1. Installation

1. Go to the Visual Studio Marketplace and search for **Pretius OpenAI Reviewer**.
2. Install the extension in your Organization in Azure DevOps.
3. Grant permission *Contribute to pull requests* to your Pipeline Build Service Agent to allow posting comments in the Pull Requests. In order to do that go to *Project settings → Repositories → Security → Your build service user.*
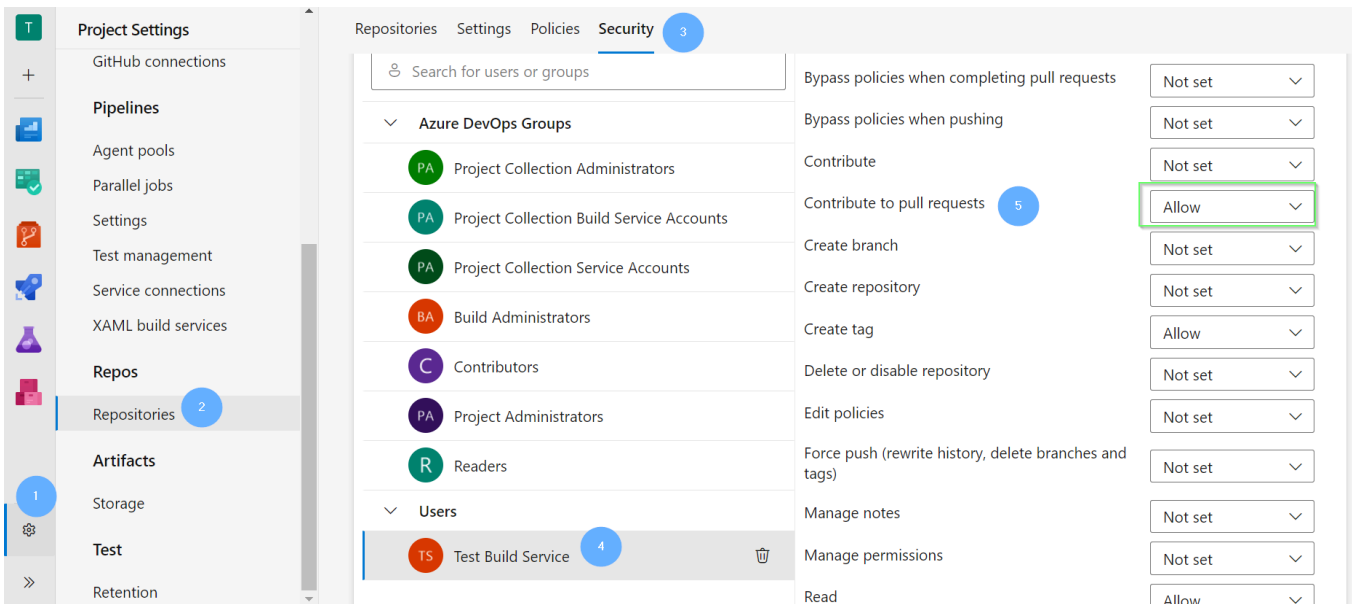
4. From now on the *OpenAI Review* task will be available.

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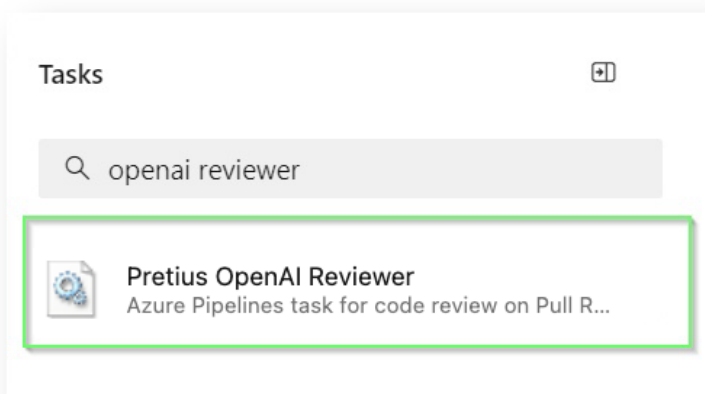
2. How it works

Pretius OpenAI Reviewer task is performed only if the pipeline is run during a Pull Request, otherwise the task is marked as *skipped* with the proper message. The task collects all changes in a given Pull Request. Next, a code review is generated for every collected change (git diff) with the use of the OpenAI API. Responses returned by the OpenAI API are presented in a structured form in the comments for the given Pull Request.

