

# **GENERATIVE AI ALONE WON'T MAKE YOU A SOFTWARE ENGINEER**

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**JENNA PEDERSON**

**@JENNAPEDERSON**

# WE'LL COVER

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**The good, the bad, and the hard (parts of being a software engineer)**

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**The craft of the software engineer reimaged**

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**Generative AI as a tool in your toolbox**

# **WHAT ARE YOUR FAVORITE AND LEAST FAVORITE PARTS OF BEING A SOFTWARE ENGINEER?**

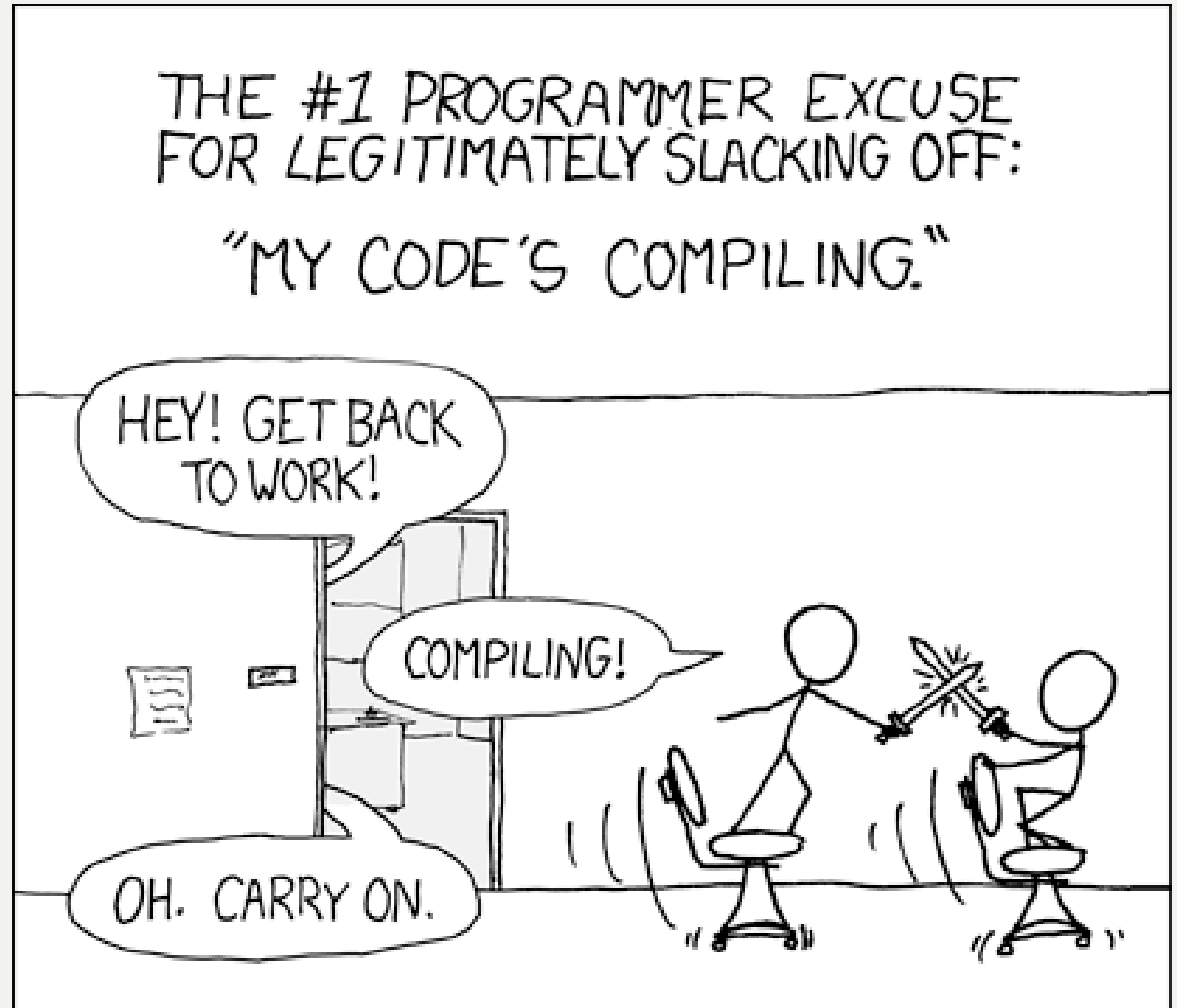
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## 52 MINUTES

The median time that developers spend writing or editing code in their IDE



**COLLABORATING**

**DESIGNING**

**LEARNING**

**PROBLEM SOLVING**

# **SO WHAT ARE WE ACTUALLY DOING?**

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**DOCUMENTING**

**CODING**

**MAINTAINING**

**TESTING**

**HUMANS ARE HARD**

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# EMPATHY

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**Allows us to deeply understand our end users and their needs, experiences, and painpoints**



# ETHICAL RESPONSIBILITY

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**We consider broader impact on society and look at the consequences of what we build and how people will use it**

