

Group A Experiment

Experiment Description

In the following questionnaire, you will be asked to read and analyze 2 short methods written in the Java programming language.

Regarding these methods, you will be presented with questions related to understanding the functionality expressed in the method and a maintenance process for it.

At the beginning of this questionnaire, you will be asked some personal questions that will be used solely for the purpose of conducting this study.

At the end of it, you will be asked a few more questions regarding your impressions and opinions about the experience of the just-conducted experiment.

The expected duration for this experiment is approximately 15 minutes. During this time period, you will be presented with various code comprehension and maintenance activities.

The experiment has been structured to make the experience interesting and engaging, while also being clear and understandable.

For the conduct of this questionnaire, it is planned to use materials shared in the drive folder available at the following address:

https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_qKDy70cM?usp=drive_link

Participation in the survey is entirely voluntary.

You have the autonomy to stop answering and exit the survey at any time should you choose to do so.

About data:

Your participation in this study will primarily contribute to scientific research. The results of this research will be accessible through the dissertation or scientific publications resulting from this study.

The researchers gather social and demographic data in a manner that ensures anonymity and does not reveal personal identifying information.

The researchers assure that any personal information obtained through this research will be treated as confidential and will not be shared or disclosed to third parties. This questionnaire utilizes the Google Docs app package, meaning that any information collection and utilization through it are governed by the Google Privacy Policy (<https://www.google.co.uk/policies/privacy/>).

Thanks in advance for your effort and time!

* Indica una domanda obbligatoria

1. I consent to the use of this data for the purpose of conducting the experiment. *

Seleziona tutte le voci applicabili.

☐ I consent

Pre-Experiment Questionnaire

Thank you for choosing to participate in this experiment. Below are the initial demographic questions for the pre-experiment questionnaire.

2. Please provide your PROLIFIC ID *

3. Create and provide a custom ID code for this experiment. *

The code should have the first two characters equal to the respective first letters of your first parent's name and your second parent's name, followed by a two-digit number of your birth month.

The code should appear as follows in the example: AF07

A = first parent's name is Andrea;

F = second parent's name is Fran;

07 = you were born in July.

4. Please indicate your age (not mandatory)

5. Please indicate your highest level of education. *

Contrassegna solo un ovale.

- ☐ High school diploma
- ☐ Bachelor's degree in Computer Science
- ☐ Bachelor's degree in other fields
- ☐ Master's degree in Computer Science
- ☐ Master's degree in other fields.
- ☐ Ph.D. degree in Computer Science
- ☐ Ph.D. degree in other fields
- ☐ Prefer not to say
- ☐ Altro:

6. Currently *

Contrassegna solo un ovale.

- ☐ I am a student
- ☐ I am a working student
- ☐ I am employed in a company
- ☐ I am self-employed
- ☐ I am unemployed
- ☐ Prefer not to say
- ☐ Altro: _____

7. How would you rate your knowledge of the Java programming language? *

Contrassegna solo un ovale.

I am not familiar with this language

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

Excellent

8. How would you rate your skills in code maintenance on Java code? *

Contrassegna solo un ovale.

I have never performed code maintenance on Java code

1

☐

2

☐

3

☐

4

☐

5

☐

Excellent

Comprehension of Method 1

This section of the questionnaire will be dedicated to the analysis and comprehension of the first proposed method. It is possible to view and download the method from the following shared drive folder:

https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_qKDy70cM?usp=drive_link

9. Specify the **start** time in the format hh:mm. *

Esempio: 08:30

10. What is the main functionality expressed in this method? *
(It is possible to view and download the method from the following shared drive folder:
https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_gKDy70cM?usp=drive_link).

```
//Code summary: calculates the sum of the current function

private CVariant functionSum(Stack stack) throws CExpressionError {
    int params = getValue(stack, 0).getInt();
    //param stack a expression stack with function parameters
    if (params < 2) throw new CExpressionError("Expected more then 2 parameters");
    CVariant result = new CSoftVariant(getValue(stack, params));
    for (int i = params-1; i ≥ 1; i--) {
        result.add(getValue(stack, i));
    }
    return result; //return a function result
}
```

Contrassegna solo un ovale.