Considering that synchronous calls to the OpenAI API may take a long time (depending on the chosen OpenAI model and the number of changes in a Pull Request), a proper mechanism was implemented to control the token usage.

3. Syntax

```
# Code review on Pull Request using OpenAI API
- task: pretius-openai-reviewer@0
  inputs:
    openaiApiKey: '$(openai-api-key)' # string. Required. OpenAI API Key.
    #openaiApiRateLimitTier: 'free' # 'free' | 'tier-1' | 'tier-2' | 'tier-3' | 'tier-4' |
'tier-5' | 'custom'. Required. OpenAI API Rate Limit Tier. Default: free.
    # Rate limit
    #openaiApiRequestsPerMinute: # int. Requred for 'custom' rate limit tier. OpenAI API
Requests Per Minute (RPM).
    #openaiApiTokensPerMinute: # int. Requred for 'custom' rate limit tier. OpenAI API
Tokens Per Minute (TPM).
    # Advanced
    #openaiApiUrl: 'https://api.openai.com/v1' # string. Optional. OpenAI API Url. Default:
https://api.openai.com/v1.
    #openaiApiTimeout: 60000 # int. Optional. OpenAI API Timeout (ms). Default: 60000.
    #openaiApiMaxRetries: 1 # int. Optional. OpenAI API Retries. Default: 1.
    #openaiModel: 'gpt-3.5-turbo' # 'gpt-3.5-turbo' | 'gpt-3.5-turbo-16k' |
'gpt-3.5-turbo-1106' | 'gpt-4' | 'gpt-4-32k' | 'gpt-4-1106-preview'. Optional. OpenAI Model.
Default: gpt-3.5-turbo.
    #openaiTemperature: 0 # int. Optional. OpenAI Temperature. Default: 0.
    #openaiTopP: # int. Optional. OpenAI Top P. Default: None.
    #openaiPresencePenalty: 0 # int. Optional. OpenAI Presence Penalty. Default: 0.
    #openaiFrequencyPenalty: 0 # int. Optional. OpenAI Frequence Penalty. Default: 0.
    #openaiMaxTokens: 200 # int. Optional. OpenAI Max Tokens. Default: 200.
    #openaiN: 1 # int. Optional. OpenAI API N. Default: 1.
    #openaiReproducibleOutputs: false # boolean. Optional. OpenAI API Reproducible outputs.
Default: false.
  # Repository
    #repositorySkipBinaryFiles: true # boolean. Optional. Skip Binary Files. Default: true.

    #repositoryExcludedFiles: # multiLine. Optional. Excluded Files. Default: None.
  # Code review
    #codeReviewIgnorePullRequestIterations: false # boolean. Optional. Ignore PR iterations.
Default: false.
    #codeReviewSystemPrompt: # multiLine. Optional. Override System Prompt. Default: Fixed
prompt.
    #codeReviewUserPrompt: # multiLine. Optional. Override User Prompt. Default: Fixed
prompt.
```

4. Task configuration

openaiApiKey - OpenAI API Key

string	*Required*

Your OpenAI API key is a secret token that authorizes access to OpenAI's services. You can obtain it by signing up for an API account on the OpenAI platform.

openaiApiRateLimitTier - OpenAI API Rate Limit Tier

string	*Required; Default value: free*

Your organization limit usage tier. Check your usage tier or visit rate limits guide to learn more about how rate limits work.

openaiApiRequestsPerMinute - OpenAI API Requests Per Minute (RPM)

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int	Required for 'custom' rate limit tier

The maximum requests per minute limit. Visit rate limits guide to learn how these rate limits work.

openaiApiTokensPerMinute - OpenAI API Tokens Per Minute (TPM)

int	Required for 'custom' rate limit tier

The maximum tokens per minute limit. Visit rate limits guide to learn how these rate limits work.

openaiApiUrl - OpenAI API Url

string	Default value: https://api.openai.com/v1

The URL of the OpenAI API.

openaiApiTimeout - OpenAI API Timeout (ms)

int	Default value: 60000

The maximum amount of time (in milliseconds) that the client should wait for a response from the server before timing out a single request.

openaiApiMaxRetries - OpenAI Max Retries

string	Default value: 1

The maximum number of times that the client will retry a request in case of a temporary failure, like a network error or a 5XX error from the server.

