



GitHub Copilot





GitHub Copilot Mastery

ProTips Beyond the Basics



17th Annual - Orlando Code Camp - 2025

Your AI pair programmer ➔ Your buddy right in your editor





17th Annual
**Orlando
Code Camp** | 2025
Sponsors, Organizers, and Partners





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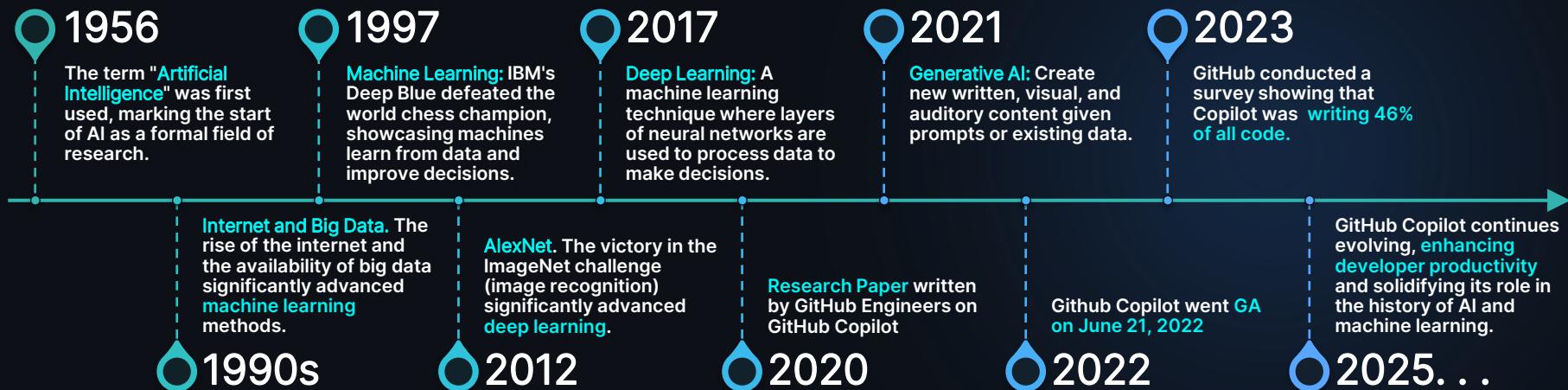
randy-pagels



GitHub Copilot

GitHub, Inc.

AI Evolution to Copilot



Artificial Intelligence

Machine Learning

Deep Learning

Generative AI

AI Model Comparison Grid

Model	Modal Type	Transformer Type	Max Tokens	Trained Data Date	Strengths
GPT-3.5	Text-only	Transformer	~16K	Sep 2021	Fast, cost-effective, good for general tasks, drafting, Q&A
GPT-4o	Text, Vision, Audio	Transformer	~128K	Oct 2023	Multimodal, strong reasoning, fast like 3.5, great balance of price/power
Claude Sonnet	Text-only	Reasoning	~200K+	Early 2023	Long context, careful tone, great summarizer, good for complex docs
o1 preview	Text-only	Reasoning	~32K–128K*	Likely 2023–2024	OpenAI-developed, solid performance, fast inference, early-stage preview
o3 mini	Text-only	Reasoning	~32K*	Likely 2024	Lightweight, optimized for cost/speed, good for embedded or fast tasks

Copilot Key Highlights

Features



- Inline completions
- Code suggestions
- Copilot Chat
- Copilot Edits
- Copilot Workspace
- Copilot for the CLI
- Copilot for mobile
- Pull request summaries
- Code reviews
- Knowledgebase search
- Policy management
- *Private repo fine-tuning

Functionality



- In-depth assistance
- Learning and teaching
- Code generation
- Comment to code
- Code explanations
- Unit testing
- Code refactoring
- Code optimizations
- Data generation
- Debugging assistance
- Document code
- Code translation

What is Required ?



GitHub account



Copilot license



Supported IDE



Free - Pro - Business - Enterprise

Licenses Comparison



VS



VS



Copilot Pro

Single Developers

- ✓ Code completion in IDEs
- ✓ Copilot Chat in IDEs
- ✓ Copilot in GitHub Mobile and GitHub.com
- ✓ Copilot in the CLI
- ✓ Block suggestions matching public code
- ✓ Copilot pull request summaries

Copilot Business

Teams and Organizations

- ✓ All features from Copilot Individual
- ✓ **Exclude** specified files from Copilot
- ✓ Organization-wide **policy management**
- ✓ Access to **audit logs**
- ✓ Increased GitHub **Models rate limits**
- ✓ Enterprise-grade security, safety, and privacy

Copilot Enterprise

Teams and Large Organizations

- ✓ All features from Copilot Business
- ✓ Copilot **Knowledgebase Search**
- ✓ Copilot Chat Skills in IDE
- ✓ Increased GitHub **Models rate limits**
- ✓ Ability to fine-tune a custom LLM*

Free

For developers looking to get started with GitHub Copilot. (limitations apply)

- ✓ Real-time code suggestions = 2,000 / month.
- ✓ Messages and interactions = 50 / month.

