

AWS User Group Venezia

Martedì 18 Marzo

in presenza e in streaming

alle ore 19:00

GenAI on AWS



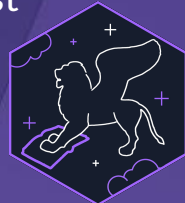
Bedrock & Roll: Building
mess-erprise AI Systems

Marco Gaion
CAIO
@ Walit



GenAI-powered assistants
compared in a real case

Alessandra Bilardi
Data & Automation Specialist
@ Corley Cloud



Promotori di AWS User Group Venezia #7



Agenda

Speech
Prossimi incontri
Spritz





Speech



GenAI-powered assistants compared in a real case

Alessandra Bilardi - Data & Automation Specialist @ Corley Cloud

@AWSUserGroupVenezia #7 #Meetup #AWS

Alessandra Bilardi, PhD

Data & Automation Specialist @ Corley Cloud

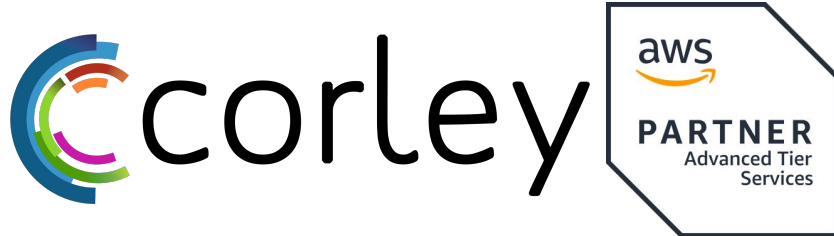
- Coderdojo Mentor
- PyData Venice Evangelist
- AWS User Group Venezia Evangelist

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🐙 bilardi

🌐 bilardi

🐦 @abilardi



Alessandra Bilardi, PhD

Data & Automation Specialist @ Corley Cloud

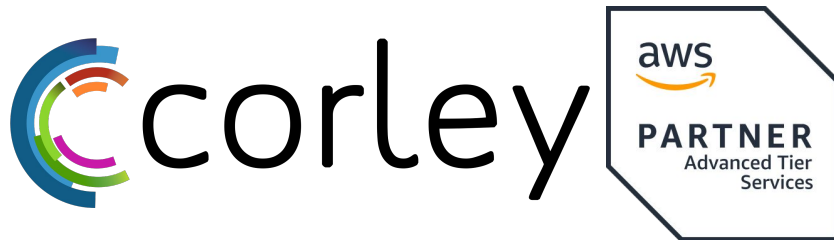
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Alessandra Bilardi, PhD

Data & Automation Specialist @ Corley Cloud

- Coderdojo Mentor
- PyData Venice Evangelist
- AWS User Group Venezia Evangelist
- AWS Community Builder in machine learning

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SUMMARY

**GenAI-powered assistant
Solutions
Take away**



GenAI-powered assistant

Why ?



- enhanced efficiency
 - real-time code completions
 - and code suggestions
- learning and upskilling
 - inline documentation
 - usage examples
- automated code reviews
 - security flaws
 - best practices
- personalization
 - coding style
 - suitable changes

Features of GenAI-powered assistant



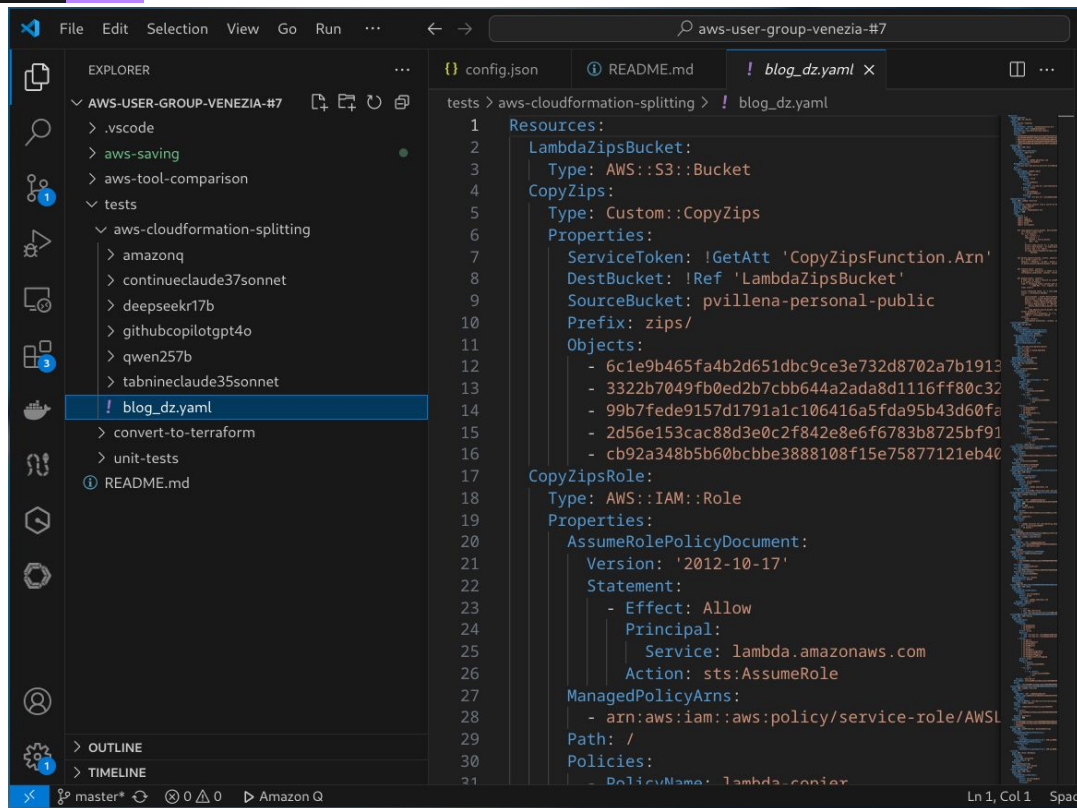
- code auto completion
- chat with code by natural language
- code generation
- code explanation
- documentation generation
- unit test generation
- find and fix bugs
- refactor

Features of GenAI-powered assistant



- code auto completion
- chat with code by natural language
- code generation
- code explanation
- documentation generation
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GenAI-powered assistant



GenAI-powered assistant

The screenshot displays the Visual Studio Code (VS Code) interface with a dark theme. The Explorer sidebar on the left shows a project structure for 'AWS-USER-GROUP-VENEZIA-#7', including files like '.vscode', 'aws-saving', 'aws-tool-comparison', 'tests', 'aws-cloudformation-splitting', 'amazonq', 'continueclaude37sonnet', 'deepseekr17b', 'githubcopilotgpt4o', 'qwen257b', 'tabnineclaude35sonnet', 'blog_dz.yaml', 'convert-to-terraform', 'unit-tests', and 'README.md'. The 'blog_dz.yaml' file is selected and open in the main editor. The file content is a CloudFormation template for 'blog_dz.yaml' within the 'tests > aws-cloudformation-splitting' directory. It defines a 'Resources' section with 'LambdaZipsBucket' (an S3 bucket) and 'CopyZips' (a custom resource). It also defines a 'CopyZipsRole' (an IAM role) and a 'ManagedPolicyArns' section. The 'Properties' section for 'CopyZips' includes 'ServiceToken', 'DestBucket', 'SourceBucket', 'Prefix', and 'Objects'. The 'Properties' section for 'CopyZipsRole' includes 'AssumeRolePolicyDocument' and 'Statement'. The 'ManagedPolicyArns' section lists the role's managed policies. The 'Path' section is set to '/'. The 'Policies' section lists the role's policies. The 'Chat' sidebar on the right is titled 'Ask Copilot' and contains the text: 'Copilot is powered by AI, so mistakes are possible. Review output carefully before use.' Below this text are instructions: 'or type # to attach context', '@ to chat with extensions', and 'Type / to use commands'. The chat input field contains the text: '/fix the problems in my code', '/tests add unit tests for my code', and '/explain how the selected code works'. The chat output field shows the response: 'blog_dz.yaml Current file'. The status bar at the bottom indicates the current file is 'blog_dz.yaml', the editor is in 'Current file' mode, and the language is 'YAML'. The status bar also shows 'Ln 1, Col 1', 'Spaces: 2', 'UTF-8', 'LF', and 'Continue' and 'Prettier' icons.

```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
12        - 6c1e9b465fa4b2d651dbc9ce3e732d8702a7b1913
13        - 3322b7049fb0ed2b7cbb644a2ada8d1116ff80c32
14        - 99b7fede9157d1791a1c106416a5fda95b43d60fa
15        - 2d56e153cac88d3e0c2f842e8e6f6783b8725bf91
16        - cb92a348b5b60bcbbe3888108f15e75877121eb40
17   CopyZipsRole:
18     Type: AWS::IAM::Role
19     Properties:
20       AssumeRolePolicyDocument:
21         Version: '2012-10-17'
22         Statement:
23           - Effect: Allow
24             Principal:
25               Service: lambda.amazonaws.com
26             Action: sts:AssumeRole
27       ManagedPolicyArns:
28         - arn:aws:iam::aws:policy/service-role/AWSLambdaRole
29       Path: /
30       Policies:
31         - PolicyName: lambda-copier
```

Ask Copilot

Copilot is powered by AI, so mistakes are possible. Review output carefully before use.

or type # to attach context
@ to chat with extensions
Type / to use commands

/fix the problems in my code
/tests add unit tests for my code
/explain how the selected code works

blog_dz.yaml Current file

Ask Copilot

@ # 🔍 GPT-4o ▾ ▾

GenAI-powered assistant

The screenshot displays the Visual Studio Code (VS Code) interface with a dark theme. The Explorer sidebar on the left shows a project structure for 'AWS-USER-GROUP-VENEZIA-#7', including files like `.vscode`, `aws-saving`, `aws-tool-comparison`, and a `tests` directory. The `blog_dz.yaml` file is selected and open in the main editor. The file contains AWS CloudFormation configuration for a `CopyZips` resource and a `CopyZipsRole`.

```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
12        - 6c1e9b465fa4b2d651dbc9ce3e732d8702a7b1913
13        - 3322b7049fb0ed2b7cbb644a2ada8d1116ff80c32
14        - 99b7fede9157d1791a1c106416a5fda95b43d60fa
15        - 2d56e153cac88d3e0c2f842e8e6f6783b8725bf91
16        - cb92a348b5b60bcbbe3888108f15e75877121eb40
17   CopyZipsRole:
18     Type: AWS::IAM::Role
19     Properties:
20       AssumeRolePolicyDocument:
21         Version: '2012-10-17'
22         Statement:
23           - Effect: Allow
24             Principal:
25               Service: lambda.amazonaws.com
26             Action: sts:AssumeRole
27       ManagedPolicyArns:
28         - arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole
29       Path: /
30       Policies:
31         - PolicyName: lambda-copier
```

On the right side of the interface, the 'Ask Copilot' panel is open. It features the Copilot logo and the text: 'Copilot is powered by AI, so mistakes are possible. Review output carefully before use.' Below this, there is a search bar with a magnifying glass icon and the text 'or type # to attach context'. Further down, there are icons for '@ to chat with extensions' and 'Type / to use commands'. At the bottom of the panel, there is a chat input area with a dropdown menu showing 'blog_dz.yaml Current file' and a 'GPT-4o' model selector.