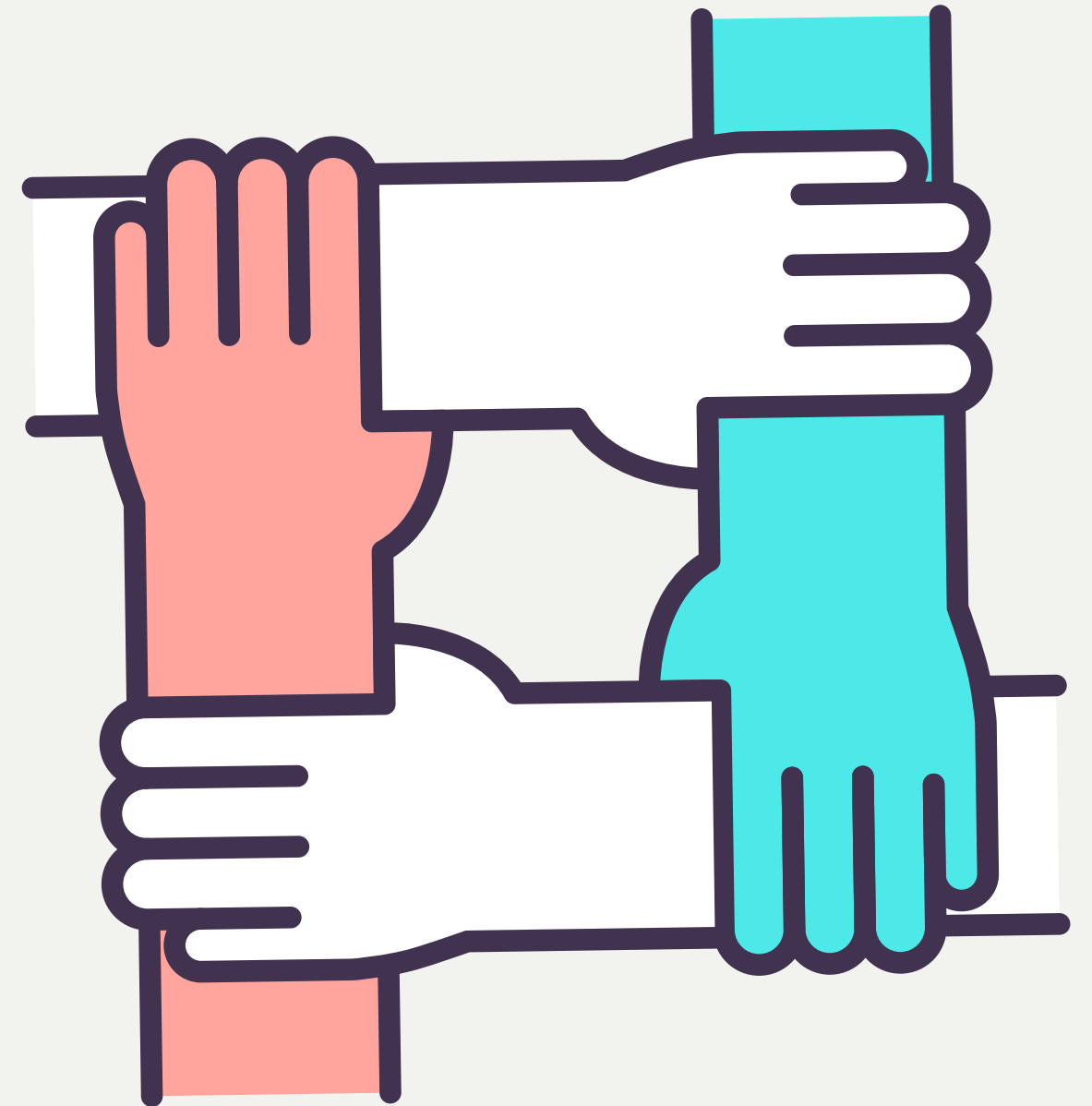




# COLLABORATION

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**We collaborate with our team,  
engineers, stakeholders, end  
users, designers, and more**



# COMMUNICATION

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**We collaborate with our team, engineers, stakeholders, end users, designers, and more**



**Dr Milan Milanović** ✓

@milan\_milanovic



To replace programmers with AI, clients will need to accurately describe what they want.

We're safe.

[#softwareengineering](#) [#programming](#)

1:00 AM · Feb 5, 2023 · **118.6K** Views



44



729



1.2K



70



[https://x.com/milan\\_milanovic/status/1622127889108926466](https://x.com/milan_milanovic/status/1622127889108926466)

**CRITICAL THINKING IS HARD**

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# DIVE DEEP

We gather up knowledge about a problem/problem space, then analyze, synthesize, and evaluate the info we've gathered so we can make reasoned judgements and take action.

**5 Whys**

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**7 So Whats**

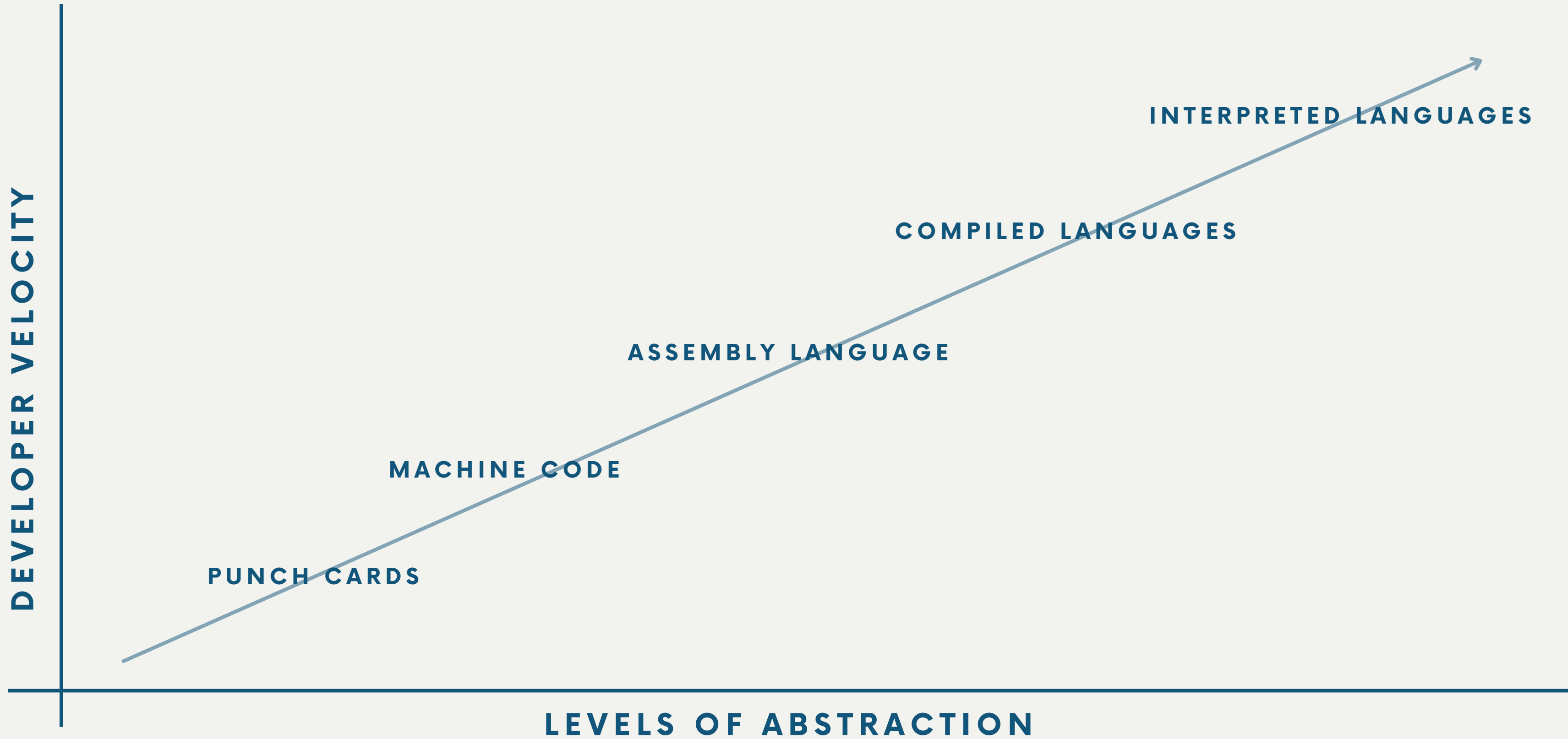
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**First Principles**