<https://docs.github.com/en/copilot/about-github-copilot/subscription-plans-for-github-copilot>



Supported IDEs



GitHub



VS Code



Visual Studio



Xcode



JetBrains IDEs



Neovim



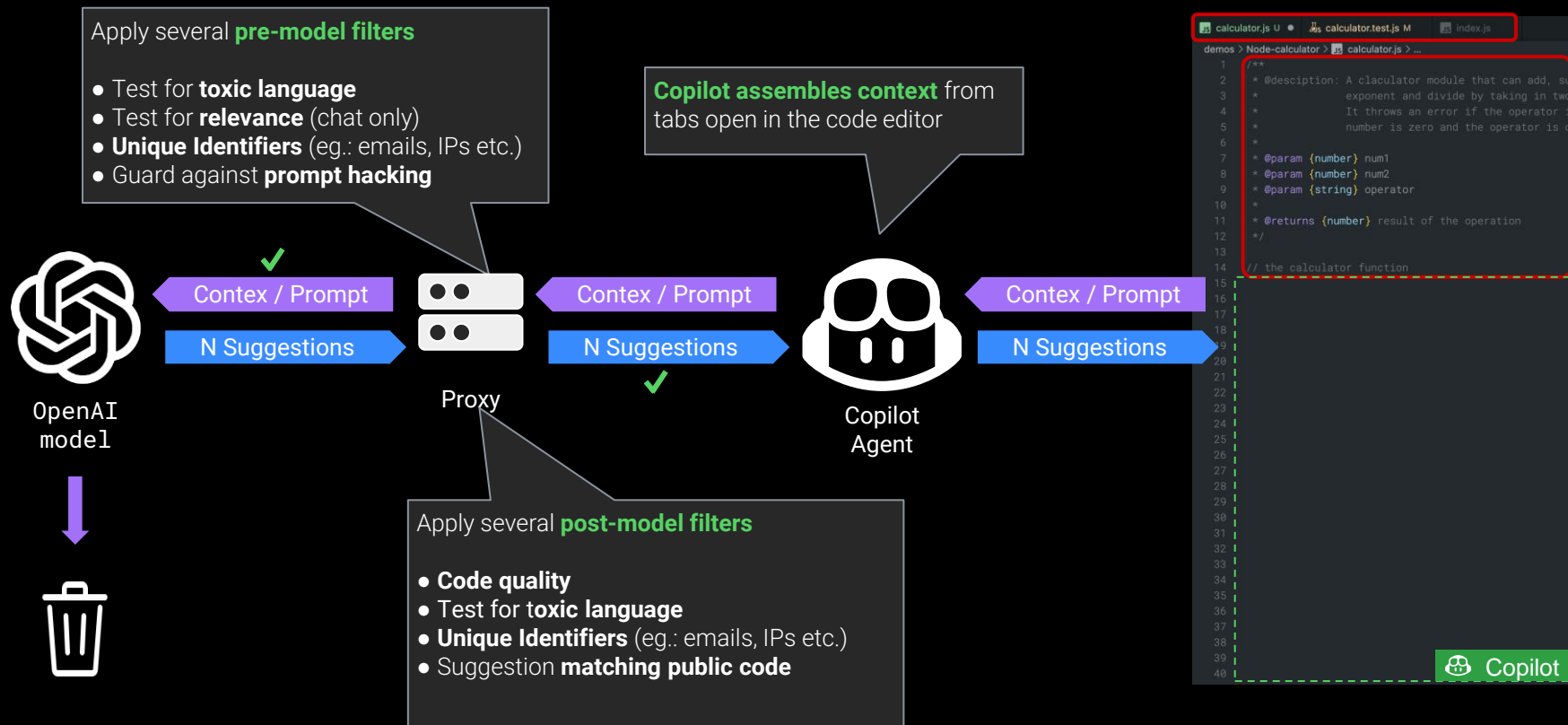
Azure Data Studio



Eclipse

* GitHub Copilot for Xcode is available in public preview.

How does GitHub Copilot work?



Security & Trust

Code and customer data

Prompts and suggestions are not used for training AI models.

Secure development


Prompts and Suggestions are filtered for security issues and PII data.