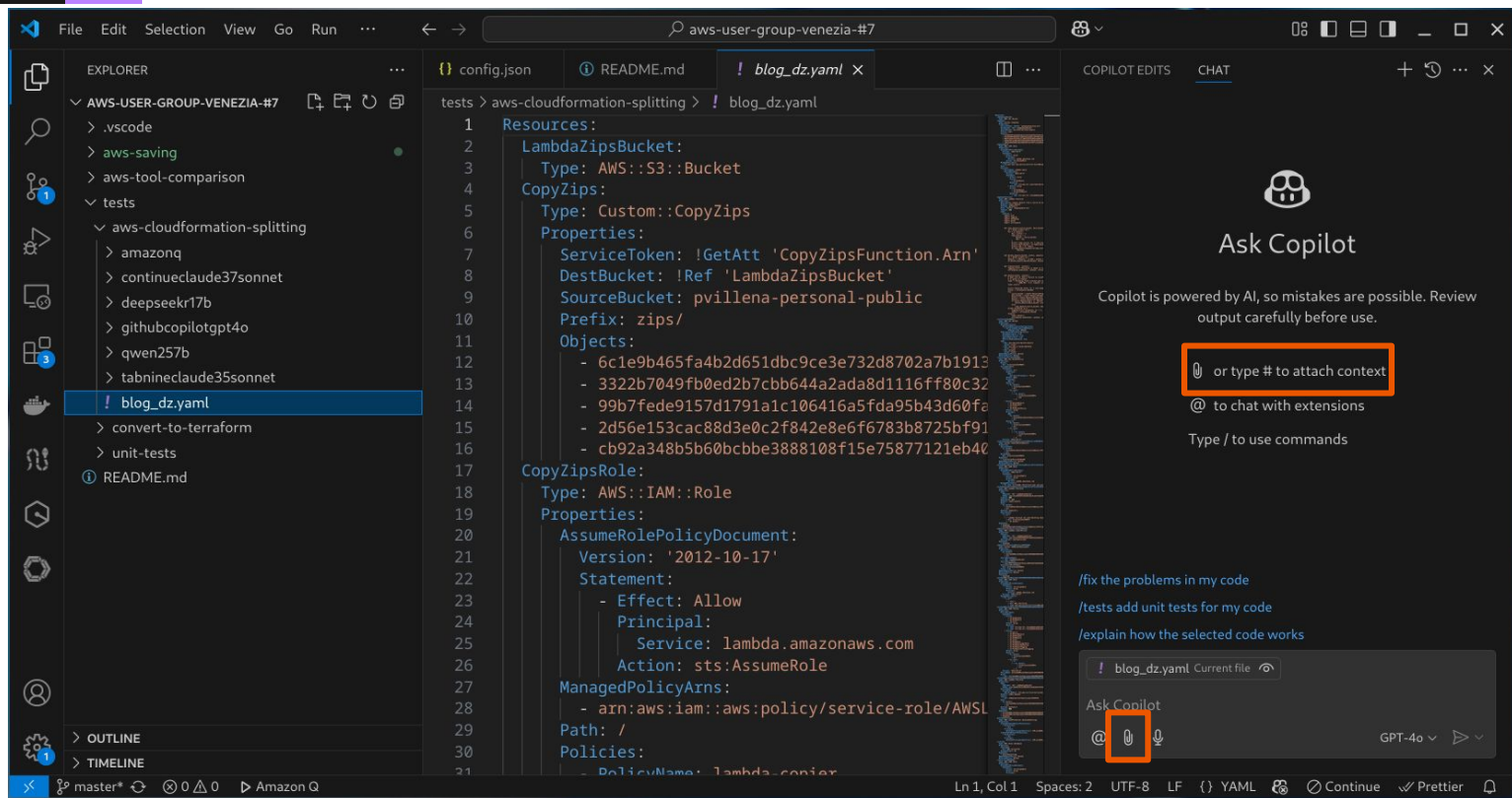
GenAI-powered assistant

The screenshot displays the Visual Studio Code editor interface. The Explorer sidebar on the left shows a project structure for 'AWS-USER-GROUP-VENEZIA-#7', with the file 'blog_dz.yaml' selected. The main editor area shows the content of 'blog_dz.yaml', which is an AWS CloudFormation template. The template includes a 'Resources' section with 'LambdaZipsBucket' (an S3 bucket) and 'CopyZips' (a custom resource for uploading code to the bucket). It also defines a 'CopyZipsRole' with an 'AssumeRolePolicyDocument' that allows the role to assume the 'lambda.amazonaws.com' role. The 'ManagedPolicyArns' section lists the 'arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole'.

On the right side of the editor, the 'COPILOT EDITS' and 'CHAT' panels are visible. The 'CHAT' panel shows the 'Ask Copilot' interface. It includes a text input field with a placeholder 'or type # to attach context' and a button '@ to chat with extensions'. Below the input field, there are several example prompts: '/fix the problems in my code', '/tests add unit tests for my code', and '/explain how the selected code works'. The third prompt is selected, and a dropdown menu shows the file 'blog_dz.yaml' with the label 'Current file'.


```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
12        - 6c1e9b465fa4b2d651dbc9ce3e732d8702a7b1913
13        - 3322b7049fb0ed2b7cbb644a2ada8d1116ff80c32
14        - 99b7fede9157d1791a1c106416a5fda95b43d60fa
15        - 2d56e153cac88d3e0c2f842e8e6f6783b8725bf91
16        - cb92a348b5b60bcbbe3888108f15e75877121eb40
17   CopyZipsRole:
18     Type: AWS::IAM::Role
19     Properties:
20       AssumeRolePolicyDocument:
21         Version: '2012-10-17'
22         Statement:
23           - Effect: Allow
24             Principal:
25               Service: lambda.amazonaws.com
26             Action: sts:AssumeRole
27       ManagedPolicyArns:
28         - arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole
29       Path: /
30       Policies:
31         - PolicyName: lambda-copyer
```

GenAI-powered assistant



The screenshot shows the Visual Studio Code editor with the AWS Copilot chat interface open on the right. The chat window is titled "Ask Copilot" and displays the following text:

Copilot is powered by AI, so mistakes are possible. Review output carefully before use.

 or type # to attach context

@ to chat with extensions

Type / to use commands

Below this text, there are three example commands:

- /fix the problems in my code
- /tests add unit tests for my code
- /explain how the selected code works

The chat input field at the bottom shows the file `blog_dz.yaml` selected, with the "Current file" label. The input field also contains the text `@` and `/` icons, and a dropdown menu showing "GPT-4o".

The background shows the VS Code editor with the file `blog_dz.yaml` open, displaying YAML configuration for an AWS Lambda function. The Explorer sidebar on the left shows the project structure, including the `tests` folder and the `blog_dz.yaml` file.

GenAI-powered assistant

The screenshot shows the Visual Studio Code editor interface for a project named 'aws-user-group-venezia-#7'. The Explorer sidebar on the left shows the project structure, including folders like '.vscode', 'aws-saving', 'aws-tool-comparison', and 'tests'. The 'tests' folder is expanded, showing subfolders like 'aws-cloudformation-splitting' and 'blog_dz.yaml'. The main editor area displays the 'blog_dz.yaml' file, which contains AWS CloudFormation configuration for a 'CopyZips' resource and a 'CopyZipsRole'. The Copilot chat interface is open on the right, showing the 'Ask Copilot' prompt and a list of commands like '/fix the problems in my code', '/tests add unit tests for my code', and '/explain how the selected code works'. A red box highlights the '@' icon in the chat input area, which is used to attach context to the chat.

File Edit Selection View Go Run ... → aws-user-group-venezia-#7

EXPLORER

- ▼ AWS-USER-GROUP-VENEZIA-#7
 - > .vscode
 - > aws-saving
 - > aws-tool-comparison
 - ▼ tests
 - ▼ aws-cloudformation-splitting
 - > amazonq
 - > continueclaude37sonnet
 - > deepseekr17b
 - > githubcopilotgpt4o
 - > qwen257b
 - > tabnineclaude35sonnet
 - ! blog_dz.yaml
 - > convert-to-terraform
 - > unit-tests
 - ① README.md

tests > aws-cloudformation-splitting > ! blog_dz.yaml

```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
12        - 6c1e9b465fa4b2d651dbc9ce3e732d8702a7b1913
13        - 3322b7049fb0ed2b7cbb644a2ada8d1116ff80c32
14        - 99b7fede9157d1791a1c106416a5fda95b43d60fa
15        - 2d56e153cac88d3e0c2f842e8e6f6783b8725bf91
16        - cb92a348b5b60bcbbe3888108f15e75877121eb40
17   CopyZipsRole:
18     Type: AWS::IAM::Role
19     Properties:
20       AssumeRolePolicyDocument:
21         Version: '2012-10-17'
22         Statement:
23           - Effect: Allow
24             Principal:
25               Service: lambda.amazonaws.com
26             Action: sts:AssumeRole
27       ManagedPolicyArns:
28         - arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole
29       Path: /
30       Policies:
31         - PolicyName: lambda-copier
```

COPILOT EDITS CHAT

Ask Copilot

Copilot is powered by AI, so mistakes are possible. Review output carefully before use.

🗨 or type # to attach context
@ to chat with extensions
Type / to use commands

/fix the problems in my code
/tests add unit tests for my code
/explain how the selected code works

! blog_dz.yaml Current file

Ask Copilot

@ 🗨 🗨 GPT-4o ▾ ▾

Ln1, Col1 Spaces: 2 UTF-8 LF {} YAML ⚙️ ⌂ Continue Prettier 🔔

GenAI-powered assistant

The screenshot displays the Visual Studio Code (VS Code) interface with a project named 'aws-user-group-venezia-#7'. The Explorer sidebar on the left shows the project structure, including folders like '.vscode', 'aws-saving', 'aws-tool-comparison', and 'tests'. The 'tests' folder is expanded, showing subfolders like 'aws-cloudformation-splitting' and 'blog_dz.yaml'. The main editor area shows the 'blog_dz.yaml' file, which contains AWS CloudFormation configuration for a 'CopyZips' function and a 'CopyZipsRole'. The configuration includes details for 'Resources', 'Properties', 'ManagedPolicyArns', and 'Policies'. The right sidebar features the 'Ask Copilot' chat interface, which is powered by AI. It includes a prompt area with suggestions like '/fix the problems in my code', '/tests add unit tests for my code', and '/explain how the selected code works'. The chat interface also shows a list of recent prompts and a 'Type / to use commands' button.

```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
12        - 6c1e9b465fa4b2d651dbc9ce3e732d8702a7b1913
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or type # to attach context

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Ask Copilot

@ #

GPT-4o

GenAI-powered assistant

The screenshot shows the Visual Studio Code editor interface for a project named 'aws-user-group-venezia-#7'. The Explorer sidebar on the left shows the project structure, including a 'tests' directory with an 'aws-cloudformation-splitting' subdirectory. The 'blog_dz.yaml' file is selected in the Explorer and is also the active file in the editor. The editor displays the YAML content of 'blog_dz.yaml', which defines AWS resources: 'LambdaZipsBucket', 'CopyZips' (a custom resource), 'CopyZipsRole', and 'ManagedPolicyArns'. The 'CopyZips' resource is currently selected, and its properties are visible in the editor. On the right side of the editor, the 'Ask Copilot' chat interface is open. It features a header with the Copilot logo and the text 'Ask Copilot'. Below this, a message states: 'Copilot is powered by AI, so mistakes are possible. Review output carefully before use.' There are three input prompts: 'or type # to attach context', '@ to chat with extensions', and 'Type / to use commands'. A text input field at the bottom contains the prompt: '/fix the problems in my code /tests add unit tests for my code /explain how the selected code works'. The status bar at the bottom shows the current file is 'blog_dz.yaml', the current file is selected, and the editor is using the 'GPT-4o' model.

