

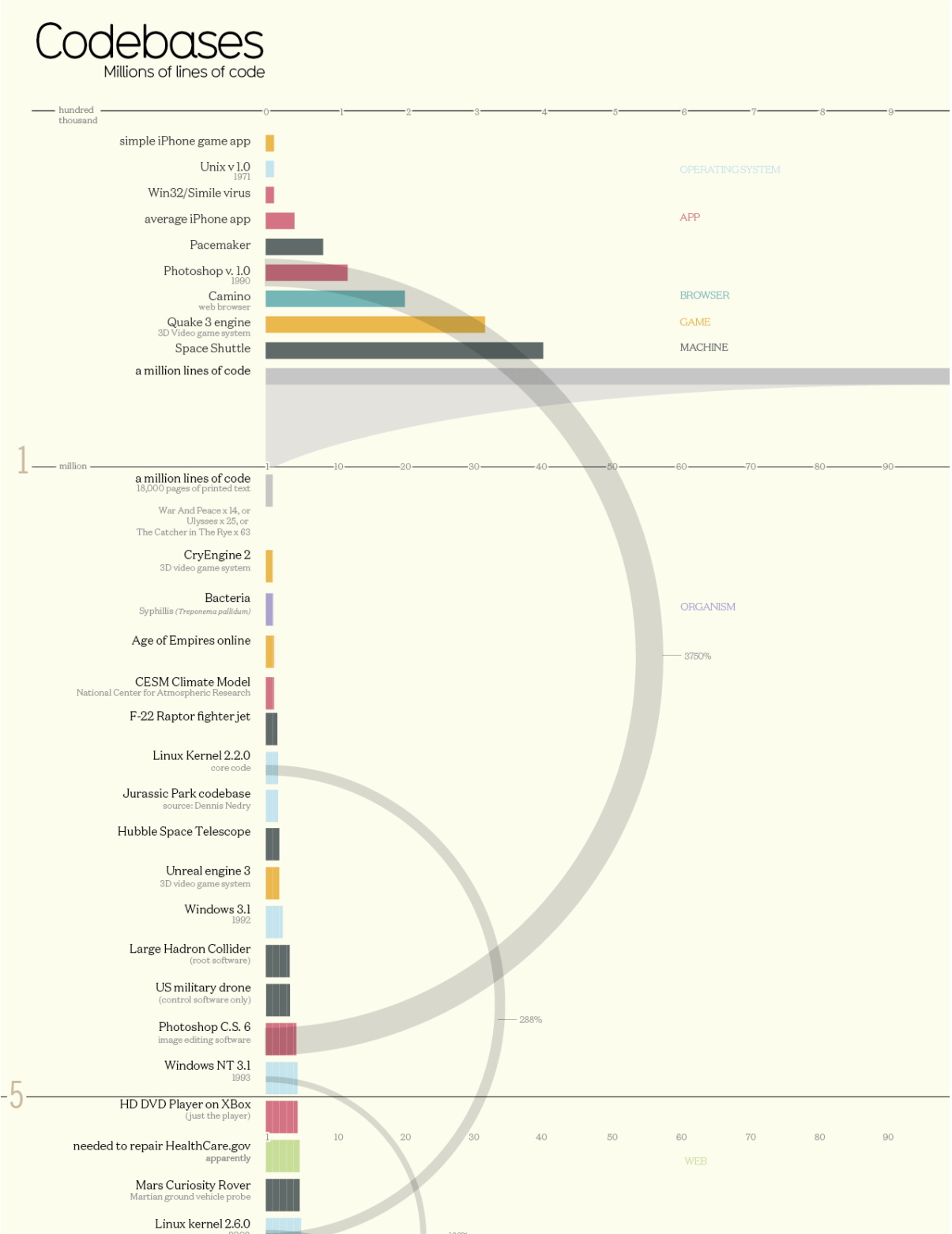
TECHNOLOGY

How Many Millions of Lines of Code Does It Take?