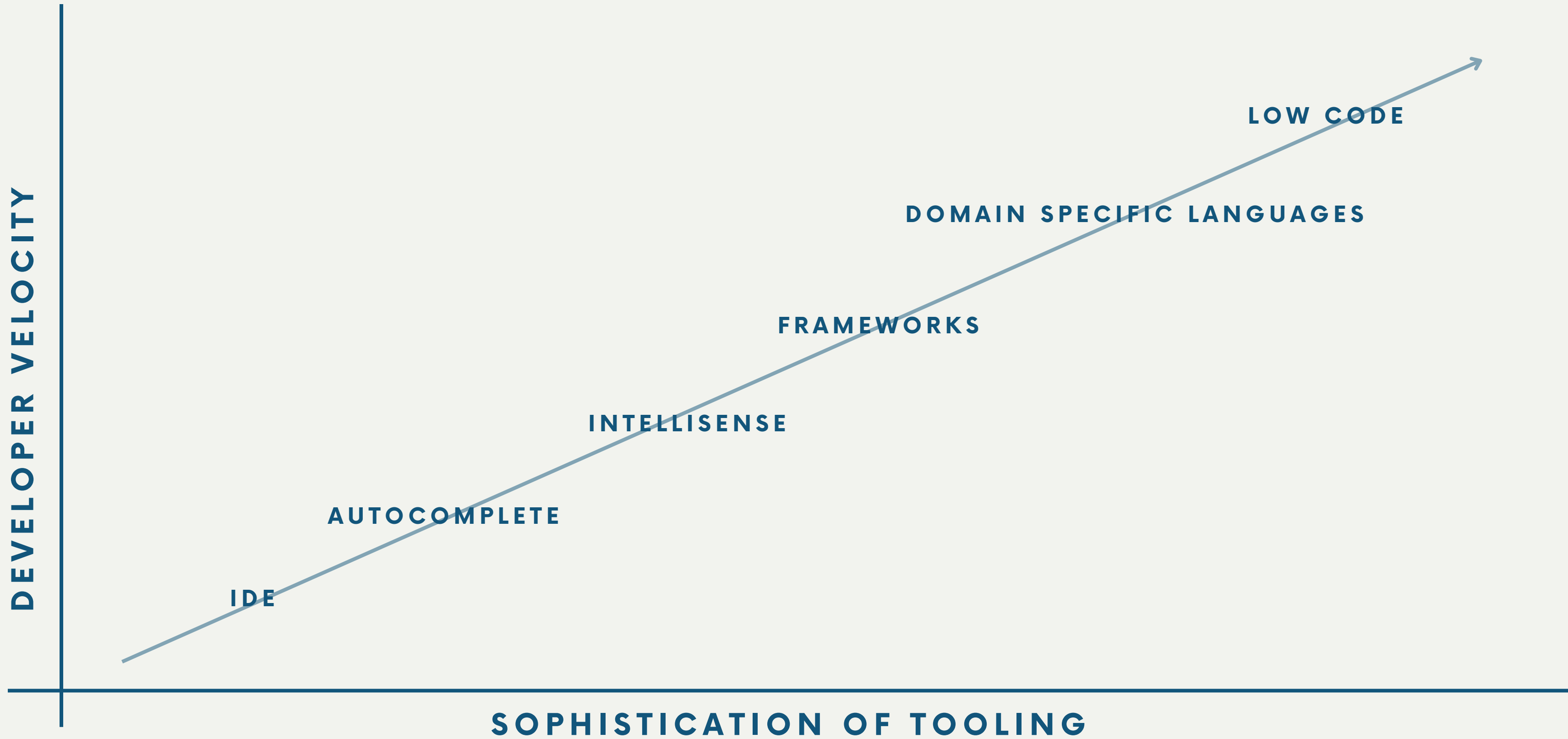
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**Pareto Principle**