```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
8       DestBucket: !Ref 'LambdaZipsBucket'
9       SourceBucket: pwillena-personal-public
10      Prefix: zips/
11      Objects:
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@ # 🔍 GPT-4o ▾ ▾

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```
1 Resources:
2   LambdaZipsBucket:
3     Type: AWS::S3::Bucket
4   CopyZips:
5     Type: Custom::CopyZips
6     Properties:
7       ServiceToken: !GetAtt 'CopyZipsFunction.Arn'
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Ask Copilot

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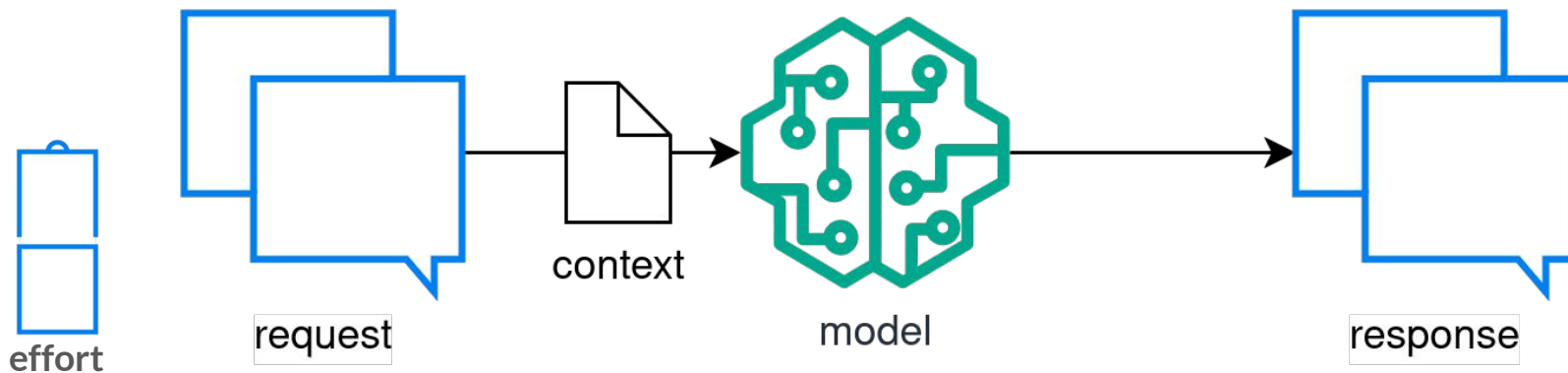
/fix the problems in my code
/tests add unit tests for my code
/explain how the selected code works

