



# Software Engineer

## **JOB OUTLOOK**<sup>3,4</sup>

Software engineers are in very high demand, and the industry is projected to grow much more quickly than most other industries, as more of our lives require computers and mobile devices. In 2018, more than 1.3 million people held software engineering jobs. The need for these skills is so widespread that software engineers can really choose just about any field to work in: technology, healthcare, energy, government, finance, education, and more. That means that they have the flexibility to find the type of problems they want to solve and the work environment they want to be in every day. Software engineers work as both employees and as contractors, and in both cases the job is typically very deadline-driven and may require long hours.

## **SALARY RANGE**<sup>5,6</sup>

\$79,000–\$140,000

## **WHO ARE THEY?**<sup>1,2,3</sup>

Software engineers are computer scientists who apply engineering principles to create everything from computer operating systems to your favorite apps. The software they create powers your computer and many of the electronic devices you use every day. Software engineers are experts in programming languages and can apply that knowledge to a wide range of opportunities—including video game development and the creation of applications that you use to check the weather, keep up with social media, order food delivery, and so much more. At Microsoft, these are the professionals who design games like Minecraft! If you love thinking up new ideas and finding ways to bring them to life, you might want to consider a career as a software engineer.

## **WHAT DO THEY DO?**<sup>1,2,3</sup>

Software engineers create all the systems and applications that run on computers and other devices. They do this by using advanced mathematical analysis and principles of both computer science and engineering. They start by analyzing a problem or need, designing a solution, and then thoroughly testing that solution. This often involves creating or utilizing an *algorithm*, or a set of rules for a computer to follow in completing calculations or other operations. This requires creativity and in some cases artistic ability, critical thinking and problem-solving, a strong attention to detail, and a methodical process. Software engineers often work as part of a team or even directly with clients, so strong communication skills are also necessary.



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## EDUCATION/ TRAINING

- Bachelor's degree in computer science, mathematics, or a related STEM field
- Master's degree in computer science, mathematics, or a related STEM field
- Internships and/or apprenticeships
- Experience with programming languages like C++ and python preferred

## HOW DO I BECOME ONE?<sup>3,4</sup>

Students who want to become software engineers should commit to taking the appropriate courses and developing the necessary skills starting in high school. Learning to code and learning programming languages in high school will help prepare students and help them understand whether they would enjoy a career in software engineering. Students should also take advanced mathematics courses, engineering, and computer science courses in high school, where available. If students are interested in turning a software engineering career into one in video game or app development, they may also want to consider graphic design courses. This career will likely require a bachelor's degree in computer science, mathematics, or a related field and may require a master's degree.

<sup>1</sup> "Software Engineer II." Microsoft. <https://careers.microsoft.com/us/en/job/724532/Software-Engineer-II>.

<sup>2</sup> "Senior Systems Designer." Microsoft. <https://careers.microsoft.com/us/en/job/693917/Senior-Systems-Designer>.

<sup>3</sup> "Software Engineer." Career Explorer. <https://www.careerexplorer.com/careers/software-engineer>.

<sup>4</sup> "Occupational Outlook Handbook." U.S. Bureau of Labor Statistics. <https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>.

<sup>5</sup> "Occupational Employment Statistics." U.S. Bureau of Labor Statistics. <https://www.bls.gov/oes/2018/may/oes151133.htm>.

<sup>6</sup> "Occupational Employment Statistics." U.S. Bureau of Labor Statistics. <https://www.bls.gov/oes/2018/may/oes151132.htm>.