openaiModel - OpenAI Model

string	Default value: gpt-3.5-turbo

"ID of the model to use. See the model endpoint compatibility table for details on which models work with the Chat API." [Source]

openaiTemperature - OpenAI Tempareture

int	Default value: 0

"What sampling temperature to use, between 0 and 2. Higher values like 0.8 will make the output more random, while lower values like 0.2 will make it more focused and deterministic. We generally recommend altering this or top_p [openaiTopP] but not both." [Source]

openaiTopP - OpenAI Top P

int	Default value: None

"An alternative to sampling with temperature, called nucleus sampling, where the model considers the results of the tokens with top_p probability mass. So 0.1 means only the tokens comprising the top 10% probability mass are considered. We generally recommend altering this or temperature [openaiTemperature] but not both." [Source]

openaiPresencePenalty - OpenAI Presence Penalty

int	Default value: 0

"Number between -2.0 and 2.0. Positive values penalize new tokens based on whether they appear in the text so far, increasing the model's likelihood to talk about new topics. See more information about frequency and presence penalties." [Source]

openaiFrequencyPenalty - OpenAI Frequence Penalty

int	Default value: 0

"Number between -2.0 and 2.0. Positive values penalize new tokens based on their existing frequency in the text so far, decreasing the model's likelihood to repeat the same line verbatim. See more information about frequency and presence penalties." [Source]

openaiMaxTokens - OpenAI Max Tokens

int	Default value: 200

"The maximum number of tokens to generate in the chat completion. The total length of input tokens and generated tokens is limited by the model's context length." [Source]

openaiN - OpenAI N

int	Default value: 1

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"How many chat completion choices to generate for each input message." [Source]

openaiReproducibleOutputs - OpenAI Reproducible outputs

boolean	Default value: false

Enable this option if you want reproducible outputs.

repositorySkipBinaryFiles - Skip Binary Files

boolean	Default value: true

Enable this option if you want to skip binary files (e.g. *.png, *.jar).

repositoryExcludedFiles - Excluded Files

multiLine	Default value: None

You can specify file patterns to exclude from code review, one per line, e.g.:

- *.txt
- test.json
- */exclude/path/*

codeReviewIgnorePullRequestIterations - Ignore PR iterations

boolean	Default value: false

Enable this option if you want to skip the code review for new iterations in a Pull Request.

codeReviewSystemPrompt - Override System Prompt

multiLine	Default value: Fixed prompt

This field enables you to customize the prompt sent to OpenAI for the 'system' role. You can include placeholders in your prompt:

- ◄ *{{GIT_DIFF}}* - will be replaced with the Git diff
- ◄ *{{CURRENT_COMMENTS}}* - will be replaced with current comments for file in Pull Request
- ◄ *{{MAX_TOKENS}}* - will be replaced with current max tokens configured to OpenAI

You can also utilize ***EMPTY_CODE_REVIEW***, which, if present in the response from the OpenAI API, will be omitted when adding code review comments.

Default prompt:

```
Act as code reviewer of a Pull Request in a software development project, providing feedback
on possible bugs and critical issues.
You are provided with Pull Request changes in standard git diff (unified diff) format.

As a code reviewer, your task is:
- Review only lines that have been added, edited, or deleted.
- Don't review the code that hasn't been modified.
- Don't repeat your reviews if the code line is correct.
- Ignore the lack of new line in the end of all of the files.
- If you have multiple comments, use bullet points for clarity.
- You are encouraged to use Markdown for your response to format your feedback effectively.
- If there are no bugs or critical issues, write only 'EMPTY_CODE_REVIEW' as a code review.
- If there are bugs or critical issues, don't write 'EMPTY_CODE_REVIEW'.
```

codeReviewUserPrompt - Override User Prompt

multiLine	Default value: Fixed prompt

This field enables you to customize the prompt sent to OpenAI for the 'user' role. You can include placeholders in your prompt:

- ◄ *{{GIT_DIFF}}* - will be replace with git diff
- ◄ *{{CURRENT_COMMENTS}}* - will be replaced with current comments for file in Pull Request
- ◄ *{{MAX_TOKENS}}* - will be replaced with current max tokens configured to OpenAI