! blog_dz.yaml Current file

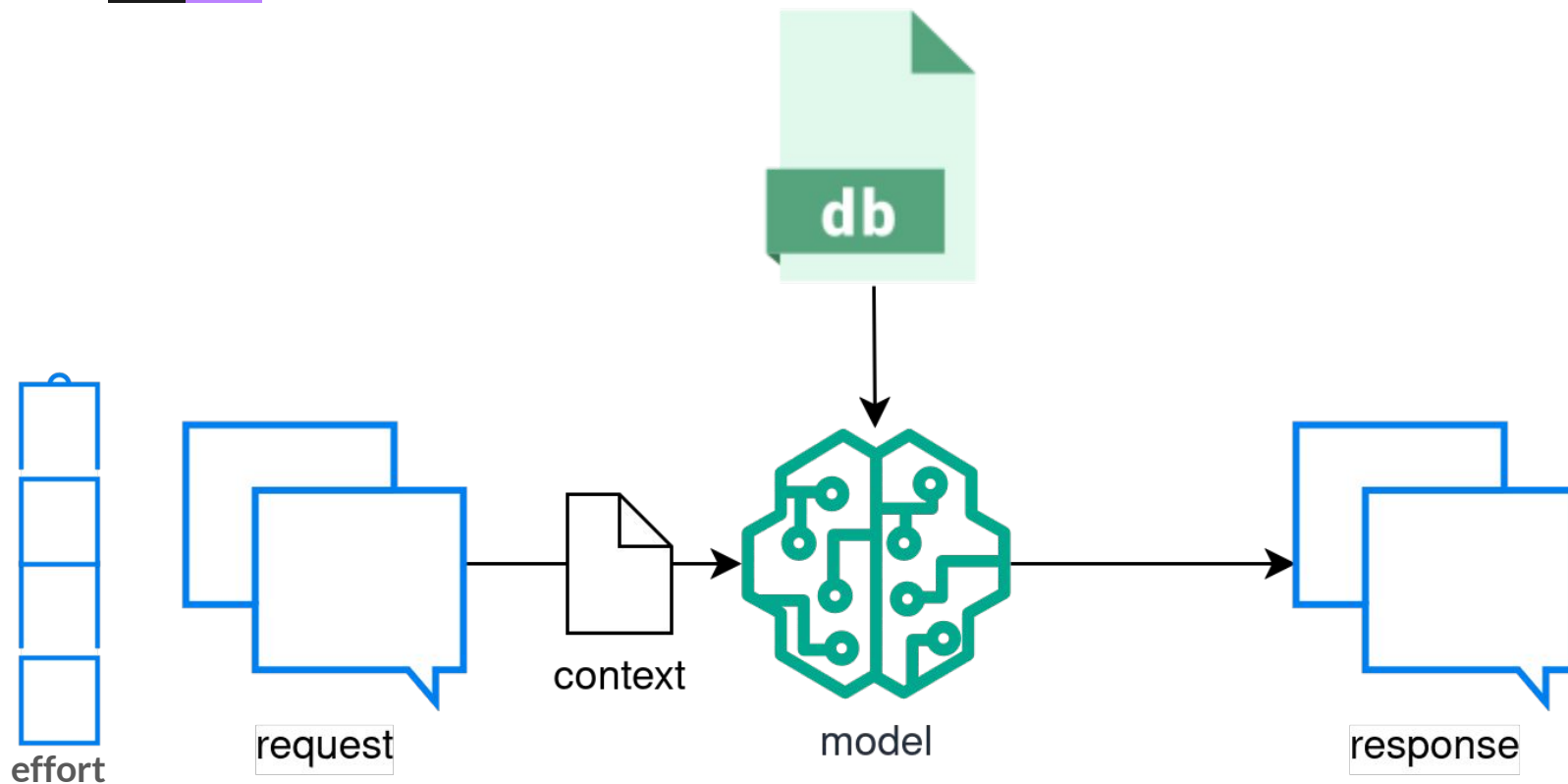
Ask Copilot

@ 📎 🗑️ GPT-4o ➤

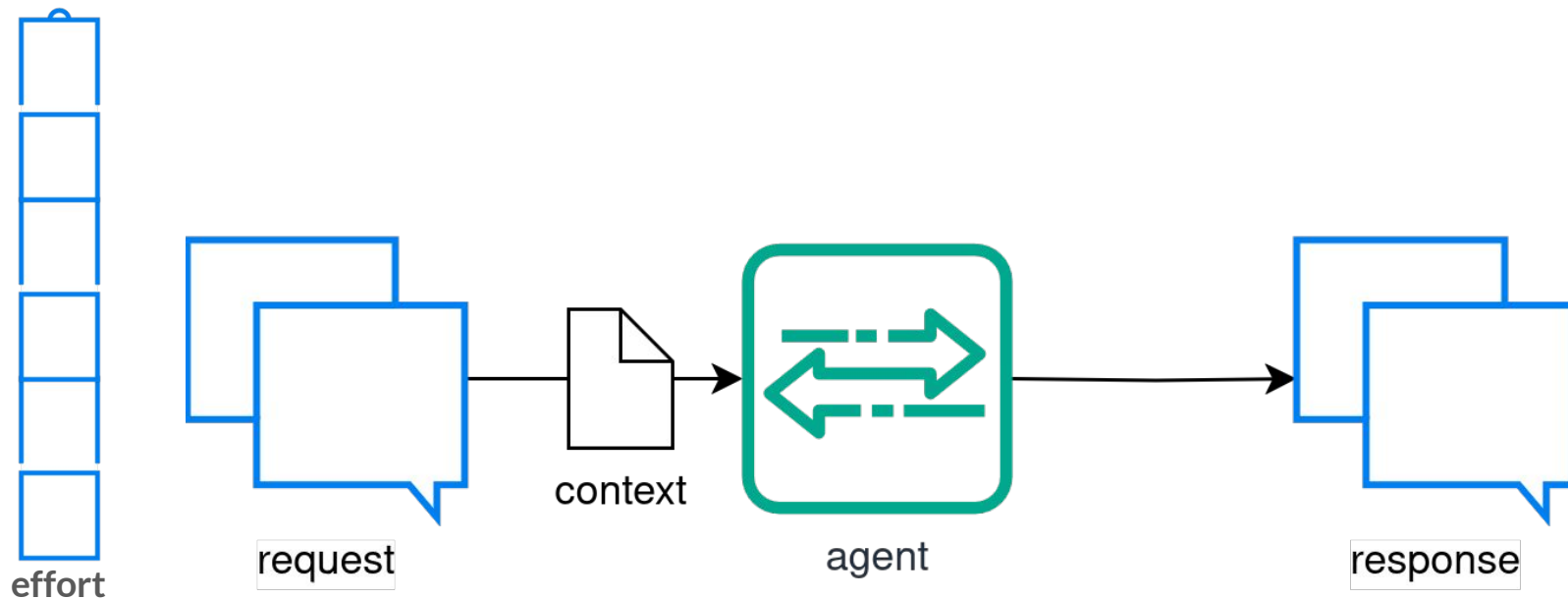
GenAI-powered assistant



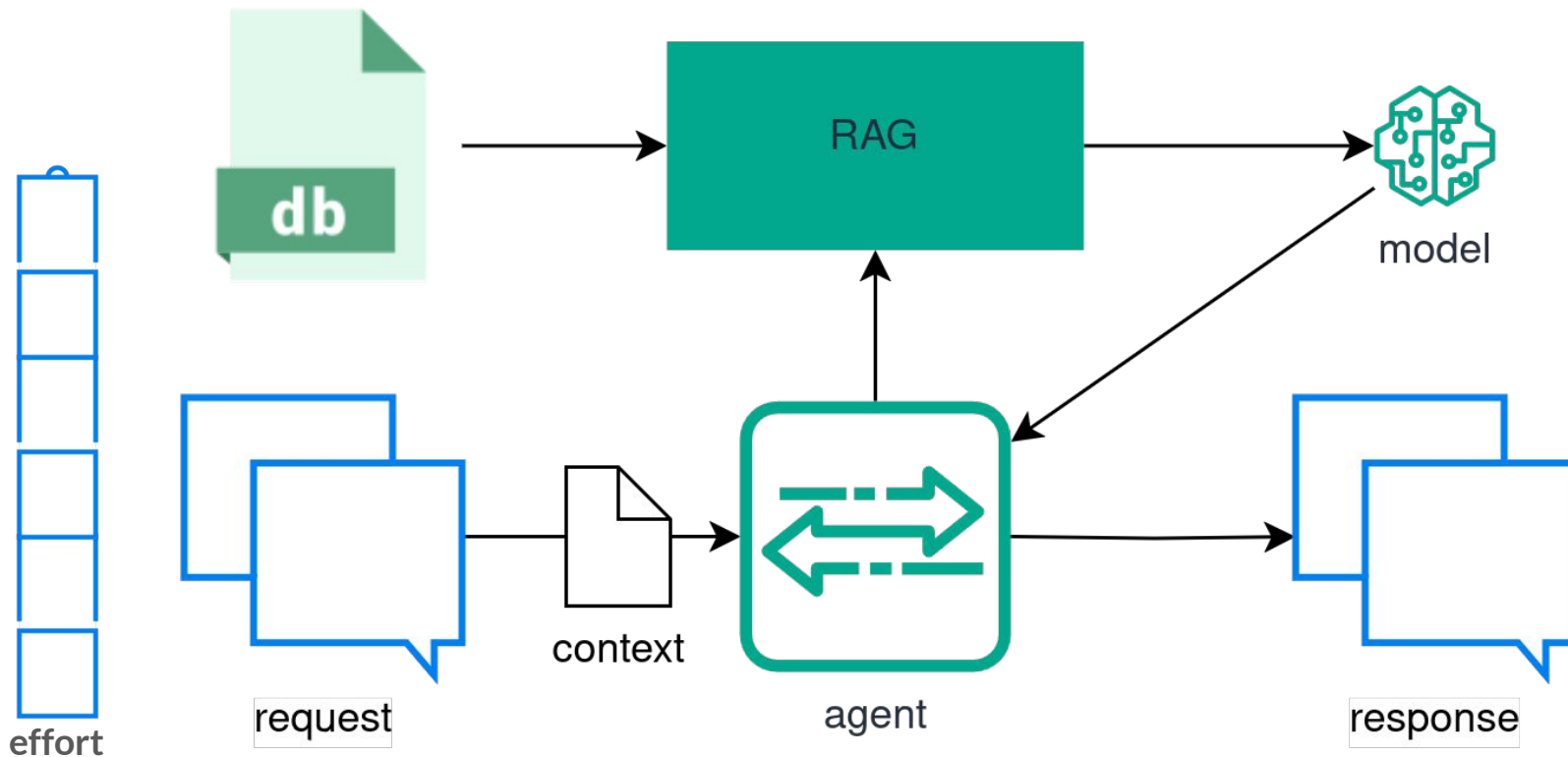
GenAI-powered assistant

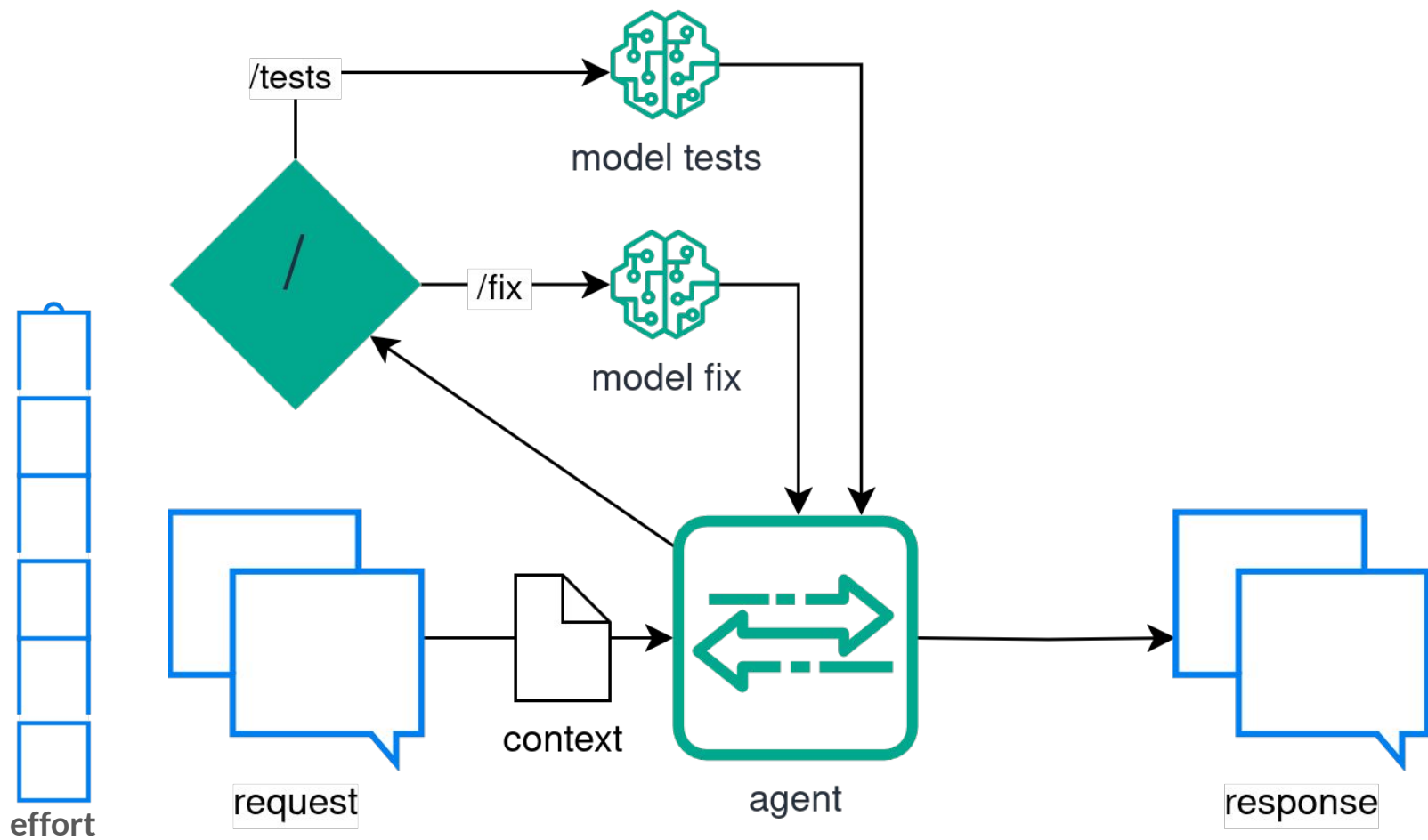


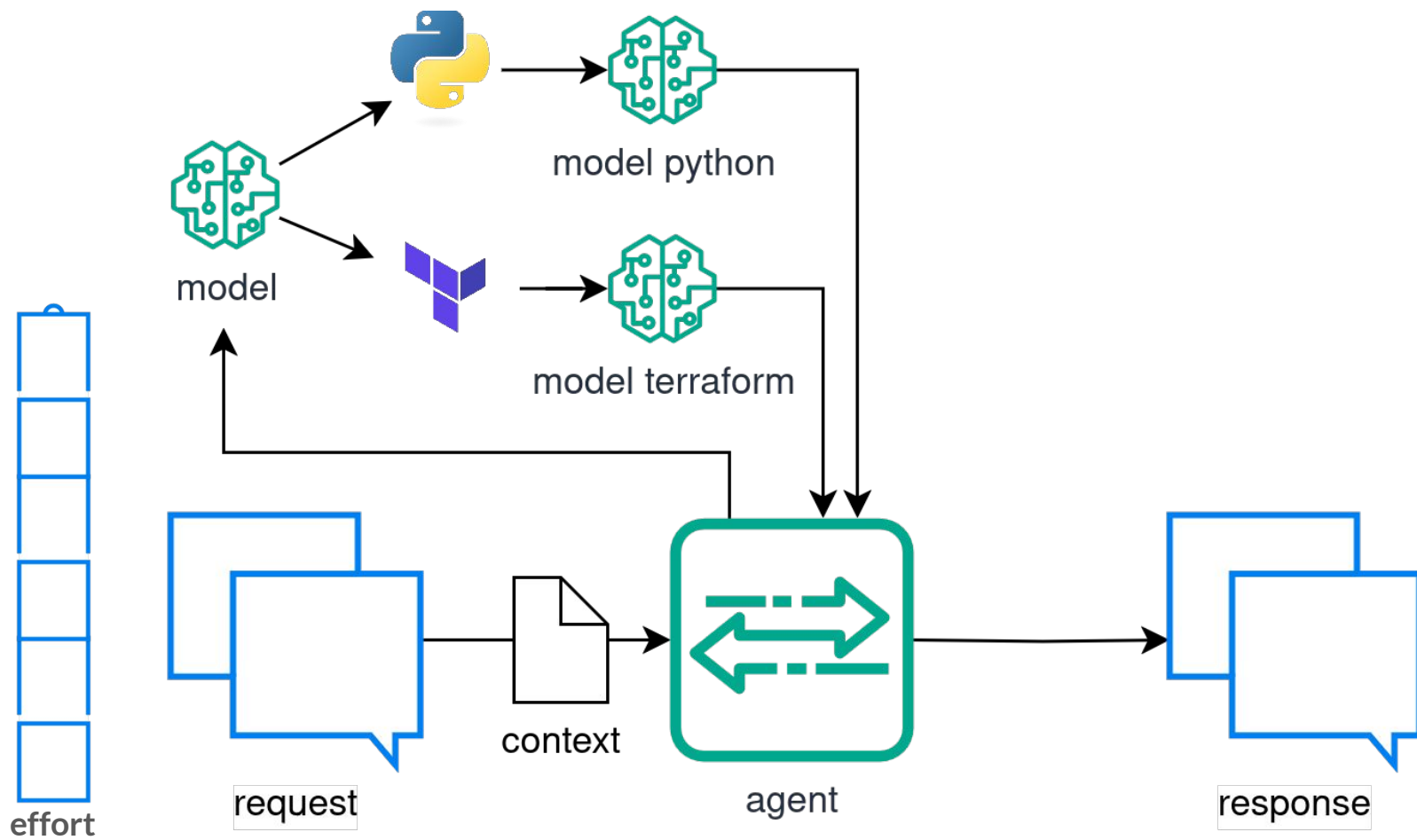
GenAI-powered assistant



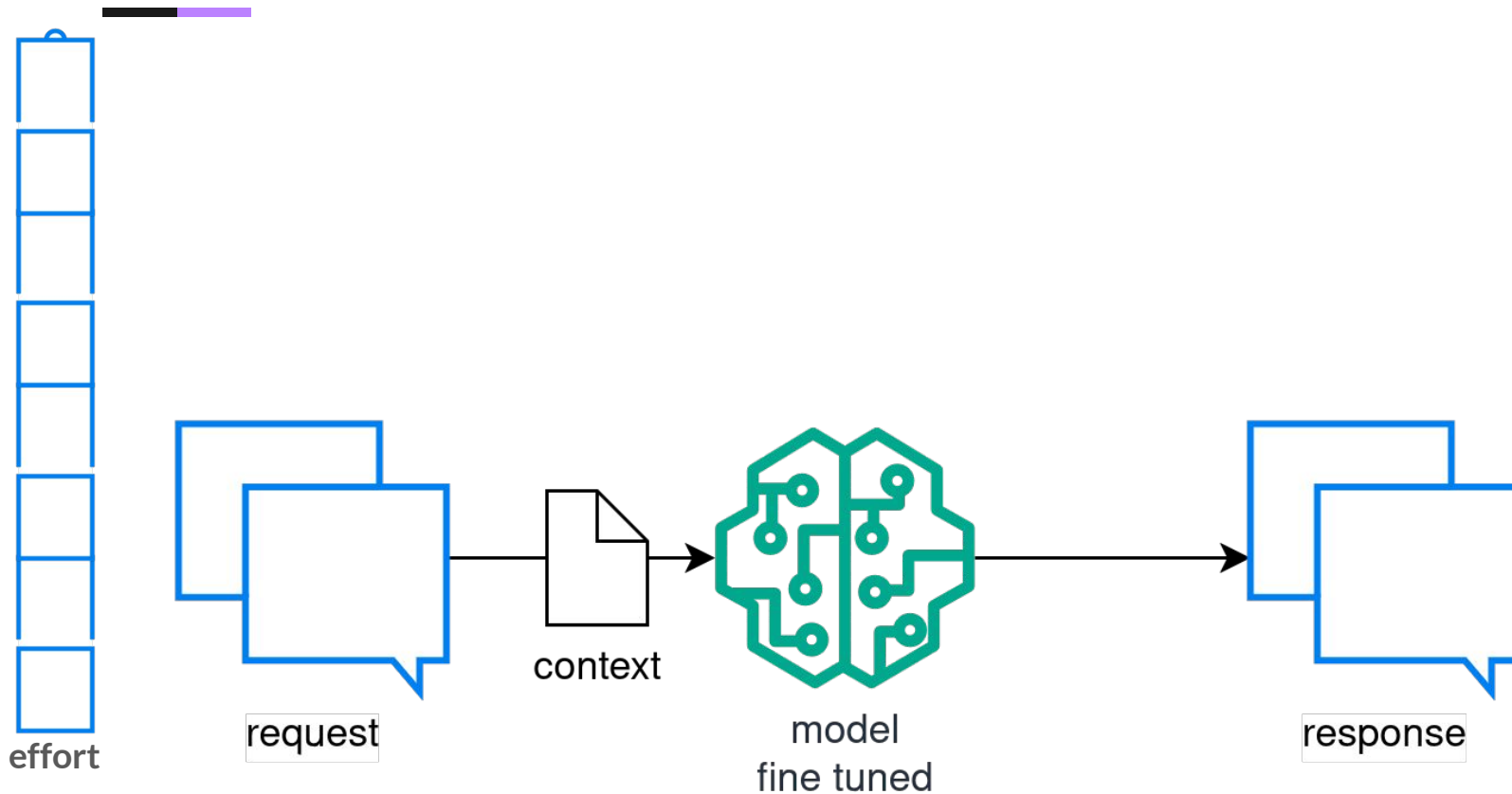
GenAI-powered assistant



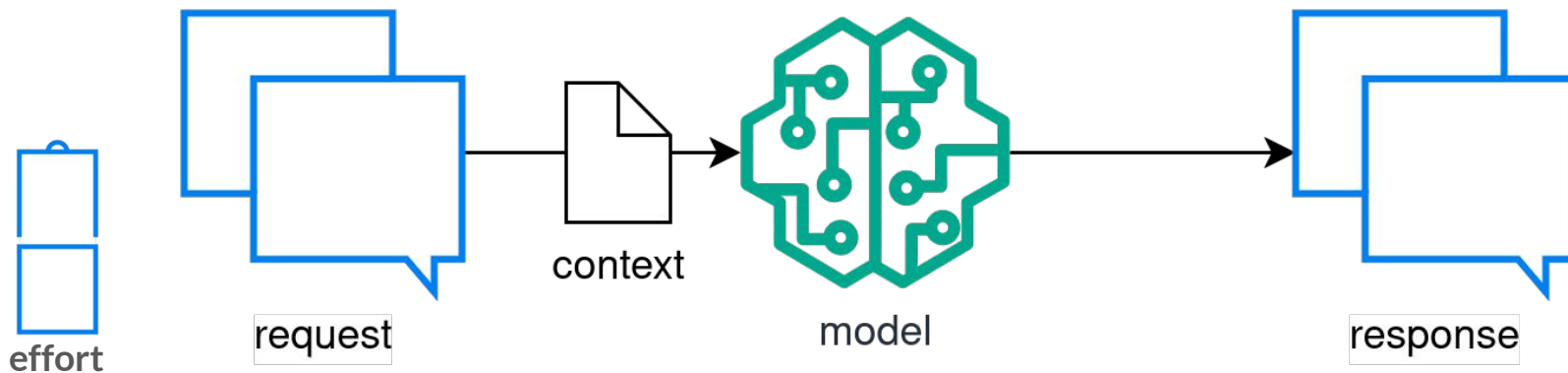




GenAI-powered assistant



GenAI-powered assistant



Solutions

Models

<https://lmarena.ai/>

Category		Apply filter		Coding: whether conversation contains code snippets			
Coding		<input type="checkbox"/> Style Control <input type="checkbox"/> Show Deprecated		#models: 206 (97%) #votes: 539,528 (19%)			
