. §§ 102(a) and (b) together prescribe.

The Federal Circuit's unduly narrow construction of 17 U.S.C. § 102(b) is harmful to progress, competition, and innovation in the field of software development.

IBM and Red Hat urge the Court to reverse the decision below on the basis that 17 U.S.C. § 102(b) excludes software interfaces from copyright protection.

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January 13, 2020

APPENDIX

APPENDIX A — KEY FOR MAPS OF THE CITY OF NEW YORK BY WILLIAM PERRIS, CIVIL ENGINEER AND SURVEYOR, THIRD EDITION 1857

Reference.

Brick or Stone Stores.

- First class
- Second class
- Third class

Brick or Stone dwellings

- First class (Slate or metal roof & coped)
- Second class (Slate or metal roof not coped
- Third class (Slate & shingle roof)
- Fourth class (Shingle roof)

With Stores under

- First class (Slate or metal roof & coped
- Second class (Slate or metal roof not coped
- Third class (Slate & shingle roof)
- Fourth class (Shingle roof)

- Framed dwellings
- Framed dwellings with stores under

SPECIALLY HAZARDOUS

Brick FIRST CLASS Framed

- Bakers
- Boat builders
- Breweries
- Brush manufactories
- Comb makers
- Copper Smith with forges
- Dyers
- Floor cloth manufactories
- Hat manufactories
- Malt houses
- Oil manufactories
- Oil cloth manufactories
- Private Stables
- Tobacco manufactories
- Type and Stereotype founders
- Wheelwrights

Brick SECOND CLASS Framed

- Book binders
- Brass founders
- Couch makers
- Cotton presses and Cotton mills
- Iron founders
- Livery Stables
- Paper mills
- Printers of books and Job printers

Brick THIRD CLASS Framed

- Blind and Sash makers
- Bleaching works
- Cabinet makers' work shops
- Carpenters shops
- Candle makers
- Chair makers' work shops
- Distillers

THIRD CLASS CONTINUED

- Gas manufactories
- Flour mills
- Ink makers (Printers ink)
- India rubber or gutta percha manufactories
- Lamp black & ivory black manufactories
- Looking glass and Picture frame makers
- Musical instrument makers
- Omnibus stables
- Organ makers
- Piano forte makers
- Rectifiers of liquors by fire heat
- Soap makers
- Tallow melters or chandlers
- Wool mills

Brick FOURTH CLASS Framed

- Brimstone works
- Camphene or spirit gas manufactories
- Coffee and spice mills
- Chemical laboratories
- Drug and spice mills
- Fire work manufactories
- Match manufactories
- Planing, groving or moulding mills
- Rope and Cordage makers
- Saw mills
- Sugar refineries
- Tar boiling houses
- Turpentine distilleries
- Varnish makers

- Extensions with skylight
- Skylights lighting more than the top floor
- Skylights lighting the top floor only
- Boilers of steam engines
- Smoke houses
- Retorts
- Outbuildings
- Buildings communicating

Skylights less than 3 feet square

generally omitted

APPENDIX B — MAPS OF THE CITY OF NEW YORK BY WILLIAM PERRIS, CIVIL ENGINEER AND SURVEYOR, THIRD EDITION 1857

MAPS OF THE CITY OF NEW-YORK

William Perris

CIVIL ENGINEER AND SURVEYOR

THIRD EDITION

1857. Vol. I

Reference.

Brick or Stone Stores.

- First class
- Second class
- Third class

Brick or Stone dwellings

- First class (Slate or metal roof & coped)
- Second class (Slate or metal roof not coped
- Third class (Slate & shingle roof)
- Fourth class (Shingle roof)

With Stores under

- First class (Slate or metal roof & coped
- Second class (Slate or metal roof not coped
- Third class (Slate & shingle roof)
- Fourth class (Shingle roof)

- Framed dwellings
- Framed dwellings with stores under

SPECIALLY HAZARDOUS

Brick FIRST CLASS Framed

- Bakers
- Boat builders
- Brewers
- Brush manufactories
- Comb makers
- Copper Smith with forges
- Dyers
- Floor cloth manufactories
- Hat manufactories
- Malt houses
- Oil manufactories
- Oil cloth manufactories
- Private Stables
- Tobacco manufactories
- Type and Stereotype founders
- Wheelwrights

Brick SECOND CLASS Framed

- Book binders
- Brass founders
- Coach makers
- Cotton presses and Cotton mills
- Iron founders
- Livery Stables
- Paper mills
- Printers of books and Job printers

Brick THIRD CLASS Framed

- Blind and Sash makers
- Bleaching works
- Cabinet makers work shops
- Carpenters shops
- Candle makers
- Chair makers work shops
- Distillers

THIRD CLASS CONTINUED

- Gas manufactories
- Flour mills
- Ink makers (Printers ink)
- India rubber or gutta percha manufactories
- Lamp black & ivory black manufactories
- Looking glass and Picture frame makers
- Musical instrument makers
- Omnibus stables
- Organ makers
- Piano forte makers
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- Soap makers
- Tallow melters or chandlers
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Brick FOURTH CLASS Framed

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- Chemical laboratories
- Drug and spice mills
- Fire work manufactories
- Match manufactories
- Planing, grooving or moulding mills
- Rope and Cordage makers
- Saw mills
- Sugar refineries
- Tar boiling houses
- Turpentine distilleries
- Varnish makers

- Extensions with skylight
- Sky lights lighting more than the top floor
- Skylights lighting the top floor only
- Boilers of steam engines
- Smoke houses
- Retorts
- Outbuildings
- Buildings communicating

Skylights less than 3 feet square generally omitted.