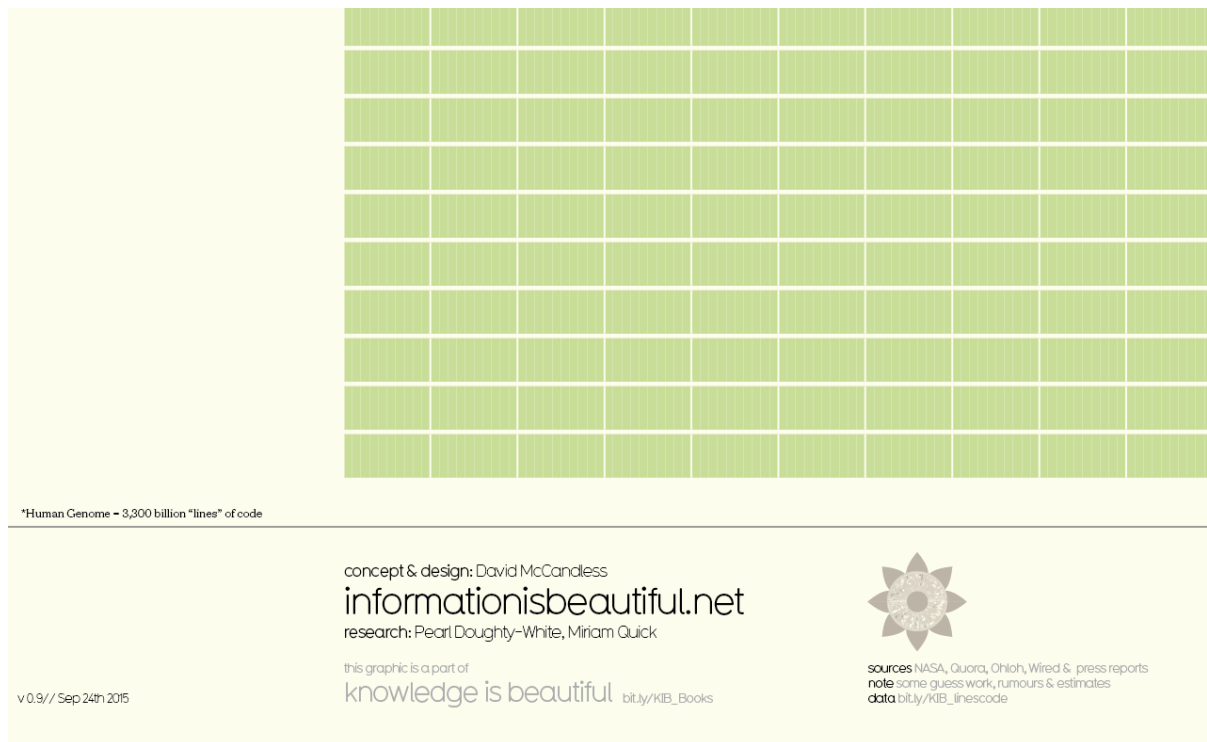


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By Jeff Desjardins







How Many Millions of Lines of Code Does It Take?

Today's data visualization comes from David McCandless from *Information is Beautiful*. Buy their awesome book called *Knowledge is Beautiful* – we own the physical version, and it's full of great data visualizations.

How many millions of lines of code does it take to make the modern program, web service, car, or airplane possible?

The range is extraordinary: the average iPhone app has less than 50,000 lines of code, while Google's entire code base is two billion lines for all services. And interestingly, the code behind machines such as fighter jets, popular video game engines, and even the Large Hadron Collider fall somewhere in between these two extremes.

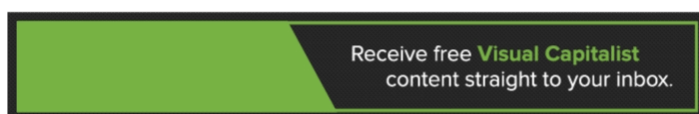
Increasing Complexity

A million lines of code, if printed, would be about 18,000 pages of text. That's 14x the length of *War and Peace*.

It's more than what was needed to run old technologies like the Space Shuttle, a pacemaker, or even the game engine of Quake 3 – but it's not enough to be the driving force behind the modern software that's used in everyday life today.

- The control software to run a U.S. military drone uses 3.5 million lines of code.
- A Boeing 787 has 6.5 million lines behind its avionics and online support systems.
- Google Chrome (browser) runs on 6.7 million lines of code (upper estimate).
- A Chevy Volt uses 10 million lines.
- The Android operating system runs on 12-15 million lines.
- The Large Hadron Collider uses 50 million lines.
- Not including backend code, Facebook runs on 62 million lines of code.
- With the advent of sophisticated, cloud-connected infotainment systems, the car software in a modern vehicle apparently uses 100 million lines of code. This is according to Wired magazine.
- All Google services combine for a whopping 2 billion lines.

Applying the math above – that means it would take 36,000,000 pages to “print out” all of the code behind all Google services. That would be a stack of paper 2.2 mi (3.6 km) high!



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