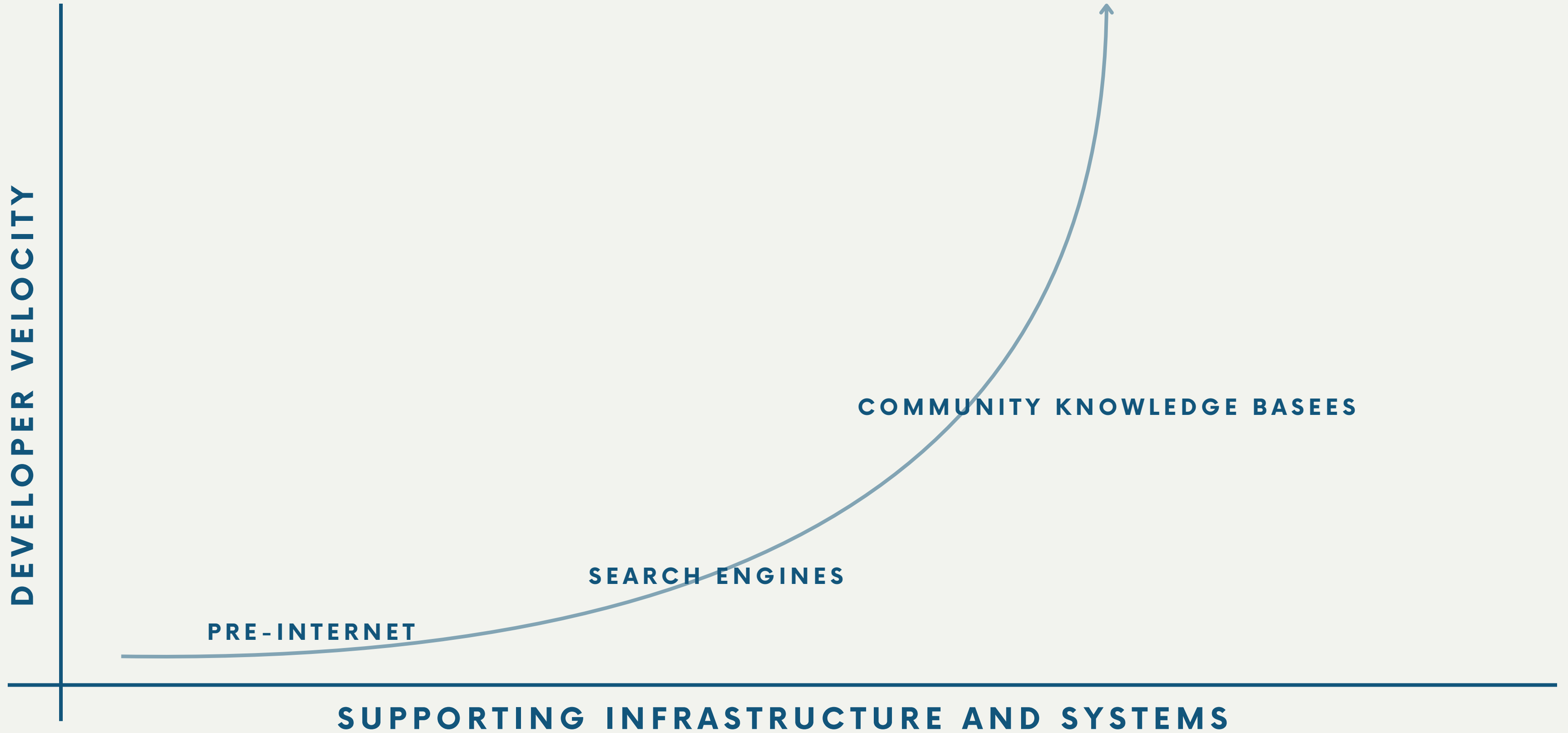
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# **COPY/PASTE DEVELOPER**



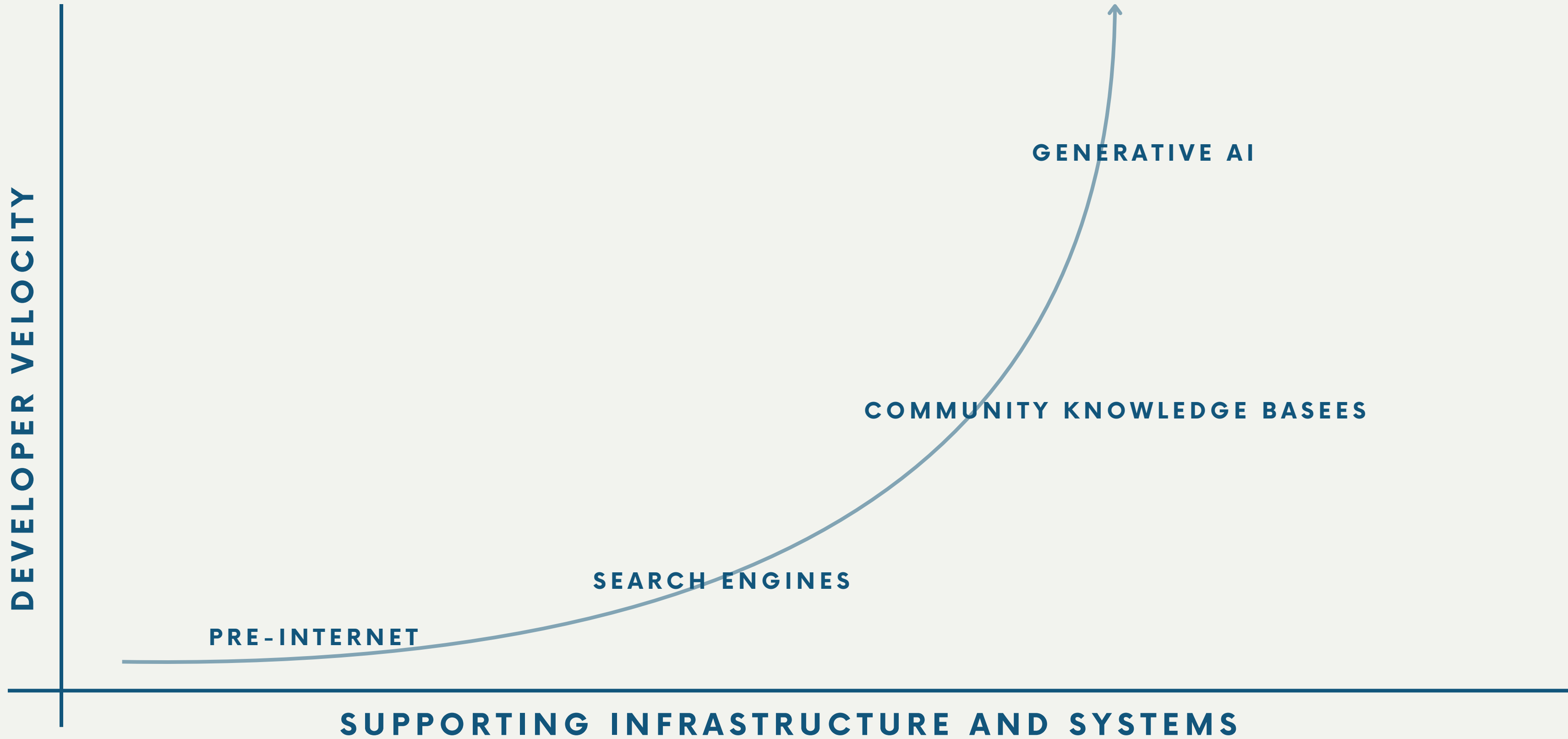
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**CODE IS LANGUAGE**

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# DO YOU USE GENERATIVE AI DEVELOPER TOOLS?

