

Prospects for the use of artificial intelligence systems in the educational process

Ivan Mikheev

CIT department, S. KUZNETS KhNUE

GitHub Copilot & ChatGPT

Copilot is developed by GitHub and OpenAI. The main functionality of this tool is the completion of the program code. Copilot integrates with the IDE and provides suggestions for lines of code, functions, classes, methods. Copilot is based on OpenAI language models.



ChatGPT is developed by OpenAI. This project was launched in November 2022. ChatGPT is available as a standalone tool. The main functionality of this tool is the generation of an initial template for a specific coding task.

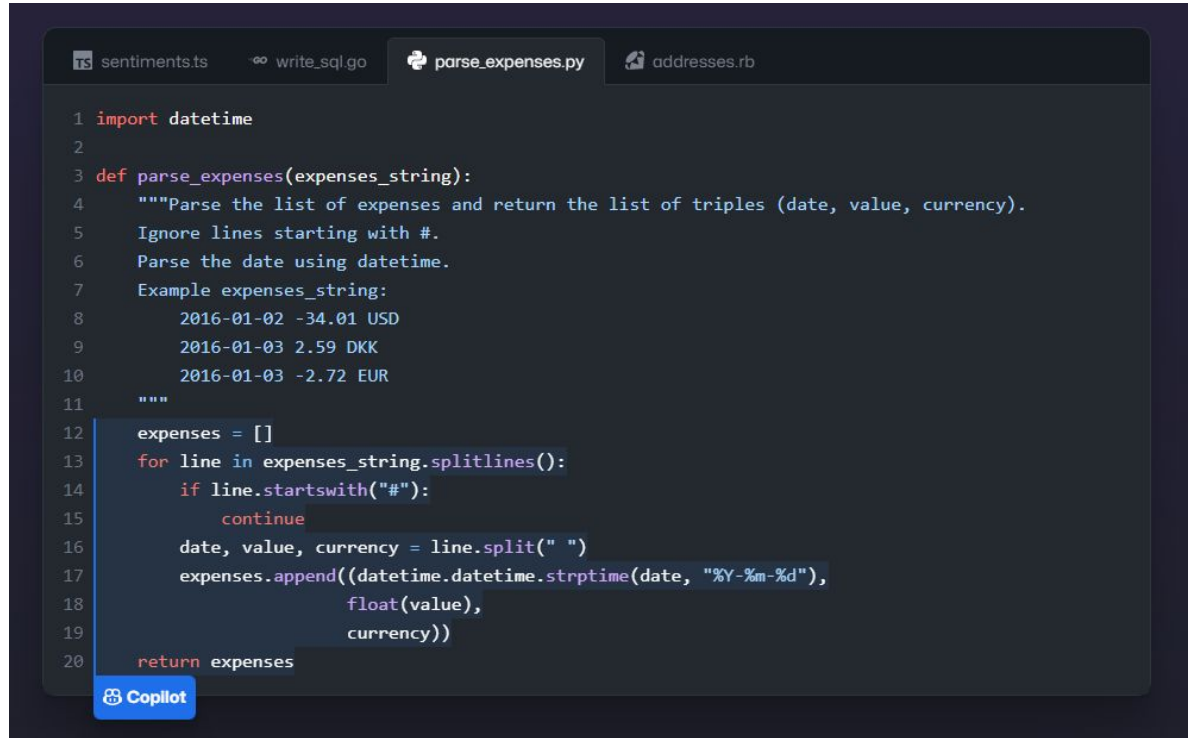
GitHub Copilot & Educational Process

Application of GitHub Copilot in the educational process

- for teachers
 - generation code example during lessons (very easy provide lessons in live coding mode)
 - generation code example for individual students work
 - generation tests for check in automation mode
- for learners
 - assistance with boilerplate code
 - accelerate ability to clear problem formalization

GitHub Copilot Example

Creating boilerplate
code for resolving task
of data transformation
using Python
programming language



```
1 import datetime
2
3 def parse_expenses(expenses_string):
4     """Parse the list of expenses and return the list of triples (date, value, currency).
5     Ignore lines starting with #.
6     Parse the date using datetime.
7     Example expenses_string:
8         2016-01-02 -34.01 USD
9         2016-01-03 2.59 DKK
10        2016-01-03 -2.72 EUR
11     """
12     expenses = []
13     for line in expenses_string.splitlines():
14         if line.startswith("#"):
15             continue
16         date, value, currency = line.split(" ")
17         expenses.append((datetime.datetime.strptime(date, "%Y-%m-%d"),
18                         float(value),
19                         currency))
20     return expenses
```

Copilot

ChatGPT & Educational Process

Application of ChatGPT in the educational process

- for teachers
 - generation code example for educational materials
 - generation code example for individual students work
 - generation tests for check in automation mode
- for learners
 - help present ideas in a clear and organised manner and in the right form
 - Provide supervising and refactoring for text, code, etc.
 - help create a software structure, code base, test, docs, etc.

ChatGPT Example

Refactor the imperative Java code in functional style and provide description of code.



Иван Михеев

please rewrite the following code in functional style



```
Collection<String> names = new ArrayList<> (Arrays.asList("Mnemonic", "Deckard", "Flynn"));
Iterator < String > it = names.iterator();
while (it.hasNext()) {
    if (it.next().length() > 5) {
        it.remove();
    }
}
names.forEach(System.out::println);
```



Here's how you could rewrite the code using functional style:



mathematica

Copy code

```
List<String> names = Arrays.asList("Mnemonic", "Deckard", "Flynn");
names.removeIf(name -> name.length() > 5);
names.forEach(System.out::println);
```

In the functional style version, we use the `removeIf()` method on the `List` to remove any names that have a length greater than 5. This method takes a predicate as an argument, which is a lambda expression that evaluates to `true` if the element should be removed.

Potential Challenges

- Accuracy and reliability problems
 - AI tools may sometimes provide inaccurate or incomplete information, which could lead to misunderstandings or confusion for students and teachers.
- Possible biases
 - AI technologies like Copilot and ChatGPT can inherit biases from the data they are trained on, which may result in biased or unrepresentative content generation that could impact teaching and learning negatively.
- Risk of decrease in original and critical thinking skills
 - The convenience and speed of AI tools might lead to an over-reliance on AI-generated content and reduce critical thinking, problem-solving, and creativity in the educational process.

Sources

Your AI pair programmer [External resource] - <https://github.com/features/copilot>

Introducing ChatGPT [External resource] - <https://openai.com/blog/chatgpt>

AI in education: GitHub Copilot in the classroom - Universe 2022 - CS50's Professor, David J. Malan of Harvard University, and Copilot Product Leader, Shuyin Zhao [External resource] - https://www.youtube.com/watch?v=uvNRE1o8ANE&ab_channel=GitHub

ChatGPT (We need to talk) / Dr Vaughan Connolly is a teacher and researcher with interests in the role of technology in education and teacher workload. Dr Steve Watson is co-convener of the Faculty's Knowledge, Power and Politics research cluster, and has used social systems theory to explore the meaning and communication of ChatGPT [External resource] - <https://www.cam.ac.uk/stories/ChatGPT-and-education>