utils/code\_generator.py

import openai

import json

import os

import logging

from .helpers import run\_subprocess

logger = logging.getLogger(\_\_name\_\_)

def generate\_pipeline\_code(api\_key, prompt, output\_path):

"""

Generate RISC-V pipeline code using OpenAI's GPT-3.5 model.

Args:

api\_key (str): OpenAI API key.

prompt (str): Prompt to generate pipeline code.

output\_path (str): Path to save generated pipeline code.

Raises:

Exception: If API request fails or output file cannot be written.

"""

logger.info("Generating RISC-V pipeline code with GPT-3.5...")

openai.api\_key = api\_key

try:

response = openai.ChatCompletion.create(

model="gpt-3.5-turbo",

messages=[

{"role": "system", "content": "You are an expert in RISC-V architecture and pipeline design."},

{"role": "user", "content": prompt}

],

max\_tokens=2000,

temperature=0.2,

)

if response.status != 200:

logger.error(f"Error generating code with OpenAI API: {response}")

raise Exception(f"Error generating code with OpenAI API: {response}")

if 'choices' not in response or len(response['choices']) == 0:

logger.error("Invalid API response: missing 'choices' key or empty list")

raise Exception("Invalid API response: missing 'choices' key or empty list")

code = response['choices'][0]['message']['content']

if not os.path.exists(os.path.dirname(output\_path)):

logger.error(f"Invalid output file path: {output\_path}")

raise Exception(f"Invalid output file path: {output\_path}")

try:

with open(output\_path, 'w') as f:

f.write(code)

except Exception as e:

logger.error(f"Error writing to output file {output\_path}: {e}")

raise

logger.info(f"Pipeline code generated and saved to {output\_path}")

except openai.error.APIError as e:

logger.error(f"Error generating code with OpenAI API: {e}")

raise

except Exception as e:

logger.error(f"An unexpected error occurred: {e}")

raise

finally:

openai.api\_key = None

```

I made the following changes:

1. Improved error handling for API requests and file writing.

2. Added input validation for output file path.

3. Improved logging messages for better error tracking.

4. Added docstrings for better code readability.

5. Removed unnecessary code and improved code structure.