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# REIMAGINING THE CRAFT OF THE SOFTWARE ENGINEER

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**1. It relies on context**

# **OUR EXPECTATIONS OF GENERATIVE AI TOOLS**

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**2. We need to know what it's optimized for**

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**3. We need to know that it hallucinates**

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**4. It can help with the hard parts of software engineering**



# OUR EXPECTATIONS OF GENERATIVE AI TOOLS

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**4. It can help with the hard parts of software engineering**

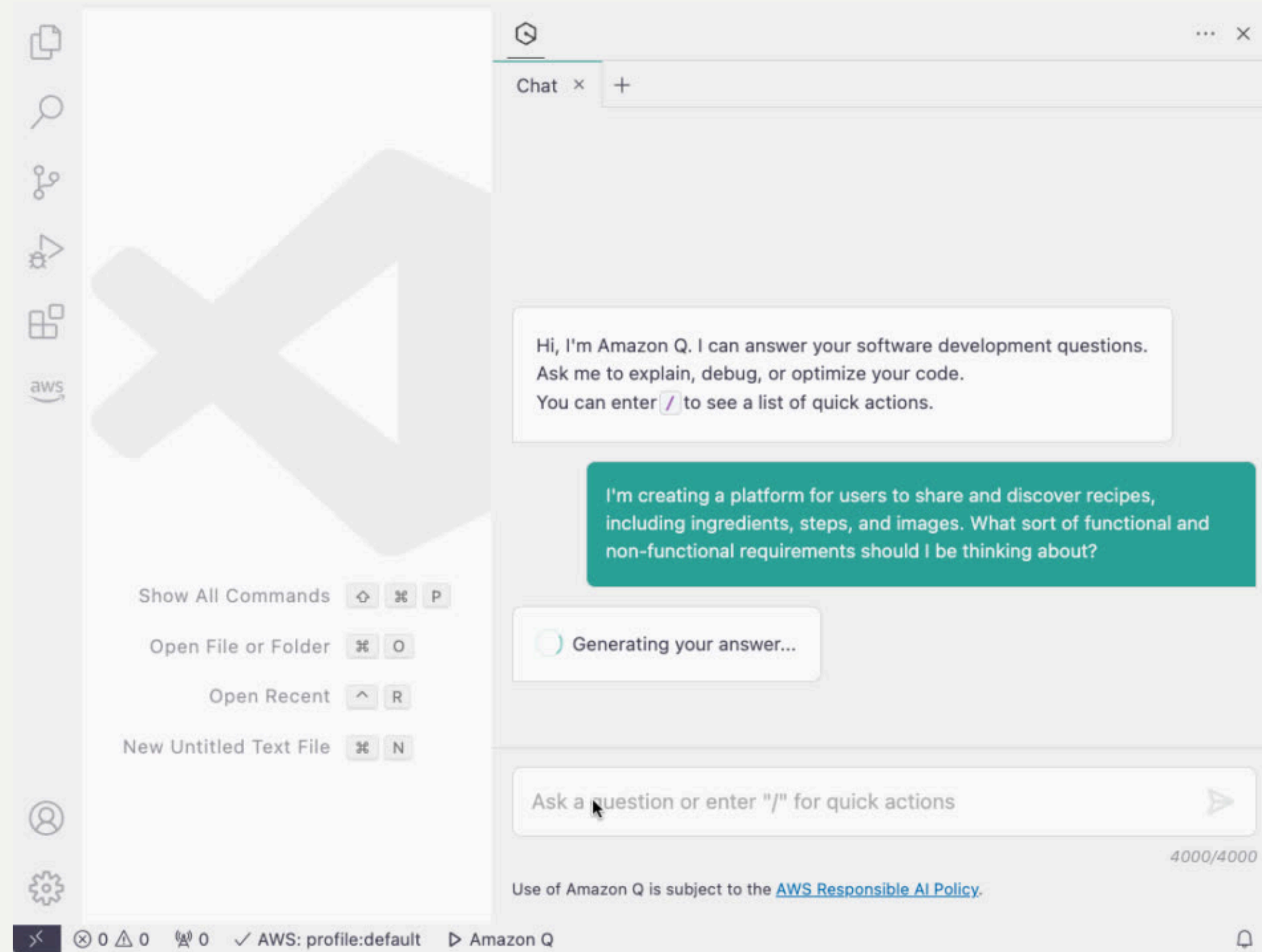
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**5. It can help in every phase of the SDLC**

# ANALYSIS, REQUIREMENTS, & PLANNING

## Prompt:

I'm creating a platform for users to share and discover recipes, including ingredients, steps, and images. What sort of functional and non-functional requirements should I be thinking about?

