

Expectations on Automated Comment Generation Techniques

We have been conducting a survey on Code Comment which will take you around 10-15 min to finish.

According to Wikipedia, a comment is a programmer-readable explanation or annotation in the source code of a computer program. They are added with the purpose of making the source code easier for humans to understand. As the figure shows, code comments are used to describe Classes, Methods, and Statements.

As such, the main goals of this survey are: (1) to investigate how do you deal with code comments in practice; (2) to investigate the importance of code comment generation tools; (3) to investigate your expectation on code comment generation tools.

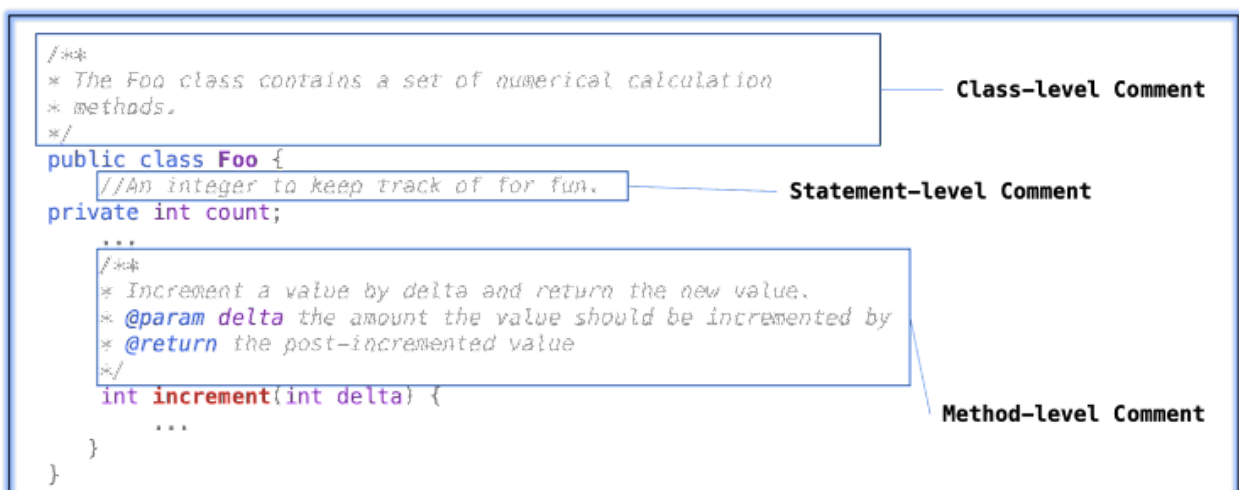
In this survey, we are going to present you 5 topics related to Code Comments, and each topic includes a set of conclusions we summarized. Please choose the conclusions as the levels of importance (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) according to your work experience. You can skip any questions you are not interested.

We thank your time and support. Your feedback will be helpful to inform better tool for software development practices.

Please Note that no personally identifiable information will be associated with your responses to any reports of these data. All information provides will be treated strictly as confidential and purely for academic purpose.

Many thanks

An Example of code comment



Background information about participants

1. Current country/area of residence?

2. What is your current occupation?

Mark only one oval.

☐ Industrial or freelance professional

☐ Academic or industrial researcher

☐ Undergraduate/graduate student

☐ Other:

3. How long have you worked in software development?

(in years)

4. Which of the following best describes your primary job role?

Mark only one oval.

☐ Development

☐ Testing

☐ Algorithm/ML Model Design

☐ Project manager

☐ Architect

☐ Other:

5. About how many years of experience do you have with your primary job role?

(Please input a number, decimals okay)

6. How many people in your team?

(Please input a number, decimals okay)

7. Your primary programming language?

Check all that apply.

