

INFORMATION TECHNOLOGY AND PROGRAMMING LANGUAGE

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ANNOTATION

In this digital age, almost every area of our lives and businesses are controlled by Computer code. Consequently, programming skills are now in high demand across industries-not only for those in software development but also for almost every career role. According to a study conducted in the United States, over 7 million out of 26 million online job postings were reported to have required programming skills. In this study, we identified and ranked the 'most-used' programming languages for each of the 23 different job roles in IT teams. Knowing the 'most-used' programming languages for a given role will help stakeholders plan adequately. Our results show that JavaScript was the overall most-used language, followed by HTML/CSS and then SQL. However, in terms of specific roles, HTML/CSS was the most-used language for Marketing/Sales, JavaScript for those in software development, Python for Data Scientists, Academic researchers and Scientists. SQL for Database Administrators, Data Engineers and Data Analysts. The outcome of this study can be used by relevant stakeholders to make decisions regarding careers, professional development and curriculum designs.

Our results show that JavaScript was the overall most-used language, followed by HTML/CSS and then SQL. This finding aligns with the existing literature and the preliminary analysis. In terms of specific roles, HTML/CSS was the most-used language for Marketing/Sales, JavaScript for those in software development, Python for Data Scientists, Academic researchers and Scientists. SQL for Database Administrators, Data Engineers and Data Analysts. With the recent advances in technology and data usage, having programming skills will likely increase the chances of a candidate getting an IT job. JavaScript is the

programming, scripting, and Markup language that most respondents have used extensively. This can be due to the flexibility of JavaScript, i.e., its ability to unify all of the web development around single programming rather than using a different language for the client-side and another for the server-side. According to, JavaScript is responsible for more than one-third of the popular applications on GitHub; the following five languages (Ruby, Objective-C, Python, Java, and PHP) are responsible for another third of the popular applications. Further, this finding can be connected to the nature of wide usage of the internet for daily communication and information sharing where most IT solutions are web-based. Hence, a flexible approach for developing the web can create more demand. Consequently, a huge opportunity to develop young students in JavaScript programming skill can be explored at the higher education level where educators can create more courses to facilitate the skill. Besides, HTML/CSS was rated very highly as a top programming language next to JavaScript on several occasions. This is undoubtedly due to its extensive use in designing and developing web interfaces and other presentation materials. Python, on the other hand, has also gained popularity in the scientific domain. It is frequently used for high-performance scientific applications and is widely used by scientists, academic researchers, and data engineers because it performs well and is easy to write. As shown in Figure 3, several developers also showed interest in using python more than C++ and C, which are older programming languages. Although C and C++ are relatively old languages, they are still relevant in developing embedded applications and banking software. We also observed that SQL consistently ranked in the top three for 20 of the 23 roles, and it was unanimously selected as the most used language by all the IT roles belonging to the Data category. This lends credence to the importance of data management in almost every aspect of our daily tasks.

5 Conclusion

This study analysed the SODS data for the year 2020. The data set contains 23 different IT roles. The majority of the respondents work in IT roles that fall under the software development category. Specifically, full-stack

developers and backend developers are the most frequent. We then constructed a pool of the used technologies provided by the respondents. By computing the list of the ‘most-used’ technologies for a given IT role, we were able to infer the ‘most-used’ IT technical skills for that particular role. According to our findings, JavaScript was the most-used programming language for 16 of the 23 roles surveyed, especially those in the software development job related field. HTML/CSS was reported as the most-used programming language for people working in marketing and as the second-most used programming language for 11 other roles. The most-used programming language for database administrator, data engineer and data analyst was SQL and was cited as one of the three most-used languages for 17 other roles. Further, Python was considered the most-used language for data science professionals, academic researchers and scientists. The study is limited in that the data analysed were limited to one year (i.e. 2020), which limits the extent that this study can be generalised.

It would be good to examine the annual trends of IT job roles and skillsets across multiple years to provide broader decision-making insights. The future direction of this study could seek to extend the scope and context by collecting and analysing data from educational settings and scholarly articles. In addition, future work should consider an extensive analysis of trends in the research domain.

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