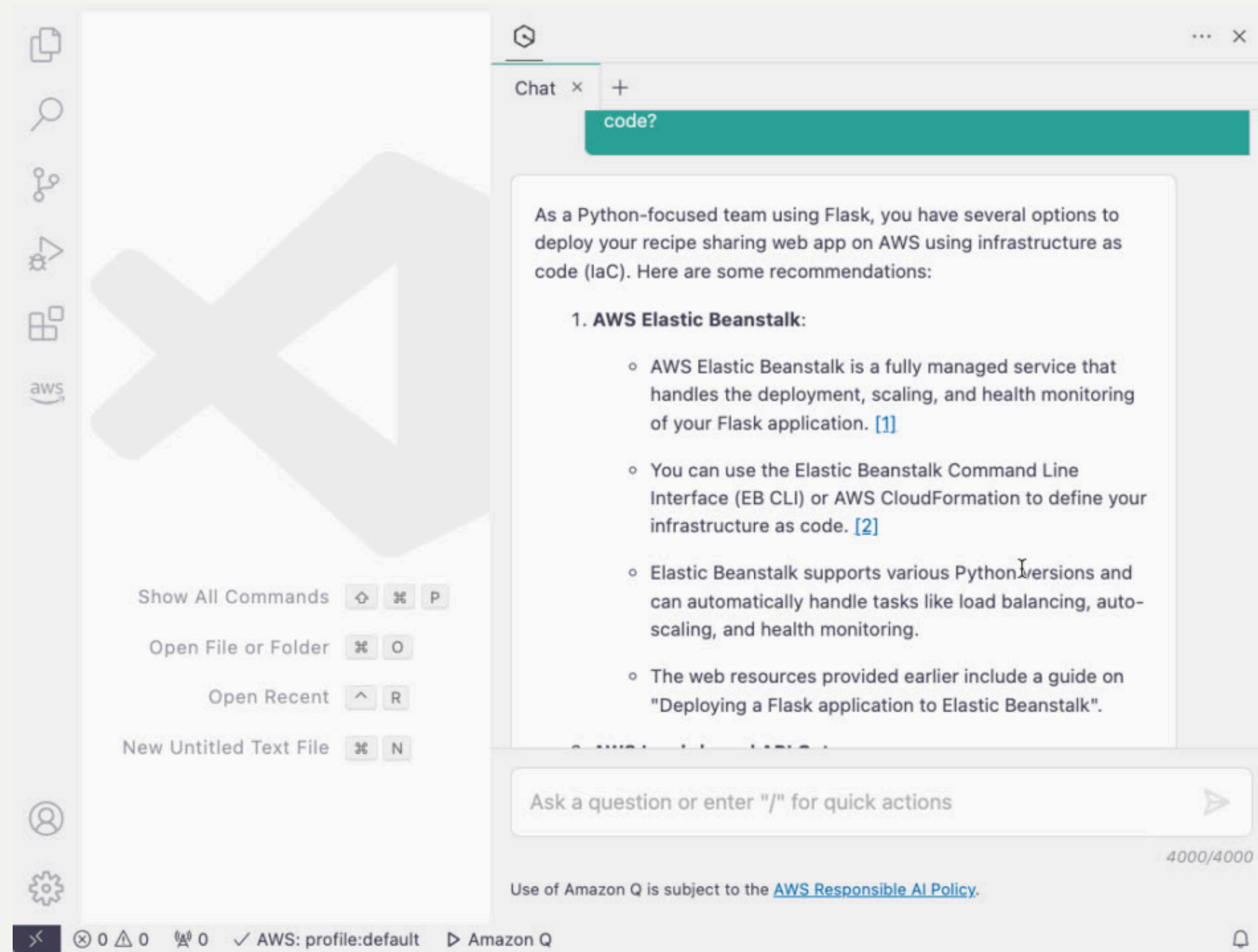


The screenshot displays the Amazon Q chat interface. On the left, a sidebar contains icons for file operations and the AWS logo. The main chat area shows a welcome message from Amazon Q: "Hi, I'm Amazon Q. I can answer your software development questions. Ask me to explain, debug, or optimize your code. You can enter / to see a list of quick actions." Below this, a green prompt box contains the text: "I'm creating a platform for users to share and discover recipes, including ingredients, steps, and images. What sort of functional and non-functional requirements should I be thinking about?". A response box shows "Generating your answer...". At the bottom, there is an input field with the placeholder text "Ask a question or enter '/' for quick actions" and a character count "4000/4000". The footer includes the text "Use of Amazon Q is subject to the [AWS Responsible AI Policy](#)." and a status bar with "AWS: profile:default" and "Amazon Q".

# DESIGN & ARCHITECTURE

## Prompt:

I would like to use AWS to deploy this web app. My team is made up of mostly Python engineers. We'll use Flask to build the app. What options do I have to deploy this app on AWS that include using infrastructure as code?



The screenshot shows the Amazon Q chat interface. On the left, there is a sidebar with icons for file operations, search, and AWS. The main chat area displays a prompt: "code?". The response from Amazon Q is as follows:

As a Python-focused team using Flask, you have several options to deploy your recipe sharing web app on AWS using infrastructure as code (IaC). Here are some recommendations:

- 1. AWS Elastic Beanstalk:**
  - AWS Elastic Beanstalk is a fully managed service that handles the deployment, scaling, and health monitoring of your Flask application. [1]
  - You can use the Elastic Beanstalk Command Line Interface (EB CLI) or AWS CloudFormation to define your infrastructure as code. [2]
  - Elastic Beanstalk supports various Python versions and can automatically handle tasks like load balancing, auto-scaling, and health monitoring.
  - The web resources provided earlier include a guide on "Deploying a Flask application to Elastic Beanstalk".

At the bottom of the chat window, there is a text input field with the placeholder "Ask a question or enter '/' for quick actions" and a character count "4000/4000". Below the input field, a disclaimer states: "Use of Amazon Q is subject to the [AWS Responsible AI Policy](#)."

The bottom status bar shows system icons, a checkmark, "AWS: profile:default", and "Amazon Q".

# DEVELOPMENT

**Prompt:**

What are the steps to bootstrap a simple Flask app that has one route "/recipes" that outputs "My Recipes" text? I need to set up a python virtual environment and requirements.txt as part of this.

The screenshot shows a development environment with a chat interface. The chat window has a title bar with 'Chat' and a close button. The prompt is: "What are the steps to bootstrap a simple Flask app that has one route "/recipes" that outputs "My Recipes" text? I need to set up a python virtual environment and requirements.txt as part of this." The response is: "Certainly, I'd be happy to help you with that. Here are the steps" followed by a list starting with "1.". The IDE background shows a terminal with a command prompt and a list of shortcuts: "Show All Commands", "Open File or Folder", "Open Recent", and "New Untitled Text File". The bottom status bar shows "AWS: profile:default" and "Amazon Q".

Chat × +

What are the steps to bootstrap a simple Flask app that has one route "/recipes" that outputs "My Recipes" text? I need to set up a python virtual environment and requirements.txt as part of this.