- ☐ Java
- ☐ C/C++
- ☐ Python
- ☐ JavaScript
- ☐ C#

Other: ☐

Topic 1: Comment Practice

8. What's your comment practice during the development?

Please kindly rate each statement as below:

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
I often write comment during software development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm often confused when reading code without comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are many high-quality comments in my projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Projects with longer life cycle usually have higher quality comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large projects usually contain high-quality comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My team conducts comment reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Topic 2: Comment Issues

9. What comment issues exist in your project?

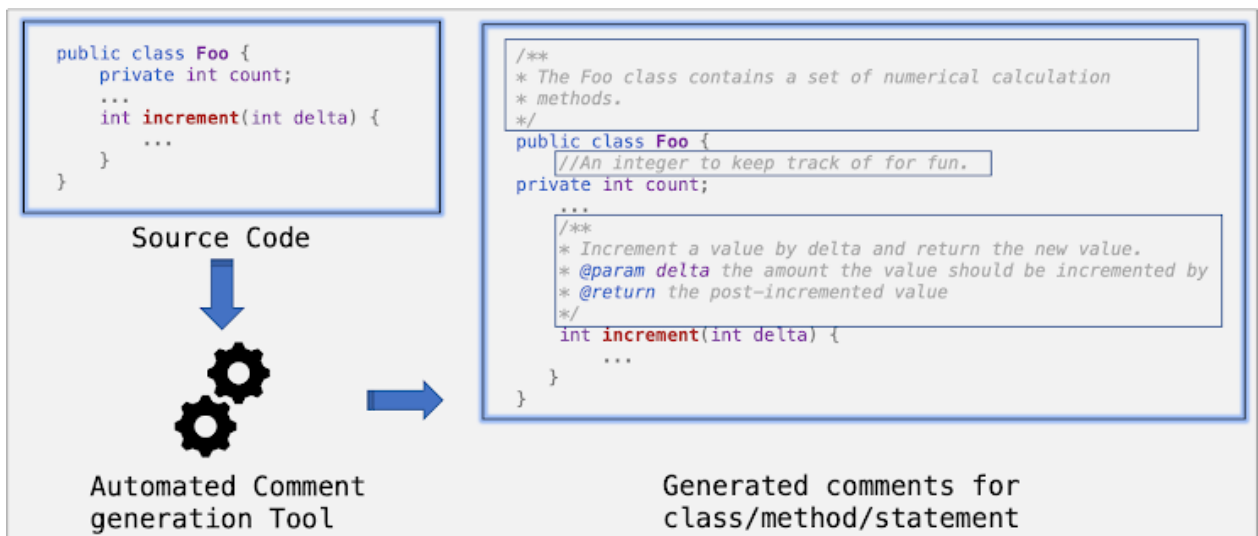
Please kindly rate each statement as below:

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
My project has lack of comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My project has outdated comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My project has comments inconsistent with code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My project has too long comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My project has redundant comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My project has too general comments (e.g., comments lack of details)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Topic 3: Importance

Automated comment generation has been an active area of research. We are currently working on a survey of code comment generation tool. As shown in the figure, the code comment generation tool can generate comments (like JavaDoc for Java or Docstrings for Python) for source code. These comments may describe functionality or implementation details of the code snippets.



10. I think code comment generation tool is:

Mark only one oval.

- ☐ Essential (I will use this tool every day to help software development or code comprehension)
- ☐ Worthwhile (I will use this tool to help software development or code comprehension)
- ☐ Unimportant (I will not use this tool)
- ☐ Unwise (This tool will harm my or my team's productivity)
- ☐ I don't understand

11. Please explain your response to the above question

12. Please kindly rate each statement as below:

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
This tool can improve my development efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This tool can help me to understand code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This tool can improve code readability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This tool can help me to check consistency between code and comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This tool can help me to check if the code is self-explanatory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Topic 4: Expectations

13. I expect the tool can generate comments for classes

```

/**
 * The Foo class contains a set of numerical calculation
 * methods.
 */
public class Foo {
    //An integer to keep track of for fun.
    private int count;

    ...
    /**
     * Increment a value by delta and return the new value.
     * @param delta the amount the value should be incremented by
     * @return the post-incremented value
     */
    int increment(int delta) {
        ...
    }
}

```

Class-level Comment

Mark only one oval.

- ☐ Strong Disagree *Skip to question 18*
- ☐ Disagree *Skip to question 18*
- ☐ Agree *Skip to question 14*
- ☐ Strong Agree *Skip to question 14*

Expectation on class-level comments

14. What information should be included in the class comment?

Mark only one oval per row.

[illegible]

15. What class do you think need to be commented?

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
Class with complex logic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
User-defined Exceptions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Designed Classes (e.g., a class uses factory design pattern)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utility Classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. When do you expect the tools to generate comments for classes?