Rank* (UB)	Delta	Model	Arena Score	95% CI	Votes	Organization	License
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1	0	GPT-4.5-Preview	1413	+17/-14	1102	OpenAI	Proprietary
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3	6	o3-mini-high	1369	+13/-15	2099	OpenAI	Proprietary
3	3	DeepSeek-R1	1369	+16/-14	1836	DeepSeek	MIT
3	0	ChatGPT-4o-latest (2025-01-29)	1367	+12/-12	3714	OpenAI	Proprietary
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3	3	o1-2024-12-17	1359	+10/-9	4111	OpenAI	Proprietary
3	11	o3-mini	1353	+14/-9	3319	OpenAI	Proprietary
4	5	o1-preview	1355	+7/-9	6702	OpenAI	Proprietary
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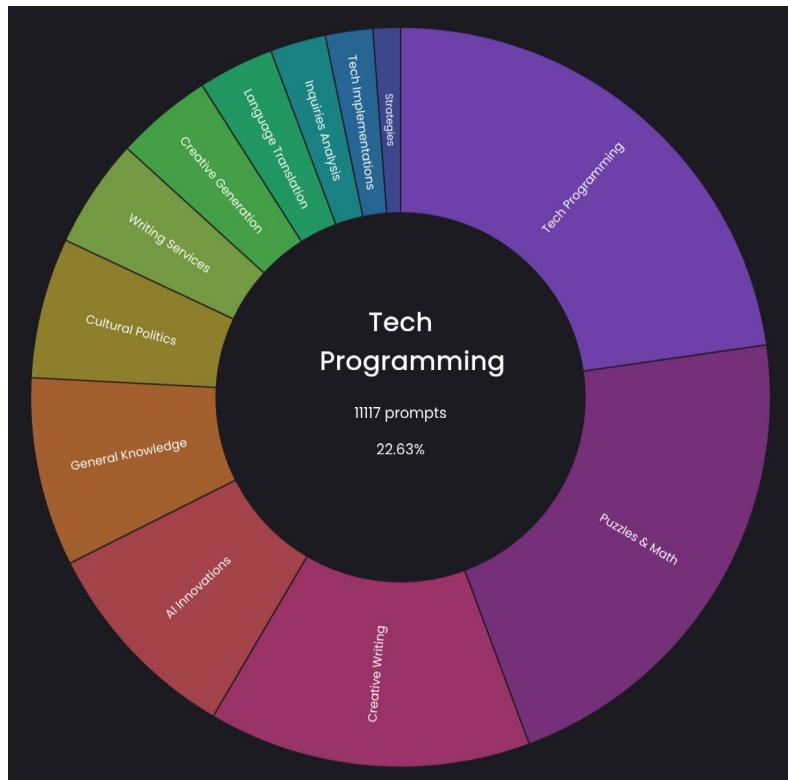
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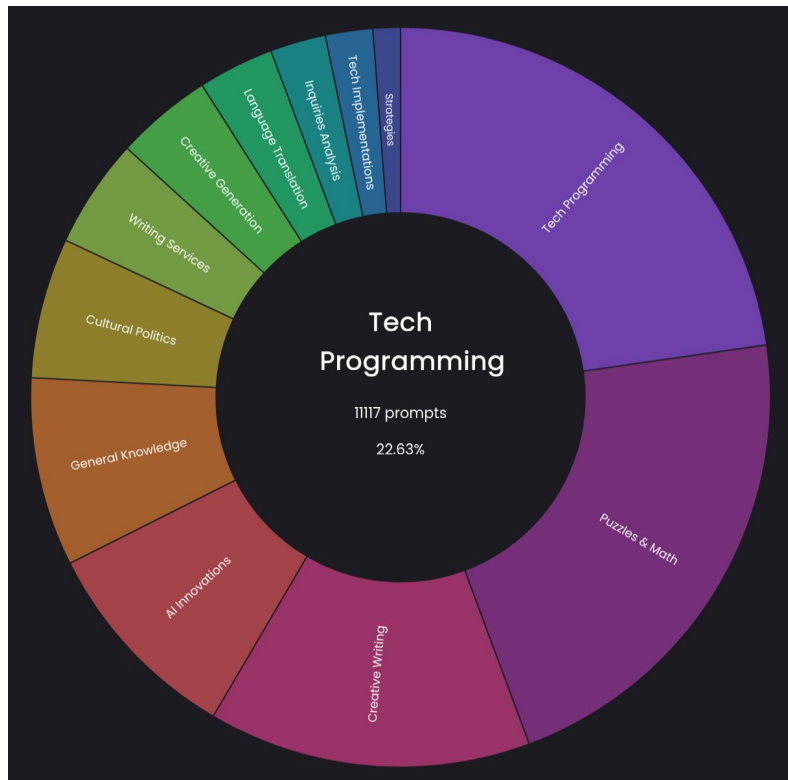
Models

