This survey is **anonymous**. Please answer the questions according to your immediate thoughts.

How to fill in the paper survey
Below you can see how you mark an answer option in the check boxes, and how you change a selection.

☒ The answer option has been marked correctly

☒ The answer option has been marked incorrectly, the cross must be in the middle of the box

☒ The answer option has been marked incorrectly, the cross is too strong

■ Changed selection, the answer option will not be counted as being marked

1. What gender do you identify as?

□ male
□ female
□ non-binary
□ other
□ prefer not to disclose

2. What is your age (in years)?

3. What is your educational background?

□ Computer Science/Software Engineering/Data Science/Machine Learning
□ STEM (Science/Technology/Engineering/Mathematics, excluding CS/SE/DS/ML)
□ Non-STEM
□ Mixed

4. What is your profession?

□ software engineer or developer
□ tech lead or manager
□ devops
□ QA or tester
□ data scientist
□ data analyst
□ product manager
□ professor
□ researcher (e.g., postdoc)
□ Ph.D. student
□ postgraduate student
□ undergraduate student
□ teaching staff
□ other

If other, please specify:

5. What kind of organization are you currently working for?

□ multinational corporation
□ small or medium-sized company
□ university or other educational institute
□ not-for-profit organization
□ self-employed or independent developer
□ I'm still a student or learner
□ other

6. Which country do you reside in?

7. What is your native language?

8. What is your English level?

□ native or bilingual proficiency

□ full professional proficiency

□ professional working proficiency

□ limited working proficiency

□ elementary proficiency

9. Do you identify as a programmer?

□ Yes

□ No

If not, how do you categorize your coding practice?

10. What is your level of programming skill (with your best language)?

□ Expert

□ Advanced

□ Intermediate

□ Beginner

11. How many years of programming experience do you have?

12. How confident do you feel about programming in general?

□ very confident □ somewhat confident □ unsure or depends □ not so confident

□ not confident at all

13. How would you rate your programming skill compared to co-workers in a similar position or classmates in the same study year? and to professional programmers with 10 years of experience?

	much worse	worse	same	better	much better
co-workers or classmates	□	□	□	□	□
10-year-experience programmers	□	□	□	□	□

14. Which programming language are you most comfortable with (in terms of proficiency)?

What other programming languages are you familiar with?

15. Is this programming language (that you are most comfortable with) also your favorite?

□ Yes

□ No

Can you explain what you liked or not liked about it?

Can you explain what you liked or not liked about it?

16. Which programming paradigms are you familiar with?

□ object oriented programming (e.g. Java)

□ imperative programming (e.g., C)

□ functional programming (e.g., Haskell)

□ logic programming (e.g., Prolog)

17. How often do you code every week in the past three months?

□ Almost every day each week

□ 3-4 days per week

□ 1-2 days per week

□ read code mostly

□ read code sometimes

□ read code occasionally

□ never need to write or read code

And which programming language(s) was it?

18. In the past three months, how many hours on average did you spend on the following activities every week?

unit: hour (numbers only)

Total weekly working hours	
meetings	
code review/process	
programming	
tests	
deploy/operations	
mentoring	
learning/training	
other	

Among the 'other' category, are there any activities also related to programming or software development? If so, could you specify?

19. Which operating systems do you use for programming?

□ Windows

□ Mac OS

□ Linux

□ Other

20. Which integrated development environments (IDEs) or editors do you use for programming?

21. Do the IDEs or editors provide any of the following functionalities or features?

□ code auto-implementation

□ code auto-completion

□ code auto-refactoring

□ syntax highlighting or styling

□ program analysis/code analysis

□ code summarization

□ code visualization

□ gaze control and/or gaze visualization

□ other

If you selected 'other', please specify:

22. Which version control systems do you use for programming?

□ Git

□ Subversion

□ Mercurial

□ Other

23. Have you used any of the following AI-enabled tools for programming?

□ Github Copilot

□ ChatGPT

□ Other similar tools

□ Never used any of them

If you selected 'other', please specify:

Can you elaborate on the main reasons for not using AI-enabled programming/developer tools?

