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Programming with AI
-
Github Copilot in action

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Programming with AI – Github Copilot in action

Content of workshop

- Tools
- What is Github Copilot?
- Pratices for using Copilot
- More advanced practices (by ChatGPT)
- Coding
- Demo
- More coding

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Tools

- **GitHub Copilot** https://github.com/features/copilot
  - Programming tool **plugin** for different IDEs
  - Free for students, Free trial, or monthly 10$
- **Visual Studio Code** https://code.visualstudio.com/
  - "Free. Built on open source. Runs everywhere."
  - Programming editor
  - Programming environments are installed with plugins (e.g., Java, Python, …)

Tasks:

- Get account for Copilot
- Install free Visual Studio Code (VSCode)
- Install programming environment to VSCode. Preferred environments: Java, C++, or Python.
- Install Copilot -plugin to VSCode

Make the "Helloworld" and test the environment.

Tools supported: Visual studio, Visual studio Code, NeoVim, JetBrains - IntelliJ IDEA, Android Studio, AppCode, Clion, Code With Me Guest, DataGrip, DataSpell, GoLand, JetBrains Client, MPS, PhpStorm, PyCharm, Rider, RubyMine, WebStorm

GitHub Copilot

- AI-powered code completion tool.
- Developed by GitHub and OpenAI.
- Provides suggestions for lines or blocks of code as you type.
- Works directly inside Integrated Development Environments (IDEs)
- Learns from the code you write to provide more accurate suggestions.
- Helps increase coding efficiency and reduce errors.
- Can generate new code for a variety of tasks, including comments and tests.
- Supports many programming languages.

Practices for using Copilot

1. Convert Comments to Code
2. Autofill Repetitive Code
3. Create code to test
4. Helps coding with unfamiliar languages, libraries, or frameworks
5. Creating an Application Entirely With Copilot: https://blog.logrocket.com/building-github-copilot-app/

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More advanced practices(by ChatGPT)

1. **Be Specific:** The more specific your comments and function names, the better Copilot can assist. For example, a function name like calculate_average_from_list is clearer than process_data.
2. **Double-Check the Code:** GitHub Copilot can generate code that is close to what you need, but it's essential to review and understand the code it suggests.
3. **Use Comments:** Copilot responds to the comments in your code. You can guide its suggestions by providing detailed comments that clarify your coding intentions.
4. **Be Patient and Iterative:** Sometimes, Copilot may not get it right the first time. However, by iterating and refining your inputs, you can guide Copilot to produce the code you need.
5. **Check for Security:** Copilot might suggest code that has security vulnerabilities or that is not compliant with best practices. Always review its suggestions with security in mind.
6. **Remember Copyright Laws:** The code generated by Copilot may be based on publicly available code. While Copilot's training data consists of public repositories, it's always essential to ensure the code you use does not infringe on copyright laws.
7. **Use as a Learning Tool:** Copilot can be an excellent tool for learning new languages, libraries, and frameworks. By observing the code it suggests, you can learn best practices and pick up new techniques.

Demo https://github.com/miksa007/XP2023

- Phonebook
  - Person class
  - Phonebook class
  - UI class

Exercises

- Helloworld
  - Extensions
  - Function
  - Ask user name
  - Testing functions
- CalculatorStub
  - Functions
  - Input - output

More…

Exercise 2 – Phonebook

- Create phonebook or similar application

Exercise 3 - Sudoku

- Sudoku exercise from programming course
- https://github.com/miksa007/XP2023/tree/main/SudokuExercise

More more…

Future…

- https://github.com/features/preview/copilot-x
- https://githubnext.com/

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Discussion - What’s next?