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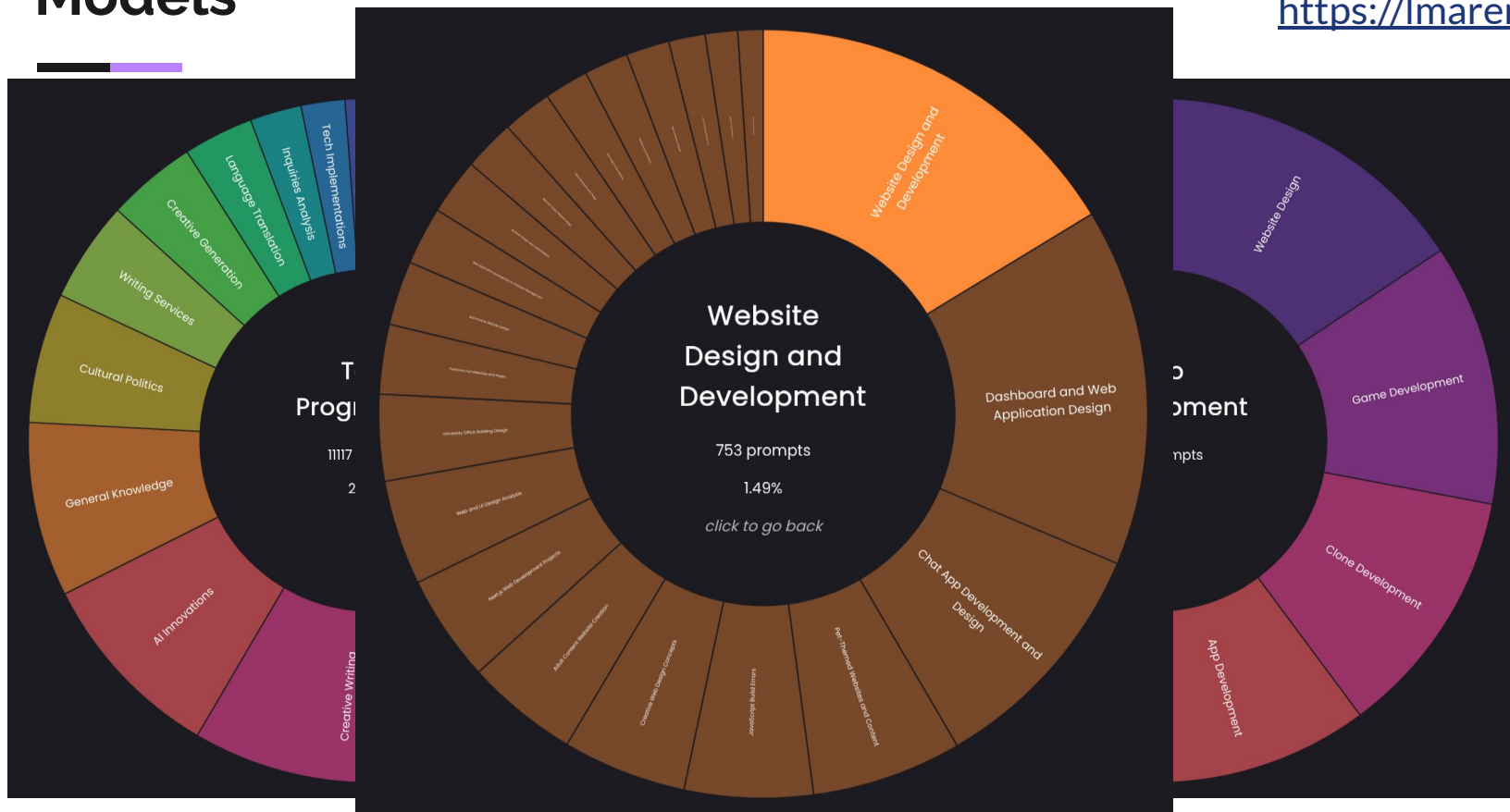


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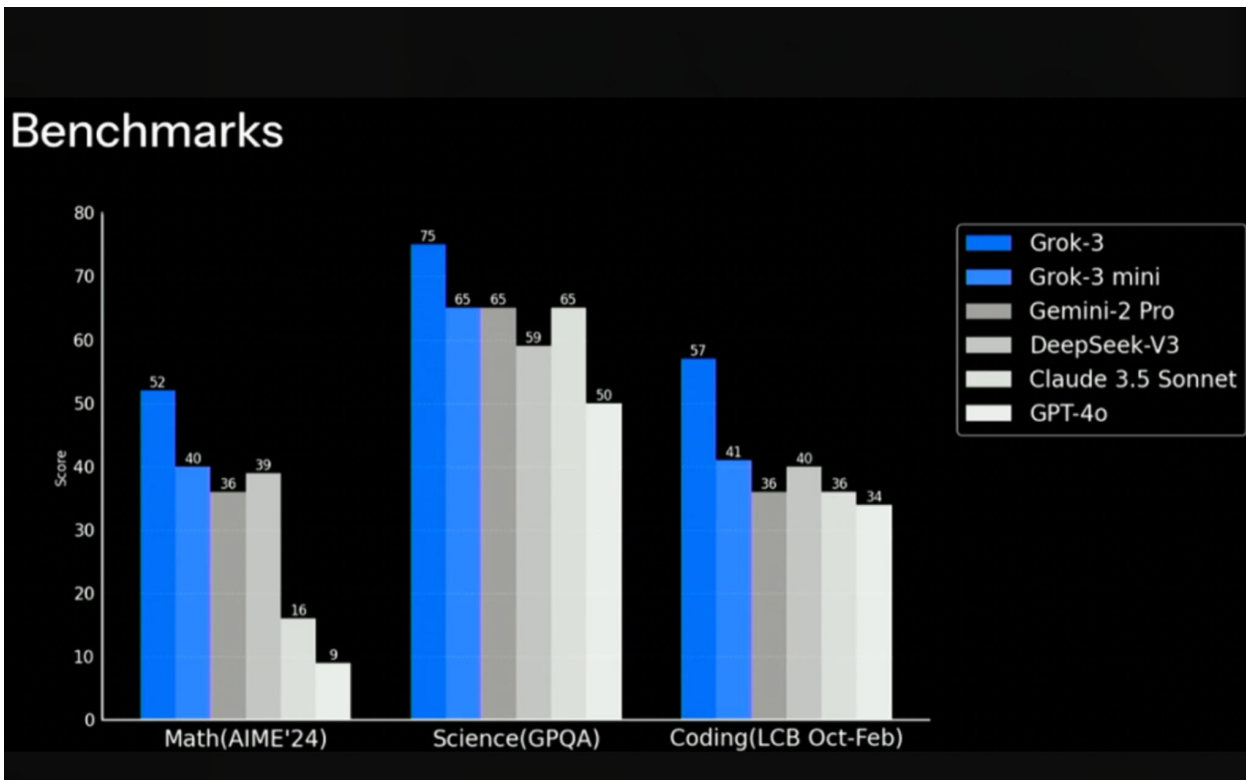


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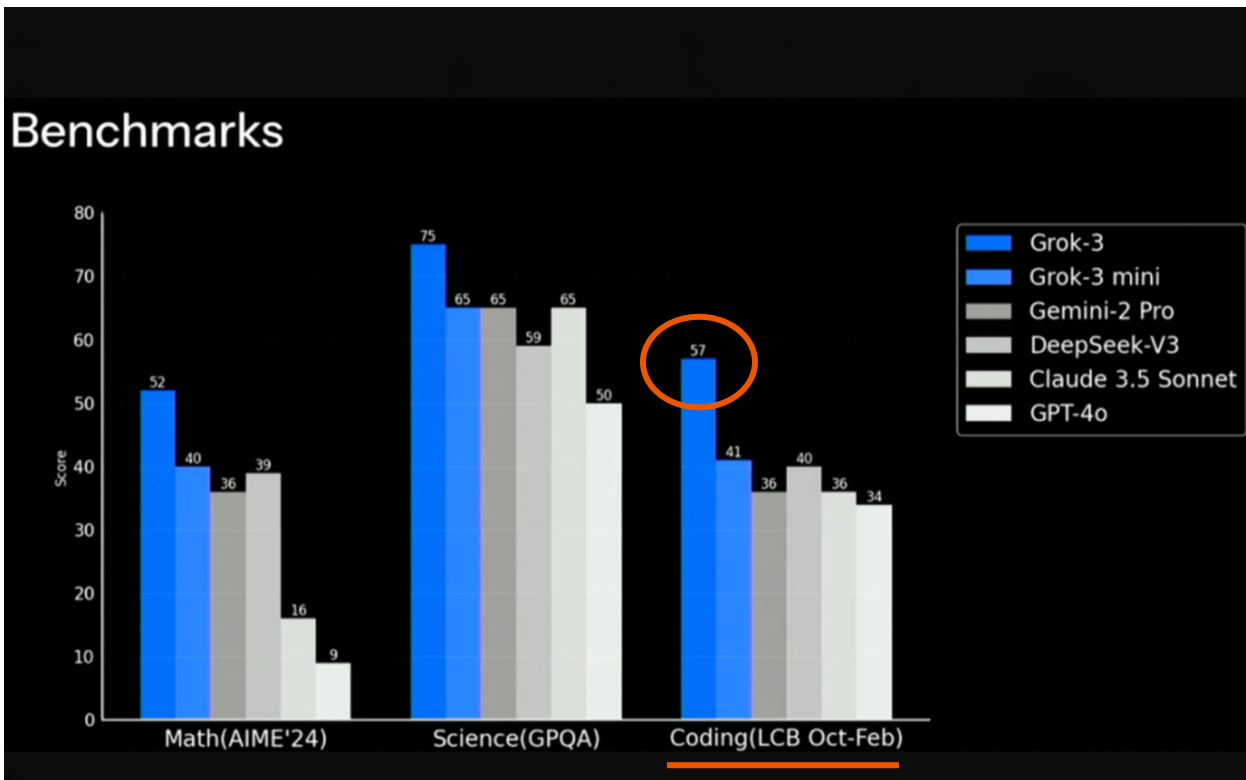
Models

<https://huggingface.co/blog/LLMhacker/grok-3-ai>



Models

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Models



<https://x.ai/api>

Grok 3 coming soon

We're working hard to bring Grok 3 to the API. We'll be rolling out access soon.