Personal data collection

Prompts and Suggestions are deleted. User interaction data is stored for 24 months.

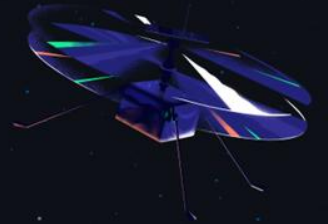
Intellectual Property Protection

Filter code suggestions snippets over 150 characters long

 Sorry, the response matched public code so it was blocked. Please rephrase your prompt. [Learn more.](#)



GitHub Copilot Features



Code Context in GitHub Copilot

Code context differs based on the Copilot feature being used

Code Completions

- Current tab
- Neighboring tabs
- Recently closed tabs*

Copilot Chat

- Attached files
- Open files
- Selected code
- Custom agents
- #filename

Copilot Edits

- Attached files
- #filename



Copilot Chat Features

GitHub Copilot

You can ask me general programming questions, or chat with the following which have specialized expertise and can perform actions:

- **@workspace** - Ask about your workspace
 - **/explain** - Explain how the code in your active editor works
 - **/tests** - Generate unit tests for the selected code
 - **/fix** - Propose a fix for the problems in the selected code
 - **/new** - Scaffold code for a new file or project in a workspace
 - **/newNotebook** - Create a new Jupyter Notebook
 - **/fixTestFailure** - Propose a fix for the failing test
 - **/setupTests** - Set up tests in your project (Experimental)
- **@vscode** - Ask questions about VS Code
 - **/search** - Generate query parameters for workspace search
 - **/startDebugging** - Generate launch config and start debugging (Experimental)
- **@terminal** - Ask how to do something in the terminal

@terminal

Ask how to do

@vision
 @vscode
 @workspace
 @terminal /explain
 @vscode /search
 @vscode /startDebugging
 @workspace /explain
 @workspace /fix
 @workspace /fixTestFailure
 @workspace /new
 @workspace /newNotebook

@ to chat with extensions

#kb

Search your enterprises' k

#codebase
 #editor
 #file
 #selection
 #sym
 #terminalLastCommand
 #terminalSelection
 #vscodeAPI
 FlightsController.cs WrightBrothersApi\Controllers\Flig
 Plane.cs WrightBrothersApi\N
 PlaneControllerTests.cs WrightBrothersApi\Tests\Controller

/ Slash Commands

Shortcuts allowing common operations

@ Custom Agents

Specialized experts for assisting with specific tasks

Chat Variables

Provides additional context for the prompt through variables

GitHub Chat Differences

Next evolution of AI-assisted development



Copilot Edits

when you want speed and control

- ✓ Interactive peer programmer
- ✓ Make targeted code changes
- ✓ Refactoring, quick fixes, adding comments
- ✓ **You know what to do**
- ✓ Fast and inline

Copilot Agents

when you want help thinking through a task


- ✓ Autonomous peer programmer
- ✓ Handle complex, multi-step tasks
- ✓ Generating tests, new features, debugging logic
- ✓ **You need help figuring out how to do it**
- ✓ Guided and interactive across files




Unit Testing Generation

Works best for
general **unit
testing** case
generation

Generate a series of unit tests for this method. Ensure to include testing for bad data. Give me just the tests and not the class or usings

 PlanesController.cs:69-83

 GitHub Copilot

> Used 3 references

```
// Generated by Copilot
[Fact]
public async Task GetById_ReturnsOkResult_WithValidId()
{
    // Arrange
    var mockLogger = new Mock<ILogger<PlanesController>>();
    var controller = new PlanesController(mockLogger.Object);
    var testId = 1;
    var testPlane = new Plane { Id = testId };
    controller.Planes.Add(testPlane);

    // Act
    var result = await controller.GetById(testId);

    // Assert
    var okResult = Assert.IsType<OkObjectResult>(result.Result);
    var returnValue = Assert.IsType<Plane>(okResult.Value);
    Assert.Equal(testId, returnValue.Id);
}
```