Certainly, I'd be happy to help you with that. Here are the steps

1.

Ask a question or enter "/" for quick actions

4000/4000

Use of Amazon Q is subject to the [AWS Responsible AI Policy](#).

× 0 △ 0 ☹ 0 ✓ AWS: profile:default ▶ Amazon Q

# DEBUGGING

## Prompt:

When I run "python app.py" my Flask app does not start. There is no output when the command completes. Where should I investigate?

The screenshot shows an IDE interface with a code editor and a chat window. The code editor displays the following Python code in `app.py`:

```
1 from flask import Flask
2
3 app = Flask(__name__)
4
5 @app.route('/recipes')
6 def recipes():
7     return "My Recipes"
8
```

The chat window contains the following prompt:

When I run "python app.py" my Flask app does not start. There is no output when the command completes. Where should I investigate?

The terminal window shows the command `python app.py` being executed in a shell environment with the prompt `(.venv) ~/Development/demo/recipe-demo`.

At the bottom of the IDE, the status bar indicates the current file is `Ln 8, Col 1`, the encoding is `UTF-8`, the line ending is `LF`, and the language is `Python`. The status bar also shows `3870/4000` characters and a note: "Use of Amazon Q is subject to the [AWS Responsible AI Policy](#)."



# TESTING

## Prompt:

I want to create a unit test for the "/recipes" route. What are the steps and example code to do that?

The screenshot shows an IDE window with a Python file named `app.py` containing the following code:

```
1 from flask import Flask
2
3 app = Flask(__name__)
4
5 @app.route('/recipes')
6 def recipes():
7     return "My Recipes"
8
```

Below the code is a terminal window showing the command `python -m flask run` being executed. The output includes a warning about using a development server and the URL `http://127.0.0.1:5000`.

On the right side, there is a chat interface with a prompt: "I want to create a unit test for the '/recipes' route. What are the steps and example code to do that?". The response from the chat is:

Okay, let's go through the steps to create a unit test for the "/recipes" route in your Flask app. [1]

**1. Set up the test environment:**

- Import the necessary modules, including `unittest` and your Flask app. [2]
- Create a test case class that inh

At the bottom of the chat interface, there is a text input field with the placeholder "Ask a question or enter '/' for quick ac..." and a character count "4000/4000". Below the chat interface, there is a footer that reads "Use of Amazon Q is subject to the [AWS Responsible AI Policy](#)." and a status bar showing "Ln 8, Col 1 Spaces: 2 UTF-8 LF Python".

# DEPLOYMENT

## Prompt:

What are the steps to deploy this Flask app as a container to ECS using Fargate?

The image shows a development environment with three main components:

- Code Editor:** Displays `app_test.py` with the following Python code:

```
1  unittest
2  pp import app
3
4  TestRecipesRoute(unittest.TestCase):
5  f setUp(self):
6      self.app = app.test_client()
7      self.app.testing = True
8
9  f test_recipes_route(self):
10     response = self.app.get('/recipes')
11     self.assertEqual(response.status_code, 200)
12     self.assertIn('Open Source North', response.get_data(as_text=True))
13
14  if __name__ == '__main__':
15     unittest.main()
16
```
- Terminal:** Shows the execution of the test, which failed:

```
, line 12, in test_recipes_route
    self.assertIn('Open Source North', response.get_data(as_text=True))
AssertionError: 'Open Source North' not found in 'My Recipes'
```

Ran 1 test in 0.004s

FAILED (failures=1)

(.venv) `~/Development/demo/recipe-demo`
- Chat Interface:** Contains a question and an answer:

**Question:** [1] How can I unit test this Flask app?  
[stackoverflow.com > questions > 13959209](https://stackoverflow.com/questions/13959209)  
Show more

**Answer:** What are the steps to deploy this Flask app as a container to ECS using Fargate?

Okay, let's go through the steps to deploy your Flask app as a container to Amazon Elastic Container Service (ECS) using AWS Fargate: [1]

**1. Containerize the Flask app:**

  - Create a `Dockerfile` in your project directory that defines how to build the container image for your Flask app.

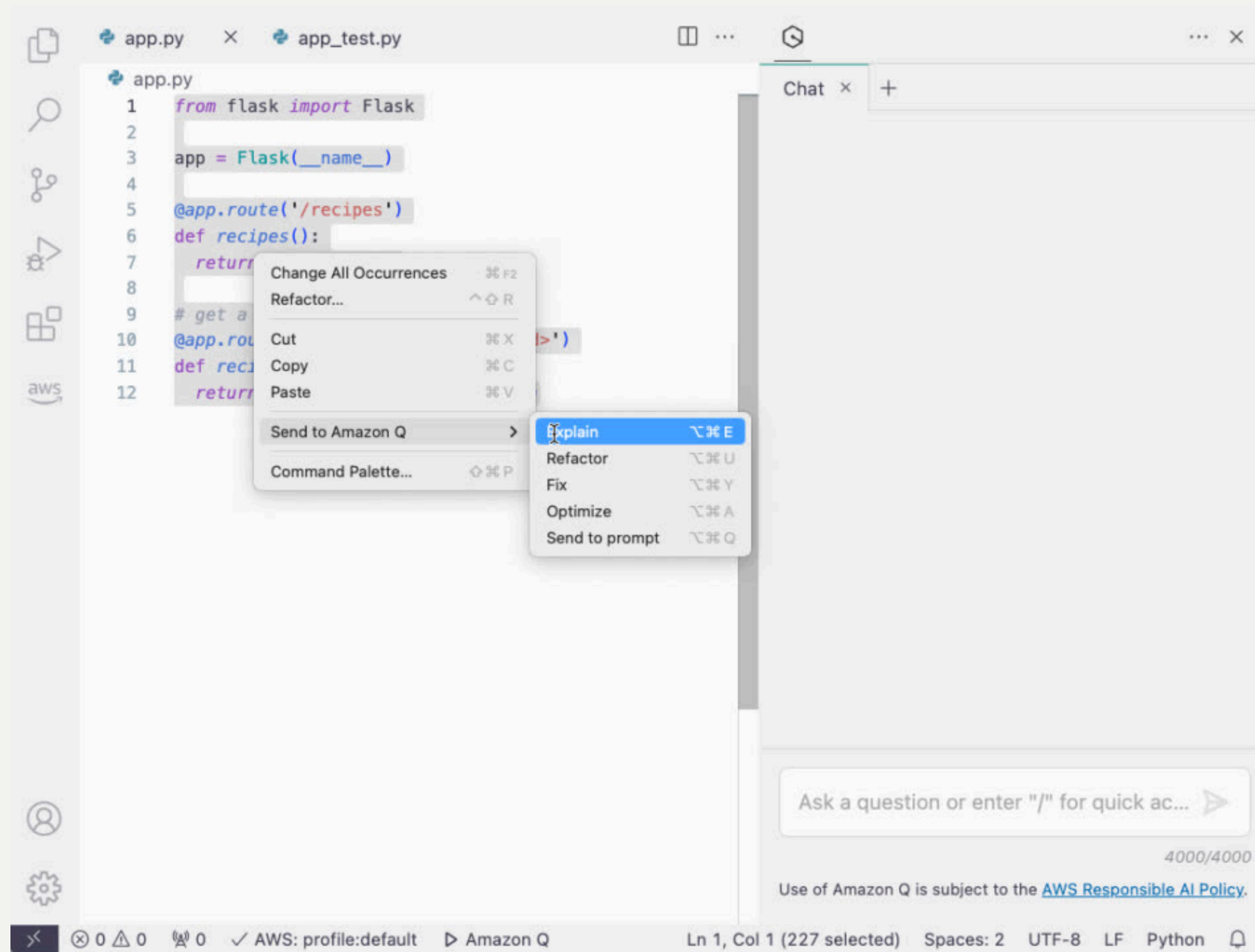
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Ln 12, Col 41 Spaces: 2 UTF-8 LF Python