READ MORE ↗

Looking for VS Code Extensions



Looking for VS Code Extensions

- AI Toolkit for Visual Studio Code

Looking for VS Code Extensions

- AI Toolkit for Visual Studio Code



Filters applied

- ☐ Mistral AI
- ☐ Microsoft
- ☐ DeepSeek
- ☐ AI21 Labs
- ☐ Cohere
- ☐ Core42
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- <https://www.analyticsvidhya.com/blog/2024/09/generative-ai-coding-extensions-in-vs-code/> - updated 01/2025

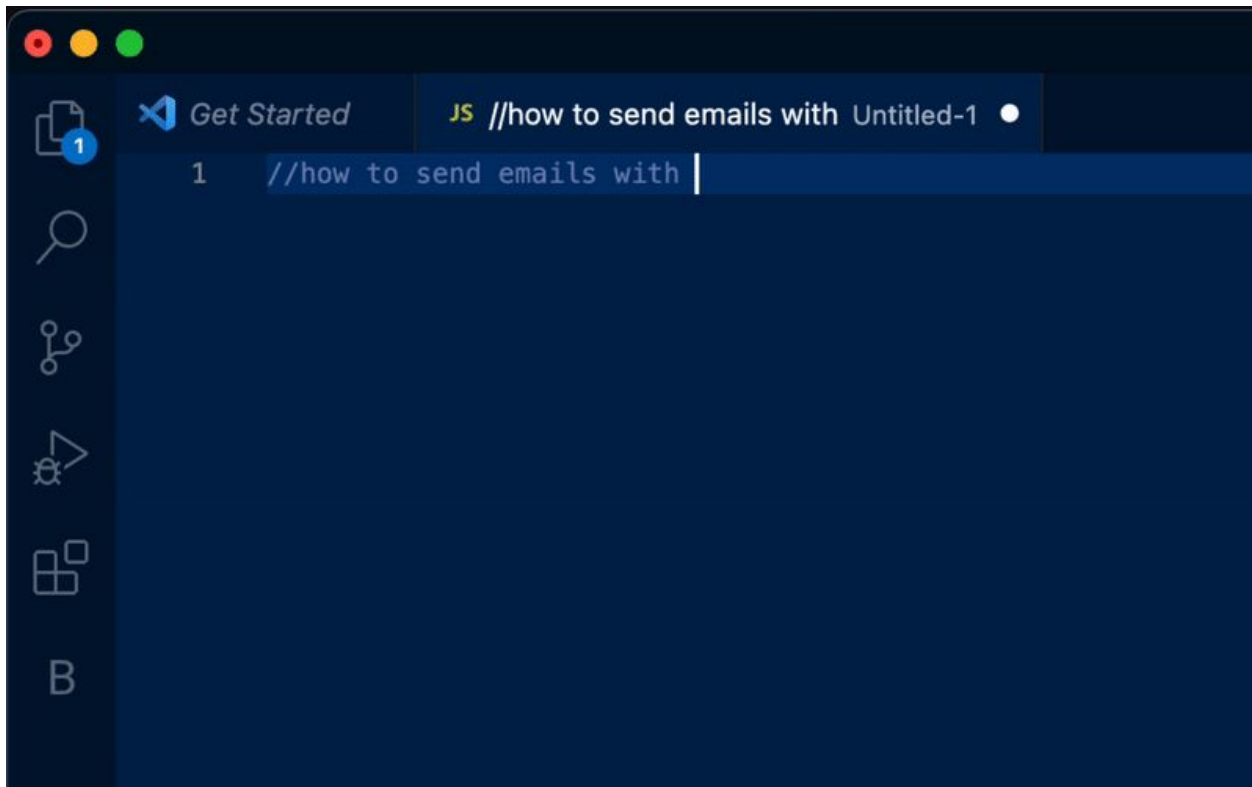
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Codeium	Free for Base Model using llama3.1	No model choice, internet needed	4.9	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supermaven	Free version uses inhouse Babble Model	Pro version offers Latest OpenAI, Sonnet and Claude Models	4.6	Yes	Yes	Yes	Yes	Yes	Yes	No
Continue	Free	Can use local or cloud models	4.5	Yes	Yes	Yes	Yes	Yes	Yes	No
Amazon Q Developer	Free version allows limited interactions	Amazon Bedrock is available for all; the Paid version allows other models	4.4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cody	Free version supports limited chats	Use Local Models using Ollama. Free version uses models like Sonnet3.5, Gemini Pro, Flash & Mistral The paid version offers the latest Open AI and Claude models too	4.3	Yes	Yes	Yes	Yes	Yes	Yes	No
Tabnine	Free 90 Day Trial	Two custom-built, fully private models from Tabnine, plus popular LLMs from Cohere, Anthropic, Mistral, GPT-4o, & OpenAI	4.2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Blackbox AI	Free	Limited models.	4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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Feature Inline chat



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Use cases



- unit tests
 - new file per unit tests
 - new unit tests
- generate a method
 - new method
 - improvement method
- convert to Terraform
 - all in one
 - one piece at a time
- split templates
 - by model
 - by model + documentation

Use cases



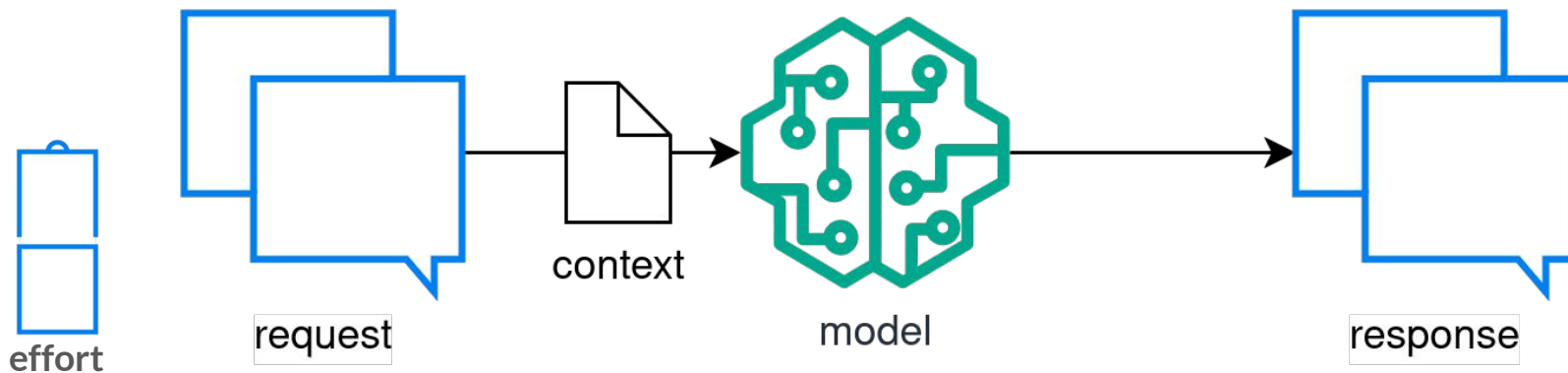
Dev

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Ops

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GenAI-powered assistant



Generate a method

```
def get_value(self, list, label):  
    """  
    gets the value of the tag requested  
    Args:  
        list (dictionary): list of tags  
        label (string): label of the Key of the tag requested  
    Returns:  
        A string value of the variable named label  
    """  
    for tag in list:  
        if tag['Key'].lower() == label:  
            return tag['Value']  
    return None
```

Looking for the prompts - generate a method

Create a method of a class in python 3.9 with this details: the method gets the value of the tag requested by a label that is the key

Args:

- list (dictionary): list of tags, example: [{"Key": "Saving", "Value": "Enabled"}, {"Key": "stop", "Value": "enabled"}]
- label (string): label of the Key of the tag requested

Returns: A string value of the variable named label or None

Pay attention: the label will be passed always in lower case.

Looking for the prompts - unit test



Create a file named `test_service_copy.py` for unit tests with the import `unittest` package and the class `TestServiceCopy` which extends the class target `ServiceCopy` and the `__init__` method correctly configured only with `TestCase` initialization

`/test` create a unit test for the method `get_value` of `@service_copy.py` with `unittest` module to add in the file `@test_service_copy.py`

`/test` add unit tests in `@test_service_copy.py` for the method `is_time_to_act` of `@service_copy.py` with `unittest` module

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Looking for the prompts - convert to terraform



Convert files @lambda-plus.yaml and @sns-plus.yaml that they contain cloudformation templates in the directory terraform with terraform templates

Organize the resources in four files named: terraform.tfvars, variables.tf, main.tf and outputs.tf

Can you merge lambda objects and sns objects in a unique terraform structure with only 4 files ?

Looking for the prompts - convert to terraform

To use this configuration:

1. Initialize Terraform: `terraform init`
2. Review the planned changes: `terraform plan`
3. Apply the configuration: `terraform apply`
4. To destroy the resources: `terraform destroy`

Remember to:

- A. Update the `terraform.tfvars` file with your specific values
- B. Ensure your AWS credentials are properly configured
- C. Review and adjust the IAM permissions as needed for your use case

Looking for the prompts - split templates



Split the blog_dz.yaml file in one file per AWS service

Adding all template sections to work properly:
AWSTemplateFormatVersion, Description, Parameters, Resources, Outputs

Make sure you reuse all the objects from the blog_dz.yaml file

Create a main file with the sections: AWSTemplateFormatVersion, Transform, Description, Parameters and Resources;
in Parameters section add all parameters to pass to each object of Resources section;
in the Resources section add one `AWS::Serverless::Application` objects for each file created with all parameters used in that file

Code explanation - split templates

1. I've organized the resources by AWS service and created separate templates for S3, IAM, Glue, and DataZone resources.
 2. The main template uses `AWS::Serverless::Application` to reference the nested stacks.
 3. Parameters are passed between stacks using the `GetAtt` function on the stack outputs.
 4. Each template includes its own `AWSTemplateFormatVersion` and `Description`.
 5. The main template includes the `Serverless` transform to enable the use of `AWS::Serverless::Application`.
 6. I've simplified some of the resources and removed duplicates to make the structure clearer.
-
- A. Package all the templates in the same directory
 - B. Deploy the main template using `AWS SAM` or `CloudFormation`
 - C. The main template will orchestrate the creation of all resources in the proper order based on the dependencies defined in the parameters

You may need to adjust some of the references and dependencies based on your specific requirements, but this structure provides a good starting point for organizing the infrastructure code.

Code explanation - split templates

Sure, here's a proposed directory structure for an AWS CloudFormation project:

```
▼ aws-cloudformation-splitting
  ▼ templates
    ! blog_dz_main.yaml
    ! s3.yaml
    ! iam.yaml
    ! lambda.yaml
    ! datazone.yaml
    ! glue.yaml
    ! outputs.yaml
  {} package.json
  tsconfig.json
  ⓘ README.md
```

Create Workspace...



Code explanation - split templates

Sure, here's a proposed directory structure for an AWS CloudFormation project:

```
▼ aws-cloudformation-splitting
  ▼ templates
    ! blog_dz_main.yaml
    ! s3.yaml
    ! iam.yaml
    ! lambda.yaml
    ! datazone.yaml
    ! glue.yaml
    ! outputs.yaml
    {} package.json
    tsconfig.json
    README.md
```

Create Workspace...