Ask Copilot to generate data for your tests

Plane.cs

C# PlaneControllerTests.cs:1-24



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Code Refactoring

Refactoring
is possible
through
Copilot Chat

Refactor the code to make it more readable and maintainable

FlightsController.cs:74-140

GitHub Copilot

> Used 3 references

```
[HttpPost("{id}/status")]
public ActionResult UpdateFlightStatus(int id, FlightStatus newSt
{
    var flight = Flights.Find(f => f.Id == id);
    if (flight == null)
    {
        return NotFound("Flight not found.");
    }

    var errorMessage = ValidateFlightStatusChange(flight, newStat
    if (errorMessage != null)
    {
        return BadRequest(errorMessage);
    }

    flight.Status = newStatus;
    return Ok($"Flight status updated to {newStatus}.");
}
```

```
72     }
73
74     [HttpPost("{id}/status")]
75     public ActionResult UpdateFlightStatus(int id, FlightStatus newStatus)
76     {
77         var flight = Flights.Find(f => f.Id == id);
78         if (flight != null)
79         {
80             switch (newStatus)
81             {
82                 case FlightStatus.Boarding:
83                     if (DateTime.Now > flight.DepartureTime)
84                     {
85                         return BadRequest("Cannot board after departure time.");
86                     }
87                     break;
88                 case FlightStatus.Departed:
89                     if (flight.Status != FlightStatus.Boarding)
90                     {
91                         return BadRequest("Flight must be boarding to depart.");
92                     }
93                     break;
94                 case FlightStatus.InAir:
95                     if (flight.Status != FlightStatus.Boarding)
96                     {
97                         return BadRequest("Flight must be boarding to be in air.");
98                     }
99                     break;
100            }
```



Code Debugging

Copilot can assist with
fixing and debugging code

```
public class FlightsController : ControllerBase

[HttpPost("{id}/status")]
0 references
public ActionResult
{
    var flight = Fli
    if (flight != nu
    {
        switch (newS
        {
            case Fli
                if (DateTime.TimeOfDay > flight.DepartureTime)
                {
                    return BadRequest("Cannot board, past departure time.");
                }
                break;
        }
    }
}
```

An object reference is required for the non-static field, method, or property 'DateTime.TimeOfDay' (CS0120)

TimeSpan DateTime.TimeOfDay { get; }

Gets the time of day for this instance.

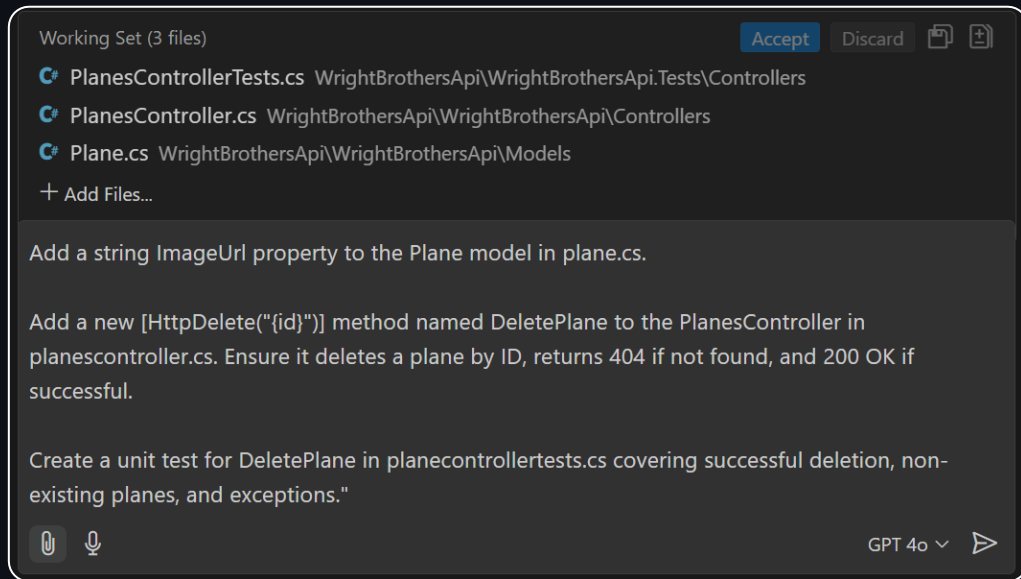
Returns:
A time interval that represents the fraction of the day that has elapsed since midnight.

View Problem (Alt+F8) Quick Fix... (Ctrl+.) Fix using Copilot (Ctrl+I)