# MAINTENANCE

## Send to Amazon Q

Explain the following part of my code





# WHAT USE CASES ARE MOST USEFUL TO YOU WHEN USING GENERATIVE AI TOOLS?

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# OUR EXPECTATIONS OF GENERATIVE AI TOOLS

---

**1. It relies on context**

---

**2. We need to know what it's optimized for**

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**3. We need to know that it hallucinates**

---

**4. It can help with the hard parts of software engineering**

---

**5. It helps in every phase of the SDLC**

---

**6. The tech is rapidly changing**

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**GENERATIVE AI  
IS A TOOL  
IN YOUR TOOLBOX**

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# CRAFTING PROMPTS

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# BE SPECIFIC AND CLEAR

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**1. Clarity**

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**2. Intent**

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**3. Context**

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**4. Constraints**

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# USE EXAMPLES

I would like to add a new query and lambda function handler to make a call to Amazon Bedrock to generate an image based on a text prompt. This call will be patterned after the existing `generateChatResponse.ts` and instead of using the Anthropic model, it will use `amazon.titan-image-generator-v1` model.

The response should return a base 64 string that can be displayed as an image in `App.tsx`.

# USE AN ITERATIVE APPROACH

What are the steps to store my Recipes in a database?

What are the steps to store my Recipes in an RDS database? I am starting from scratch, with a new AWS account.

Certainly, I'd be happy to provide the steps to store your recipes in an Amazon RDS database, starting from a new AWS account.

To get started, you'll need to follow these steps:

1. **Set up your AWS account:** If you're starting with a new AWS account, you'll first need to sign up and create an account. This involves providing your contact information and payment details. [\[1\]](#)
2. **Create an IAM user:** Within your AWS account, you'll need to create an IAM (Identity and Access Management) user with the necessary permissions to access and manage your RDS database. This user will have programmatic access to your AWS resources. [\[2\]](#)
3. **Create a VPC and subnets:** Amazon RDS databases run within a Virtual Private Cloud (VPC). You'll need to create a VPC and at least two private subnets within it. This will provide a secure, isolated network environment for your database.
4. **Create a security group:** A security group acts as a virtual firewall, controlling inbound and outbound traffic to your RDS database. You'll need to create a security group and configure the necessary rules to allow access to your database.
5. **Create an RDS database:** In the AWS Management Console, navigate to the RDS service and create a new database instance. You'll need to choose the database

# BREAK DOWN COMPLEX QUERIES

Amazon Q



What are the steps I need to take to create a VPC for an RDS database?

To create a VPC for an RDS database, you can follow these steps:

1. Identify the private subnets for your database in the VPC:
  - Open the Amazon VPC console and navigate to the Subnets page.
  - Note the subnet IDs of the private subnets you want to use for your RDS database.
2. Create a DB subnet group:
  - Open the Amazon RDS console and navigate to the Subnet Groups page.
  - Click "Create DB subnet group" and provide a name and description for the subnet group.
  - Select the VPC you want to use and the private subnets you identified in the previous step.
  - Click "Create" to create the DB subnet group.
3. Create the RDS database instance:
  - In the Amazon RDS console, choose "Launch DB Instance" to create a new database.






# UNDERSTAND THE NON-DETERMINISTIC NATURE

Suggestions are guidance rather than definitive answers

# UNDERSTAND THE NON-DETERMINISTIC NATURE

 Suggestions are guidance rather than definitive answers

**COMPUTERS DON'T GO TO JAIL.  
PEOPLE DO.**

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# RECALIBRATING THE CRAFT OF THE SOFTWARE ENGINEER

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# **A NEW TOOL IN YOUR TOOLBOX**

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# **WITH EMPHASIS ON CRITICAL THINKING**

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**Kent Beck** 🌻 🟦

@KentBeck



I've been reluctant to try ChatGPT. Today I got over that reluctance. Now I understand why I was reluctant.

The value of 90% of my skills just dropped to \$0. The leverage for the remaining 10% went up 1000x. I need to recalibrate.

2:51 PM · Apr 18, 2023 · **1.4M** Views

<https://x.com/KentBeck/status/1648413998025707520>

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Stuff that generative AI  
developer tools can do  
better than me

Things that generative  
AI developer tools will  
help me do better

Things that developers  
will always do best




# THANK YOU!

Please share your feedback!

 /in/jennapederson

 @jennanerdsout

 @jennapederson