- ☐ It performs a subtraction operation between two parameters and returns the result.
- ☐ It sorts the parameters in ascending order and returns the sorted array.
- ☐ It checks if the number of parameters is greater than two and throws an exception if not.
- ☐ It sums a series of parameters passed to the function and returns the final result.

11. Specify the **end** time in the format hh:mm. *

Esempio: 08:30

12. How confident are you in the answer given to the previous question? *

Contrassegna solo un ovale.

Not confident at all

1

☐

2

☐

3

☐

4

☐

5

☐

Extremely confident

13. Please indicate for each of the following items how important it was to understand the functionality expressed by the code. *

Contrassegna solo un ovale per riga.

	Not useful at all	Slightly useful	Neither useful nor useless	Useful	Very useful
Method name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Code summary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable names	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usage of variables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comments within the method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods called within the code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Which of the following is a vegetable? *

Contrassegna solo un ovale.

- ☐ Eggs
- ☐ Pizza
- ☐ Broccoli
- ☐ Salmon
- ☐ Milk

15. Did you rely on other aspects to understand the code? If yes, please mention them here.

Maintenance of Method 1

This section of the questionnaire will be dedicated to the maintenance process of the previously analyzed method. You will be able to review the resulting codes for the different modifications we will propose. The codes are available and can be downloaded from the following shared drive folder:

https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_qKDy70cM?usp=drive_link

16. Specify the **start** time in the format hh:mm. *

Esempio: 08:30

17. Which of the following modifications would you make to the code? Here follows the method. *

(You can view and download the codes related to the proposed modifications in the following Google Drive

folder: https://drive.google.com/drive/folders/1ORLrRhScbcUvPwnKeNZqwZY_gKDyZ0cM?usp=drive_link).

```
//Code summary: calculates the sum of the current function

private CVariant functionSum(Stack stack) throws CExpressionError {
    int params = getValue(stack, 0).getInt();
    //param stack a expression stack with function parameters
    if (params < 2) throw new CExpressionError("Expected more then 2 parameters");
    CVariant result = new CSoftVariant(getValue(stack, params));
    for (int i = params-1; i ≥ 1; i--) {
        result.add(getValue(stack, i));
    }
    return result; //return a function result
}
```

Contrassegna solo un ovale.

- ☐ Use more descriptive variable and function names.
- ☐ Change the condition 'if (params < 2)' to 'if (params <= 2)'.
- ☐ Change the 'for' loop to iterate starting from 1 and incrementing up to 'params'.
- ☐ Completely remove the conditional 'if' block that checks if 'params' is less than 2.

18. Specify the **end** time in the format hh:mm. *

Esempio: 08:30

19. How confident are you in the modification made to the code in the previous question? *

Contrassegna solo un ovale.

Not confident at all

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

Extremely confident

20. What did you base your decisions on when choosing the changes to make during code maintenance? Rate the importance of each of the following items. *

Contrassegna solo un ovale per riga.

	Not useful at all	Slightly useful	Neither useful nor useless	Useful	Very useful
Method name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Code summary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable names	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usage of variables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comments within the method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods called within the code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Did you consider any other aspects for code maintenance? If yes, please mention them here.

Comprehension of Method 2

This section of the questionnaire will be dedicated to the analysis and comprehension of the second proposed method. It is possible to view and download the function from the following shared drive folder:

https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_qKDy70cM?usp=drive_link

22. Specify the **start** time in the format hh:mm. *

Esempio: 08:30

23. What is the main functionality expressed in this method? *
(It is possible to view and download the method from the following shared drive folder:
https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_gKDy70cM?usp=drive_link).

```
protected int innerProcString(Lexem curr) {  
    curr.tokenType = UNKNOWN;  
    char temp = curr.token.charAt(0);  
    if (isQuote(temp)) {  
        curr.tokenType = STRING;  
        char quote = temp;  
        while (bufferPos < bufferLen) {  
            temp = buffer.charAt(bufferPos);  
            if (temp == '\n' || temp == '\r') break;  
            curr.token += temp;  
            bufferPos++;  
            if (temp == quote) break;  
        }  
    }  
    return curr.tokenType;  
}
```

Contrassegna solo un ovale.