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14 Wall Street, Room 5, (Tradesmen's Insurance Co.)
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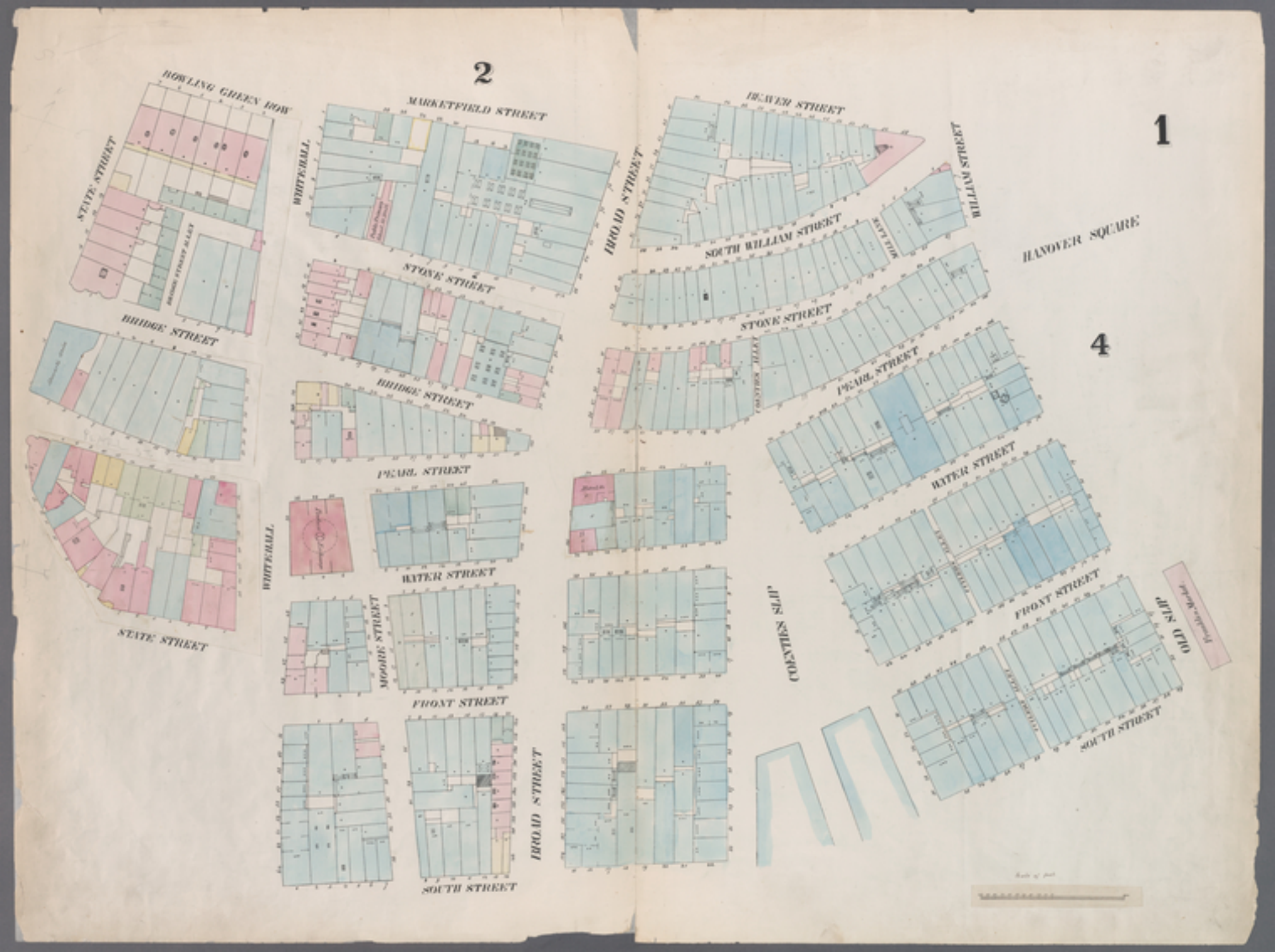
2
1
4
BOWLING GREEN ROW
STATE STREET
BROAD STREET PLACE
MARKETFIELD STREET
WHITEHALL
BROAD STREET
BRIDGE STREET
STONE STREET
PEARL STREET
WATER STREET
MOORE STREET
FRONT STREET
SOUTH STREET
BEAVER STREET
SOUTH WILLIAM STREET
HANOVER SQUARE
COENTIES SLIP
OLD SLIP