**I'm sorry, I am unable to
respond further. Perhaps
we could find another
topic to discuss ?**

—

Evaluation



- unit tests
 - new file for unit tests
 - new tests for a method
- generate a method
 - new method
 - improvement method
- convert to Terraform
 - all in one
 - specifying 4 files
- split templates
 - template structure
 - how many objects reused

Results

GitHub Copilot, [Continue.dev](#)

Assistants \ Evaluation	generate a method
Amazon Q Developer	7 / 11
DeepSeek R1 7b 🏠	9 / 11
GPT-4o	7 / 11
Gemini 2.0 Flash	10 / 11
o3-mini	8 / 11
Claude 3.7 Sonnet	7 / 11
Qwen 2.5 7b 🏠	8 / 11

Results

GitHub Copilot, [Continue.dev](#)

Assistants \ Evaluation	generate a method
Amazon Q Developer	7 / 11
DeepSeek R1 7b 🏠	9 / 11
GPT-4o	7 / 11
Gemini 2.0 Flash	10 / 11
o3-mini	8 / 11
Claude 3.7 Sonnet	7 / 11
Qwen 2.5 7b 🏠	8 / 11

1. Create method

- 1 point, use lower
- 1 point, use lower only on Key
- 1 point, return Value
- 1 point, return None

2. Create pluses

- 1 point, check if Key and Value attributes are in the dictionary
- 1 point, check if tag_list and label are ok else return None or raise an exception
- 1 point, multi-line docstring (PEP 257)
- 1 point, function annotations (PEP 484)
- 1 point, use if `name == "main"`
- 1 point, create example usage
- 1 point, create class

Results

GitHub Copilot, [Continue.dev](https://continue.dev)

Evaluation Assistants	generate a method	unit tests
Amazon Q Developer	7 / 11	8 / 16
DeepSeek R1 7b 🏠	9 / 11	0 / 16
GPT-4o	7 / 11	8 / 16
Gemini 2.0 Flash	10 / 11	12 / 16
o3-mini	8 / 11	5 / 16
Claude 3.7 Sonnet	7 / 11	10 / 16
Qwen 2.5 7b 🏠	8 / 11	2 / 16

Results

Assistants \ Evaluation	generate a method	unit tests
Amazon Q Developer	7 / 11	8 / 16
DeepSeek R1 7b 🏠	9 / 11	0 / 16
GPT-4o	7 / 11	8 / 16
Gemini 2.0 Flash	10 / 11	12 / 16
o3-mini	8 / 11	5 / 16
Claude 3.7 Sonnet	7 / 11	10 / 16
Qwen 2.5 7b 🏠	8 / 11	2 / 16

GitHub Copilot, [Continue.dev](https://continue.dev)

1. Create file

- 1 point, use of arguments correctly
- 1 point, if it generates `__init__` or `setUp` method
- 1 point, if only `__init__` method
- 1 point, if `unittest.TestCase.__init__()` is used correctly

2. Create unit tests for `get_value` method

- 1 point, for empty list with `assertIsNone()`
- 1 point, for `non_existent_label` with `assertIsNone()`
- 1 point, get value correctly knowing it is case sensitive
- 1 point, for creating one unit test per method correctly named `test_{method name}`
- -1 point, repeated unit tests

3. Create unit tests for `is_time_to_act` method

- 1 point, use of arguments correctly
- 1 point, for empty value with `assertFalse()`
- 1 point, for invalid string value with `assertFalse()`
- 1 point, for invalid crontab (February 31st) value with `assertFalse()`
- 1 point, for valid value with `assertTrue()`
- 1 point, for valid value not match with `assertFalse()`
- 1 point, change `date_tuple` for testing `assertTrue()` and `assertFalse()`
- 1 point, for creating one unit test per method correctly named `test_{method name}`
- -1 point, repeated unit tests

Results

GitHub Copilot, [Continue.dev](https://continue.dev)

<div><div></div><div></div></div> <div>Evaluation Assistants</div>	generate a method	unit tests	convert to terraform
Amazon Q Developer	7 / 11	8 / 16	11 / 11
DeepSeek R1 7b 🏠	9 / 11	0 / 16	0 / 11
GPT-4o	7 / 11	8 / 16	10 / 11
Gemini 2.0 Flash	10 / 11	12 / 16	9 / 11
o3-mini	8 / 11	5 / 16	10 / 11
Claude 3.7 Sonnet	7 / 11	10 / 16	11 / 11
Qwen 2.5 7b 🏠	8 / 11	2 / 16	6 / 11

Results

GitHub Copilot, [Continue.dev](#)

Assistants \ Evaluation	generate a method	unit tests	convert to terraform
Amazon Q Developer	<div>Convert into Terraform files</div> <ul style="list-style-type: none">• 1 point, for each resource used of 7 resources and if it has been reported correctly• 1 point, for a right structure• 1 point, for using 4 files• 1 point, if <code>terraform init</code> works• 1 point, if <code>terraform plan</code> works		11 / 11
DeepSeek R1 7b 🏠			0 / 11
GPT-4o			10 / 11
Gemini 2.0 Flash			9 / 11
o3-mini	8 / 11	5 / 16	10 / 11
Claude 3.7 Sonnet	7 / 11	10 / 16	11 / 11
Qwen 2.5 7b 🏠	8 / 11	2 / 16	6 / 11

Results

GitHub Copilot, [Continue.dev](#)

<div><div></div><div></div></div> <div>Evaluation Assistants</div>	generate a method	unit tests	convert to terraform	split templates
Amazon Q Developer	7 / 11	8 / 16	11 / 11	19 / 40
DeepSeek R1 7b 🏠	9 / 11	0 / 16	0 / 11	0 / 40
GPT-4o	7 / 11	8 / 16	10 / 11	16 / 40
Gemini 2.0 Flash	10 / 11	12 / 16	9 / 11	23 / 40
o3-mini	8 / 11	5 / 16	10 / 11	15 / 40
Claude 3.7 Sonnet	7 / 11	10 / 16	11 / 11	28 / 40
Qwen 2.5 7b 🏠	8 / 11	2 / 16	6 / 11	4 / 40

Results

GitHub Copilot, [Continue.dev](https://continue.dev)

Evaluation Assistants	generate a method	unit tests	convert to terraform	split templates
Amazon Q Developer	7 / 11	8 / 16	11 / 11	19 / 40
DeepSeek R1 7b 🏠				0 / 40
GPT-4o				16 / 40
Gemini 2.0 Flash				23 / 40
o3-mini				15 / 40
Claude 3.7 Sonnet	7 / 11	10 / 16	11 / 11	28 / 40
Qwen 2.5 7b 🏠	8 / 11	2 / 16	6 / 11	4 / 40

Split file

- 1 point, for each resource used of 37 resources and if it has been reported correctly
- 1 point, for a right structure
- 1 point, for main.yaml with AWS:Serverless:Application resources
- 1 point, if `sam build -t main.yaml` works

Results

GitHub Copilot, [Continue.dev](#)

<div><div></div><div></div></div> <div>Evaluation Assistants</div>	generate a method	unit tests	convert to terraform	split templates
Amazon Q Developer	7 / 11	8 / 16	11 / 11	19 / 40
DeepSeek R1 7b 🏠	9 / 11	0 / 16	0 / 11	0 / 40
GPT-4o	7 / 11	8 / 16	10 / 11	16 / 40
Gemini 2.0 Flash	10 / 11	12 / 16	9 / 11	23 / 40
o3-mini	8 / 11	5 / 16	10 / 11	15 / 40
Claude 3.7 Sonnet	7 / 11	10 / 16	11 / 11	28 / 40
Qwen 2.5 7b 🏠	8 / 11	2 / 16	6 / 11	4 / 40
Claude 3.7 Sonnet 🏠	8 / 11	5 / 16	8 / 11	14 / 40

Take away

Tools Comparison

Extensions Themes	<u>Tabnine</u>	<u>CodeGPT</u> (+ ollama)	<u>Continue</u> (+ ollama)	<u>Amazon Q Developer</u>	<u>GitHub Copilot</u>
Free	30 day trial	3th party API	3th party API	50 requests / mo	50 requests / mo
Pricing	€9 / user / mo	€9.99 / user / mo	€10 / user / mo	\$19 / user / mo	€22 / user / mo
Commands	/code-explore /document-code /explain-code /fix-code /generate-test-for-code	/Document /Code Builder /Code Interpreter /Comment /Explain /Fix /Inline code /Planning /Refactor /StackOverflow /Unit Test	/Write Cargo test 1 Custom AI Agent	/dev across files /doc /review /test for a file /transform	/explain /fix /fixTestFailure /new /newNotebook /search /setupTests /startDebugging /tests

Tools Comparison & Lowest GPU instances

<https://salad.com/> 1 GPU RTX3090 (24GB): \$16 / 160h

Extensions Themes	<u>Tabnine</u>	<u>CodeGPT</u> (+ ollama)	<u>Continue</u> (+ ollama)	<u>Amazon Q Developer</u>	<u>GitHub Copilot</u>
Free	30 day trial	3th party API	3th party API	50 requests / mo	50 requests / mo
Pricing	€9 / user / mo	€9.99 / user / mo	€10 / user / mo	\$19 / user / mo	€22 / user / mo
Commands	/code-explore /document-code /explain-code /fix-code /generate-test-for-code	/Document /Code Builder /Code Interpreter /Comment /Explain /Fix /Inline code /Planning /Refactor /StackOverflow /Unit Test	/Write Cargo test 1 Custom AI Agent	/dev across files /doc /review /test for a file /transform	/explain /fix /fixTestFailure /new /newNotebook /search /setupTests /startDebugging /tests

Take away

- free ? yes, it is possible
 - more context
 - more instructions
- keep more control
 - more awareness
 - more flexibility
- you can also use free tier / day
 - to try new models
 - to evaluate new agents
- you can choose
 - how many effort
 - how many resources

Insights

- AI Toolkit for VS Code
 - <https://marketplace.visualstudio.com/items?itemName=ms-windows-ai-studio.windows-ai-studio>
 - <https://code.visualstudio.com/docs/intelligentapps/overview>
- CodeGPT
 - <https://marketplace.visualstudio.com/items?itemName=DanielSanMediun.dscodegpt>
 - <https://docs.codegpt.co/docs/category/-ai-providers>
- Continue.dev
 - <https://marketplace.visualstudio.com/items?itemName=Continue.continue>
 - <https://docs.continue.dev/customize/model-providers/gemini>
 - <https://docs.continue.dev/customize/tutorials/custom-code-rag>



Questions ?

@AWSUserGroupVenezia #7 #Meetup #AWS



Bedrock & Roll: Building mess-erprise AI Systems

Marco Gaion - CAIO @ Walit

@AWSUserGroupVenezia #7 #Meetup #AWS



Questions ?

@AWSUserGroupVenezia #7 #Meetup #AWS

Prossimi incontri

- mercoledì 26 marzo, CloudConf, Torino

Prossimi incontri

- mercoledì 26 marzo, CloudConf, Torino
- mercoledì 2 aprile, AWS Community Day, Milano

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- martedì 20 maggio, AWS User Group Venezia, Mogliano
- mercoledì 18 giugno, AWS Summit, Milano

Prossimi incontri

- mercoledì 26 marzo, CloudConf, Torino
- mercoledì 2 aprile, AWS Community Day, Milano
- martedì 20 maggio, AWS User Group Venezia, Mogliano
- mercoledì 18 giugno, AWS Summit, Milano
- giovedì 25 settembre, AWS User Group Venezia, Mestre

Proposte





Spritz



Thanks for participating.

@AWSUserGroupVenezia #7 #Meetup #AWS