Group H 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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?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 methodfrom the following shared drive folder:
https://drive.google.com/drive/folders/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?usp=drive_link).

```java
public void loadFromStream(InputStream stream) throws IOException {
    sections.clear();
    String s = readLine(stream);
    if (s == null) return;
    CItemArray section = new CItemArray();
    sections.putValue("", section);
    while (s != null) {
        if (s.startsWith("[")) {
            s = s.substring(1);
            if (s.endsWith("]"))
                s = s.substring(0, s.length()-1);
            section = new CItemArray();
            sections.putValue(s, section);
        }
        else {
            String[] parts = splitLine(s);
            section.putValue(parts[0].toUpperCase(), s);
        }
        s = readLine(stream);
    }
}
```

Contrassegna solo un ovale.

( ) Remove all elements present in the "sections" data structure.

( ) Read a line from the stream and return a string if the line is not null.

( ) Split a string into an array of strings using a specific delimiter.

( ) Read data from an input stream and save it in a data structure called "sections."

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	⬭	⬭	⬭	⬭	⬭
Variable names	⬭	⬭	⬭	⬭	⬭
Usage of variables	⬭	⬭	⬭	⬭	⬭
Methods called within the code	⬭	⬭	⬭	⬭	⬭

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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?usp=drive_link).

```java
public void loadFromStream(InputStream stream) throws IOException {
    sections.clear();
    String s = readLine(stream);
    if (s == null) return;
    CItemArray section = new CItemArray();
    sections.putValue("", section);
    while (s != null) {
        if (s.startsWith("[")) {
            s = s.substring(1);
            if (s.endsWith("]"))
                s = s.substring(0, s.length()-1);
            section = new CItemArray();
            sections.putValue(s, section);
        }
        else {
            String[] parts = splitLine(s);
            section.putValue(parts[0].toUpperCase(), s);
        }
        s = readLine(stream);
    }
}
```

Contrassegna solo un ovale.

◯ Removal of the instruction 'sections.clear()'.

◯ Insertion of the line 'section = sections.get(s)' immediately after inserting a new section into the sections map.

◯ The line 'sections.clear()' is added within the else block.

◯ Added a variable named currentSection of type CItemArray to keep track of the current section during iteration.

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	◯	◯	◯	◯	◯
Variable names	◯	◯	◯	◯	◯
Usage of variables	◯	◯	◯	◯	◯
Methods called within the code	◯	◯	◯	◯	◯

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 method from the following shared drive folder:
https://drive.google.com/drive/folders/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?usp=drive_link).

```java
//Code summary: run the check thread

public void run() {
    //Checks the pool and delivers a mail message
    Properties props = new Properties();
    Session session = Session.getInstance(props, null);
    while (!Thread.currentThread().interrupted()) {
        try {
            String key = outgoing.accept(delayTime);
            log(Thread.currentThread().getName() + " will process mail " + key);
            MailImpl mail = outgoing.retrieve(key);
            deliver(mail, session);
            outgoing.remove(key);
            mail = null;
        }
        catch (Exception e) {
            log("Exception caught in RemoteDelivery.run(): " + e);
        }
    }
}
```

Contrassegna solo un ovale.

⬭ The function generates a mail session using the specified properties.

⬭ The function checks and delivers mail messages from the pool.

⬭ The function accepts a key for a mail message and processes it.

⬭ The function removes successfully sent mail messages from the pool.

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	◯	◯	◯	◯	◯
Code summary	◯	◯	◯	◯	◯
Variable names	◯	◯	◯	◯	◯
Usage of variables	◯	◯	◯	◯	◯
Comments within the method	◯	◯	◯	◯	◯
Methods called within the code	◯	◯	◯	◯	◯

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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?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/1YBJlVdJ6uZtYXX92XFl6QOzA5PCcJAkS?
    usp=drive_link).

```java
//Code summary: run the check thread

public void run() {
    //Checks the pool and delivers a mail message
    Properties props = new Properties();
    Session session = Session.getInstance(props, null);
    while (!Thread.currentThread().interrupted()) {
        try {
            String key = outgoing.accept(delayTime);
            log(Thread.currentThread().getName() + " will process mail " + key);
            MailImpl mail = outgoing.retrieve(key);
            deliver(mail, session);
            outgoing.remove(key);
            mail = null;
        }
        catch (Exception e) {
            log("Exception caught in RemoteDelivery.run(): " + e);
        }
    }
}
```

Contrassegna solo un ovale.

⭕ Add a finally clause at the end of the try-catch block to release the session and props
   resources at the end of each iteration of the while loop.

⭕ Remove 'try-catch' block.

⭕ Modify the 'while' statement with while (Thread.currentThread().interrupted()).

⭕ Set the variable 'mail' to 0.

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	◯	◯	◯	◯	◯
Code summary	◯	◯	◯	◯	◯
Variable names	◯	◯	◯	◯	◯
Usage of variables	◯	◯	◯	◯	◯
Comments within the method	◯	◯	◯	◯	◯
Methods called within the code	◯	◯	◯	◯	◯

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.

_____

_____

_____

_____

Google Moduli