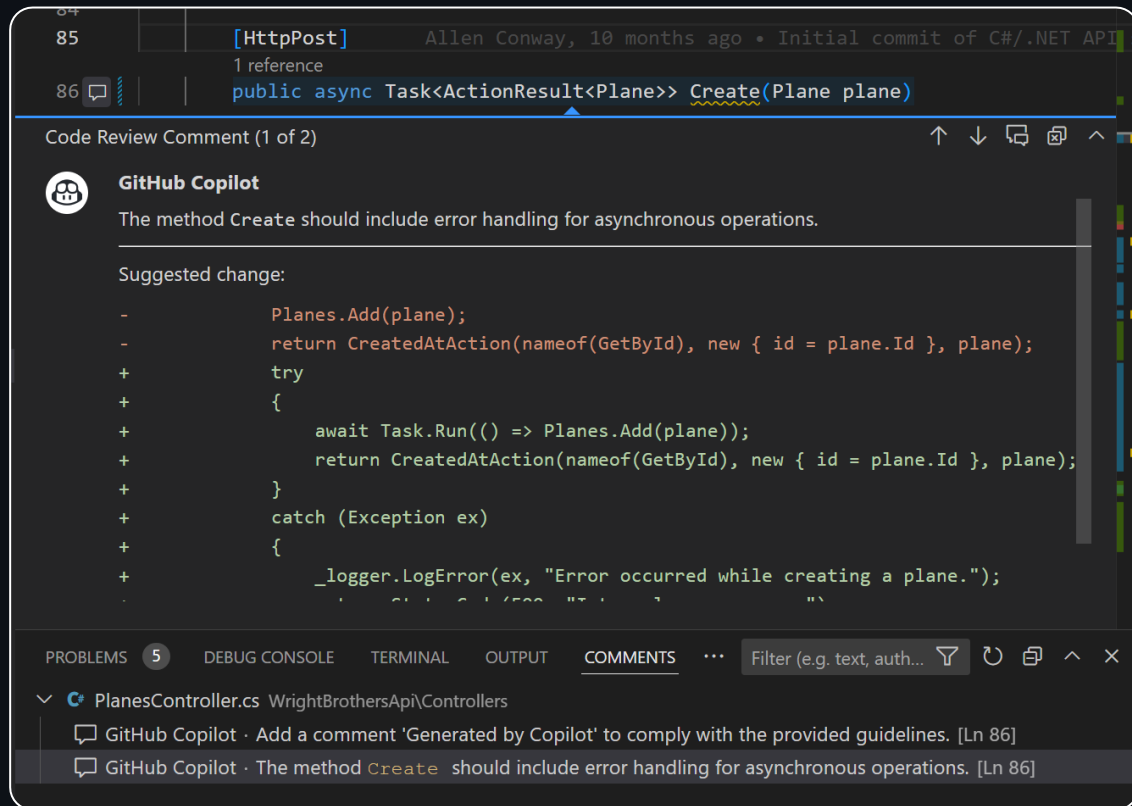
Copilot Edits

Edit **multiple files**,
visualize changes,
and **accept** or
decline updates



Copilot Code Review

Copilot can
provide **code
review** and
comments



What is a Prompt?



*In the context of Copilot, a **prompt** is a piece of code or **natural language** description that is used to **generate code** suggestions. It is the input that Copilot uses to **generate** its **output**.*

- Copilot



What is Prompt Engineering?



Prompt engineering is the process of designing and creating high-quality prompts that can be used to generate accurate and useful code suggestions with Copilot.

- Copilot





Basics of prompt engineering

Zero-Shot Prompt

Create a c# model for a FlightLogSignature property.

One-Shot Prompt

Example: 17121903-DEP-ARR-WB001

- 17th of December 1903
- Departure from Kitty Hawk, NC
- Arrival at Manteo, NC
- Flight number WB001

n-Shot Prompt

Technical Requirements

- Create a FlightLog record type
- Add a Parse method to the FlightLog record type
- The Date must be a DateTime.





Prompting Strategy

Ensure Clarity

Provide context, write clearly, and give Copilot quality input for better results

Group and Itemize Tasks

Breaking down complex tasks and use previous outcomes for efficiency

Organized approach

Leverage prompting patterns to solve complex problems



www.promptingguide.ai

Enhance and extend a C# REST API

- ✓ AI-Powered Code Suggestions
- ✓ Code Completions and Chat
- ✓ Intelligent Context Aware Assistance
- ✓ Unit Testing and Data Generation
- ✓ Debugging Techniques
- ✓ Documentation and Explanation
- ✓ Refactoring and Improving Code Quality
- ✓ Local Code Reviews
- ✓ Prompt Engineering for Data Parsing

Getting Started with GitHub Copilot
Wright Brothers Demo



GitHub Copilot References

- **GitHub Copilot Features:** <https://github.com/features/copilot>
- **GitHub Next:** <https://githubnext.com/>
- **GitHub Copilot Trust Center:** <https://copilot.github.trust.page/>
- **Prompting AI Guide:** www.promptingguide.ai
- **GitHub Copilot Change Log:** <https://github.blog/changelog/label/copilot/>
- **Xebia's GitHub Copilot News:** <https://github-copilot.xebia.ms/>
- **Take GitHub Copilot on a test-flight:** <https://resources.github.com/copilot-demo/>





Thank you

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