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
Generate comments when complete a file	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generate comments when complete a class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Preferred Length for class-level comments

What the length of code comment do you expect?

Mark only one oval.

- ☐ 1 line
- ☐ 2-3 lines
- ☐ 4-5 lines
- ☐ >5 lines
- ☐ Other: _____

Topic 4: Expectations

18. I expect the tool can generate comments for methods

```
/**
 * The Foo class contains a set of numerical calculation
 * methods.
 */
public class Foo {
    //An integer to keep track of for fun.
    private int count;

    /**
     * Increment a value by delta and return the new value.
     * @param delta the amount the value should be incremented by
     * @return the post-incremented value
     */
    int increment(int delta) {
        ...
    }
}
```

Method-Level Comment

Mark only one oval.

- ☐ Strong Disagree Skip to question 23
- ☐ Disagree Skip to question 23
- ☐ Agree Skip to question 19
- ☐ Strong Agree Skip to question 19

Expectation on method-level comments

19. What information should be included in the method comment?

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree
Functionality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to use this method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementation Details	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Example cases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Input&Output	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The reason or design basis for writing the method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Workflow diagram, e.g., workflow in text form like A--->B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical Debt, e.g., TODOs and Fixme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. What method do you think need to be commented?

Mark only one oval per row.

[illegible]

21. When do you expect the tools to generate comments for methods?

Mark only one oval per row.

[illegible]

22. Preferred Length for method-level comments

What the length of code comment do you expect?

Mark only one oval.

- ☐ 1 line
- ☐ 2-3 lines
- ☐ 4-5 lines
- ☐ >5 lines
- ☐ Other: _____

Topic 4: Expectations

23. I expect the tool can generate comments for statements

```
/**
 * The Foo class contains a set of numerical calculation
 * methods.
 */
public class Foo {
    //An integer to keep track of for fun.
    private int count;
    ...
    /**
     * Increment a value by delta and return the new value.
     * @param delta the amount the value should be incremented by
     * @return the post-incremented value
     */
    int increment(int delta) {
        ...
    }
}
```

Statement-Level Comment

Mark only one oval.

- ☐ Strongly disagree *Skip to question 28*
- ☐ Disagree *Skip to question 28*
- ☐ Agree *Skip to question 24*
- ☐ Strongly agree *Skip to question 24*

Expectation on statement-level comments

26. When do you expect the tools to generate comments for statements?

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
Generate comments when complete a file	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generate comments when complete a class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generate comments when complete a method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Preferred Length for statement-level comments

What the length of code comment do you expect?

Mark only one oval.

☐ 1 line

☐ 2-3 lines

☐ 4-5 lines

☐ >5 lines

☐ Other: _____

28. What are the factors that affect your acceptance of using this tool?

Mark only one oval per row.

	Strong Disagree	Disagree	Neutral	Agree	Strong Agree	I don't know
Whether the generated comments are fluent and have no grammatical errors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How much code information can be expressed in the generated comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The generated comments do not contain useless information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How similar the generated comments are to the comments written by humans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In addition to the self-explanatory information of the code, how much other information the generated comments can provide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many matching words does the generated comments compare to the comments written by humans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the following question, we would like to know the percentage of performance that the tool needs to meet before you adopt this tool

29. At least ___% generated comments cannot be distinguished by the developers whether they are machine-generated or human-written, I will adopt this tool:

Please input a number between 0-100

30. The text of generated comments that needs to be modified does not exceed ___%, I will adopt this tool:

Please input a number between 0-100

31. The generated comments can cover at least ___% code content (e.g., keywords), I will adopt this tool:

Please input a number between 0-100

32. The tool can save at least ___% time comparing with writing comments by yourself(including the time to further modify the generated comments), I will adopt this tool:

Please input a number between 0-100

33. The tool returns results in at most ___, I can accept the tool

Mark only one oval.

☐ 1s

☐ 5s

☐ 10s

☐ 30s

☐ 1min

☐ Other: _____

Any suggestions and ideas are highly welcomed !

34. Apart the above conclusions, do you have other ideas/considerations/concerns about comment or comment generation tool? Please let us know!
