CodeSignal

2023 State of Engineer Hiring Survey

Each year, hundreds of thousands of candidates take an assessment on CodeSignal. We surveyed these candidates to get a pulse on engineer hiring today.

Here's what we learned.

Overview

The State of Engineer Hiring Survey provides original insights on industry-wide trends in technical hiring today—including top technologies engineers use, in-demand specialities, current salary ranges for tech roles, and the impact of skills-based hiring practices.

Here are the most eye-opening findings from our 2023 survey:

- **Python 3** dominates as the most popular coding language across technical roles.
- **It pays to have skills.** Candidates who score higher on a CodeSignal assessment earn more in their jobs.
- **Back-end developers** have the highest median salary of any technical role.
- **Newer coding languages** like Python 3, TypeScript, React, and Bash are the highest-paying.
- **Experience**, not a college degree, matters for predicting coding skill—and salary.
- **Candidates prefer CodeSignal** assessments to other types of pre-hire assessments.

Report sections

Popular coding languages today

78% of respondents listed Python 3 as a coding language they use frequently. Python 3 also ranked as the top coding language for all tech roles except for one, front-end development.

All respondents

n=2,696

Coding Language	Percentage
Python 3	78.2%
Java	61.6%
JavaScript/NodeJS	39.8%
C++	37.3%
C	24.5%

Coding Language	Percentage
MySQL	24.2%
React	17.9%
TypeScript	16.7%
Python2	12.1%
Bash	9.4%

Employed in any engineering role

n=1,213

Coding Language	Percentage
Python 3	74.2%
Java	58.5%
JavaScript/NodeJS	41.6%
C++	32.5%
MySQL	24.0%

Coding Language	Percentage
TypeScript	20.5%
C	19.7%
React	19.0%
Python 2	12.7%
C#	12.1%

Back-End Developers

n=439

Coding Language	Percentage
Python 3	75.1%
Java	68.4%
C++	37.8%
JavaScript/NodeJS	29.1%
MySQL	19.7%

Coding Language	Percentage
C	17.6%
TypeScript	13.7%
React	13.0%
C#	12.6%
Go	11.9%

Full Stack Developers

n=340

Coding Language	Percentage
Python 3	73.0%
JavaScript/NodeJS	63.8%
Java	61.7%
TypeScript	35.6%
React	32.1%

Coding Language	Percentage
MySQL	29.9%
C++	27.3%
C	21.4%
C#	13.6%
Python 2	12.8%

Front-End Developers

n=82

Coding Language	Percentage
JavaScript/NodeJS	82.9%
Java	51.2%
Python 3	48.8%
TypeScript	41.5%
React	37.8%

Coding Language	Percentage
C++	19.5%
C	17.1%
MySQL	13.4%
Python 2	11.0%
C#	8.5%

Data Scientists

n=90

Coding Language	Percentage
Python 3	93.3%
MySQL	37.1%
Java	36.0%
C++	34.8%
R	30.3%

Coding Language	Percentage
Python 2	25.8%
C	23.6%
JavaScript/NodeJS	21.3%
Bash	7.9%
React	7.9%

Data Engineers

n=53

Coding Language	Percentage
Python 3	92.5%
Java	49.1%
MySQL	41.5%
C++	24.5%
Bash	22.6%

Coding Language	Percentage
C	22.6%
JavaScript/NodeJS	20.8%
Python 2	20.8%
R	17.0%
Scala	17.0%

***Question:** Which coding languages do you frequently use? Check all that apply.

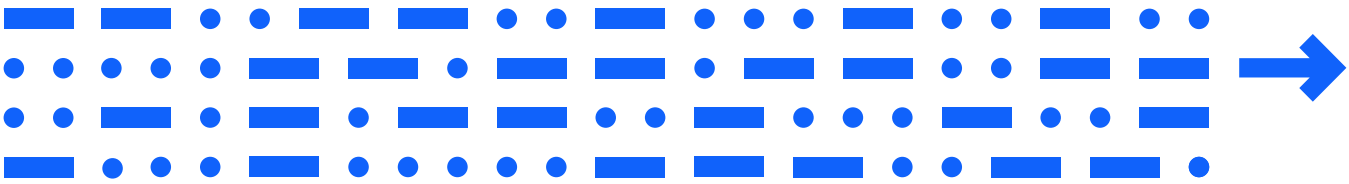
Engineering salaries across top tech roles

When we looked at how respondents scored on their CodeSignal pre-hire assessment, we found that **higher coding scores were associated with higher salaries.** On average, for every 20 point gain on the General Coding Framework assessment, a candidate's potential annual salary in software engineering and related roles increases by $3,500.

Back-end engineers are the highest-paid of any tech role with a median annual salary of $120,000 - $139,999. And respondents who use **Python 3, TypeScript, React, or Bash** reported the highest median salaries.

Coding score and salary

For every **20 points** on the General Coding Framework assessment that a candidate gains by improving their skills, their potential annual salary in software engineering and related roles increases by $3,500 on average.