Do you think AI-enabled programming/developer tools such as ChatGPT and Copilot are useful?

□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

24. What concrete tasks do you usually use these AI-enabled programming/developer tools (e.g., ChatGPT, Copilot) for?

25. What do you think are the pros and cons of these AI-enabled programming/developer tools (e.g., ChatGPT, Copilot)?

26. Have you heard of program analysis (a.k.a. software analysis/code analysis)? Program analysis is the process of automatically analyzing the behavior of computer programs regarding a property such as correctness, robustness, safety and liveness. It focuses on two major areas: program optimization and program correctness. Program analysis can be: static (without executing the code), dynamic (during runtime) or hybrid. (Wikipedia, 2023)

□ Yes

□ No

Can you type out one or more program analysis tools (a.k.a. analyzers/checkers/linters) that you're aware of?

Have you ever used any program analysis tools?

□ Yes

□ No

Do you still use any program analysis tools?

□ Yes

□ No

Could you elaborate on the main reasons for not using program analysis tools from your point of view?

When do you use program analysis tools? (you can select one or more answers)

□ before I compile/build my program □ when I compile/build my program

□ after I compile/build my program □ other

At what stage do you use program analysis tools? (you can select one or more answers)

□ before I push my code to the repository □ when I push my code to the repository

□ after I push my code to the repository □ Other

Where do you use program analysis? (you can select one or more answers)

□ command line

□ IDEs or editors

□ building tools (e.g., gradle/maven/ant/bazel)

□ code review tools (e.g., gerrit/github/gitlab)

□ CD/CI tools (e.g., jenkins/teamcity)

□ Cloud (e.g., AWS/Azure)

□ other

If neither of the above questions reflects your situation, in what kind of scenario do you use it?

What was your first-time experience with using program analysis tools?

Do you think your English level has an impact on your understanding of program analysis results?

□ No impact □ Little impact □ Low impact □ Some impact □ High impact

Do you have any comments on this?

Do you find program analysis results useful?

□ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

Could you elaborate on the main reasons why you don't find them useful?

We want to better understand how can we make program analysis more useful to you. How do you feel about the following directions? And what are your thoughts or concerns (if any) about them?

a. Enable and enhance program analysis by utilizing machine learning or AI? e.g., adapt the presentation of program analysis results based on your previous interaction with the system. e.g., use a system like ChatGPT to improve the presentation of program analysis results

□ Very negative □ Negative □ Neutral □ Positive □ Very positive

Do you have any comments on this?

b. Enable program analysis by using eye-tracking technology? e.g., capture your eye movement on the code you're reading and share this knowledge with the IDE/editor so that it can take actions to better support you e.g., capture your gaze on the code and use ML algorithms to make predictions of your expertise with respect to the task at hand and/or the task difficulty

□ Very negative □ Negative □ Neutral □ Positive □ Very postive

Do you have any comments on this?

c. Gamify the use of program analysis? e.g., get tokens/rewards accumulated and introduce levels tied to your account e.g., show a celebration emoji (in a non-disturbing manner if possible) each time you fix a bug

□ Very negative □ Negative □ Neutral □ Positive □ Very positive

Do you have any comments on this?

27. What is your biggest pain or issue with programming?

28. In general, do you think your English level has an impact on your understanding of error messages generated by programming or developer tools?

□ No impact □ Little impact □ Low impact □ Some impact □ High impact

Do you have any comments on this?

29. What technology do you think would improve your experience with programming? And in what ways can it help (if you have any ideas about this)□

30. If we are going to organize a co-design workshop, would you be interested in attending it? (A co-design workshop is a collaborative space where we create paper prototypes or sketch our ideas on paper collectively. This can take place either in person on-site or in a virtual or hybrid format, so your location should not be a barrier to your participation.)

□ Yes

□ No

If yes and you would like to receive an invitation when it happens, please type your email here:

31. Is there anything else you would like to mention?