- ☐ It checks if a character is a quotation mark.
- ☐ It performs tokenization of a string.
- ☐ It checks if a string contains newline or carriage return characters.
- ☐ It returns the type of the current token.

24. Specify the **end** time in the format hh:mm. *

Esempio: 08:30

25. How confident are you in the answer given to the previous question? *

Contrassegna solo un ovale.

Not confident at all

1

☐

2

☐

3

☐

4

☐

5

☐

Extremely confident

26. Please indicate for each of the following items how important it was to understand the functionality expressed by the code. *

Contrassegna solo un ovale per riga.

	Not useful at all	Slightly useful	Neither useful nor useless	Useful	Very useful
Method name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable names	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usage of variables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods called within the code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Did you rely on other aspects to understand the code? If yes, please mention them here.

Maintenance of Method 2

This section of the questionnaire will be dedicated to the maintenance process of the previously analyzed method. You will be able to review the resulting codes for the different modifications we will propose. The codes are available and can be downloaded from the following shared drive folder:

https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_qKDy70cM?usp=drive_link

28. Specify the **start** time in the format hh:mm. *

Esempio: 08:30

29. Which of the following modifications would you make to the code? Here follows the method. *

(You can view and download the codes related to the proposed modifications in the following Google Drive

folder: https://drive.google.com/drive/folders/1ORLtRhScbcUvPwnKeNZqwZY_gKDyZ0cM?usp=drive_link).

```
protected int innerProcString(Lexem curr) {
    curr.tokenType = UNKNOWN;
    char temp = curr.token.charAt(0);
    if (isQuote(temp)) {
        curr.tokenType = STRING;
        char quote = temp;
        while (bufferPos < bufferLen) {
            temp = buffer.charAt(bufferPos);
            if (temp == '\n' || temp == '\r') break;
            curr.token += temp;
            bufferPos++;
            if (temp == quote) break;
        }
    }
    return curr.tokenType;
}
```

Contrassegna solo un ovale.

- ☐ The variable `curr.tokenType` is assigned as "NUMBER" instead of "STRING" within the if block.
- ☐ Changing the 'if' statement from 'if (temp == '\n' || temp == '\r')' to 'if (temp != '\n' && temp != '\r')'.
- ☐ Adding '\t' as a break condition.
- ☐ Replacing 'break' in the 'if (temp == '\n' || temp == '\r')' statement with 'return curr.tokenType'.

30. Specify the **end** time in the format hh:mm. *

Esempio: 08:30

31. How confident are you in the modification made to the code in the previous question? *

Contrassegna solo un ovale.

Not confident at all

1

☐

2

☐

3

☐

4

☐

5

☐

Extremely confident

32. What did you base your decisions on when choosing the changes to make during code maintenance? Rate the importance of each of the following items. *

Contrassegna solo un ovale per riga.

	Not useful at all	Slightly useful	Neither useful nor useless	Useful	Very useful
Method name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variable names	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usage of variables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods called within the code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. Which of the following is not a month? *

Contrassegna solo un ovale.

- ☐ January
- ☐ February
- ☐ Wednesday
- ☐ April
- ☐ May
- ☐ June

34. Did you consider any other aspects for code maintenance? If yes, please mention them here.

Post-Experiment Questionnaire

Thank you again for participating in this experiment. Below are the concluding questions for the post-experiment questionnaire.

35. How would you evaluate the level of complexity encountered during the code comprehension activity? *

Contrassegna solo un ovale.

Very easy

1

☐

2

☐

3

☐

4

☐

5

☐

Very complex

36. Please indicate the level of fatigue you experienced during the code comprehension phase.

*

Contrassegna solo un ovale.

Not tiring at all

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

Very tiring

37. How would you evaluate the level of complexity encountered during the code maintenance process? *

Contrassegna solo un ovale.

Very easy

1

☐

2

☐

3

☐

4

☐

5

☐

Very complex

38. Please indicate the level of fatigue you experienced during the code maintenance phase.

*

Contrassegna solo un ovale.

Not tiring at all

1

2

3

4

5

Very tiring

39. Feel free to share any thoughts or observations you have regarding the code comprehension phase or about the code maintenance process, if you wish.

Questi contenuti non sono creati né avallati da Google.

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