Engineering salaries across all roles

n=944

Annual Salary (USD)	Percentage
less than $40,000	4.1%
$40,000 - $59,999	4.1%
$60,000 - $79,999	7.3%
$80,000 - $99,999	12.8%
$100,000 - $119,999	14.3%
$120,000 - $139,999	13.8%
$140,000 - $159,999	9.2%
$160,000 - $179,999	4.6%
$180,000 - $199,999	3.9%
$200,000 - $219,999	3.1%
$220,000 - $249,999	1.3%
$250,000 - $279,999	0.5%
$300,000 or more	0.9%
Not applicable (paid an hourly rate/wage)	20.0%

Highest-paying tech roles

By median annual salary

1. **Back End Developer:**
   $120,000 - $139,999

2. **Full Stack Developer & Front-End Developer:**
   $100,000 - $119,999

3. **Data Scientist:**
   ~ $100,000

Highest-paying coding languages

By median annual salary

1. **Python 3, TypeScript, React, Bash:**
   $120,000 - $139,999

2. **Java, Javascript/NodeJS, C, C++, MySQL:**
   $100,000 - $119,999

What this means: For respondents employed in an engineering role, using newer coding languages like Python 3, TypeScript, and React paid more than knowing older languages like Java, C, and C++. However, what coding language a software engineer uses isn't the best predictor of their salary—their level of coding skill is.

***Question:** If you are paid a salary, what is your current annualized salary (in US dollars)?**

Experience versus education: which matters more?

When we look at the data, the answer is clear: **experience** matters more than education. Years of coding experience is a strong predictor of coding skills, but education level is not.

> We also found that for **each additional year** of coding experience a software engineer has, their salary increases by $5,250 on average.

Predictors of coding skill

In addition to learning what coding languages software engineers and developers are using, what technical roles they hold, and how much they're paid, we wanted to know more about the candidates who have strong coding skills—measured by scoring highly on a CodeSignal assessment. This meant asking questions like:

- Do candidates with higher levels of education perform better on CodeSignal assessments?
- Do candidates with more years of coding experience, formal and informal, do better on CodeSignal assessments?
- And which matters more for accurately predicting a candidate's coding skills: education or experience?

When we analyzed the relationship between education level and a candidate's coding score, we did not find a relationship. We did, however, find a positive correlation between a candidate's years of coding experience (from any source—professional, school, or hobby) and their coding score ($p < 0.001$).

What this means: Having a college degree doesn't make a difference in whether candidates have strong coding skills, but coding experience does.

Coding experience and salary

Software engineers and developers with more coding experience have stronger coding skills. But we also wanted to know:

- Do candidates with more experience make more money?
- And if so, how much more?

We found that for each additional year of coding experience a respondent has, their salary increases by $5,250 on average.

***Question:** What is your current highest degree? How many years of experience do you have coding (can be from any source - work, school, hobby, etc.)?

How candidates feel about the tech hiring process

We asked respondents how they felt about a range of tech hiring activities, including various types of technical assessments, take-home assignments, and interviews.

What we found: Candidates prefer CodeSignal assessments to other types of pre-hire assessments.

Candidate perceptions of tech hiring experiences

Hiring Experience	Average (Mean)
Completing take-home coding challenges	3.47
Completing timed coding assessments (in general)	3.37
Completing CodeSignal assessments	3.41
Completing coding interviews	3.58
Completing behavioral interviews	3.78
Take-home personality/behavioral assessments	3.25

When we compared respondents' perceptions of different tech hiring activities, we found that candidates view CodeSignal assessments more favorably than they do take-home personality or behavioral assessments ($p < 0.001$), which are often seen as less job-relevant and less face valid by candidates.

We also found that candidates view CodeSignal assessments more favorably than timed coding assessments in general ($p = 0.034$). This holds true when looking at data broken down by gender, as well—both women and men prefer CodeSignal assessments to timed coding assessments in general.

Hiring Experience	Average (Women)	Average (Men)
Completing timed coding assessments (in general)	3.27	3.42
Completing CodeSignal assessments	3.33	3.45

***Question: Please indicate your impressions of the following hiring experiences (1-5 scale, one being low and five being high).**

Conclusion

Our 2023 survey offered a range of insights on popular coding languages today, salary ranges for top tech roles, how education and experience impact coding skills, and how candidates feel about the technical hiring process overall. Here were our top takeaways:

1. Python 3 dominates as the most popular coding language across technical roles.

2. Candidates who score higher on a CodeSignal assessment earn more in their jobs.

3. Back end developers have the highest median salary of any technical role.

4. Newer coding languages like Python 3, TypeScript, React, and Bash are the highest-paying.

5. Experience, not a college degree, matters for predicting coding skill—and salary.

6. Candidates prefer CodeSignal assessments to other types of pre-hire assessments.

Want to learn more about partnering with CodeSignal to meet your technical hiring goals?

SCHEDULE A DISCOVERY CALL TODAY →

Methodology

This report is based on a survey of thousands of individuals who took CodeSignal's General Coding Framework (GCF) or Industry Coding Framework (ICF) assessments during the date ranges specified below. The survey was conducted via email outreach to verified test-takers using the SurveyMonkey platform.

Data Cleaning

General Coding Framework (GCF) post-survey and campaign survey data were merged. Industry Coding Framework (ICF) post-survey and campaign survey data were merged. Finally, GCF and ICF merged datasets were merged together.

The sample was limited to respondents who indicated they live in the United States and completed the GCF or ICF successfully.

Sample

The total sample size is 2,846 (GCF and ICF datasets combined).

Timeframe for candidate test completion for the GCF campaign was 2021-08-01 to 2022-07-27, and the timeframe for the ICF campaign was 2022-01-01 to 2022-10-31 (Year, Month, Day format).