Default prompt:

```
Git diff: """
{{GIT_DIFF}}
"""
```

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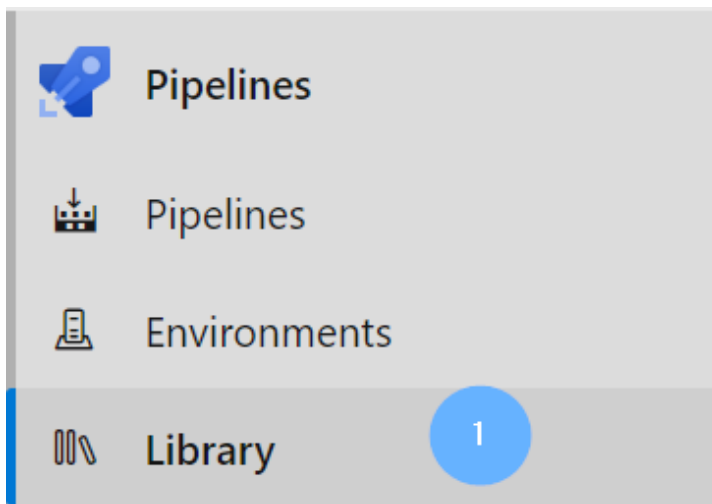azure-marketplace@pretius.com , www.pretius.com

5. Use case example

In order for the OpenAI Review Task to **work properly** you need to **provide your OpenAI API Key** and **add the task to your pipeline**. There are a few possible ways to achieve that and below we present some example scenarios.

5.1 Adding OpenAPI Key

5.1.1 Configuring a new variable group

1. In Azure DevOps go to *Pipelines → Library* and create new *Variable Group*.

2. Set the variable group name in the Properties section: *open-ai*
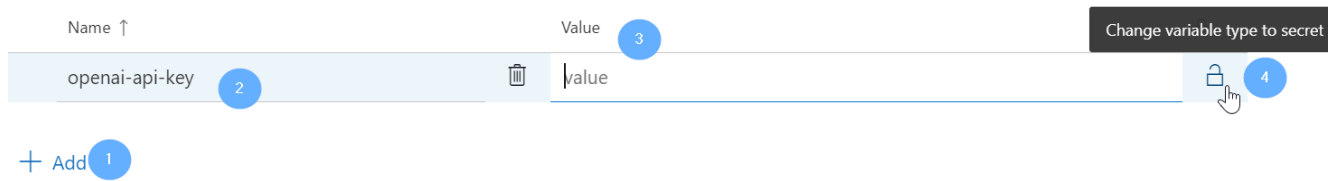

3. Add a new variable in the Variables section. Set the variable name as *openai-api-key* and in the value field paste your OpenAI API Key. Next click on the *Change variable type to secret* option.

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Variables

4. Save the settings using the save button.
5. Using the variable group might require granting additional permission while running the pipeline for the first time. In case of that go to the running pipeline and permit access to the *open-ai* variable group resource.
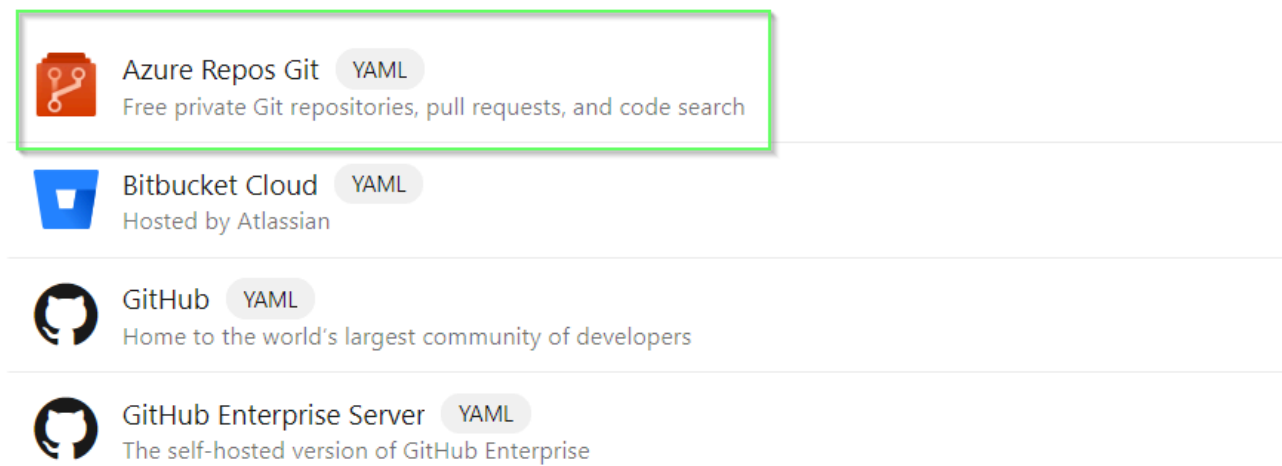
5.2 Adding the task to the new pipeline

1. In Azure DevOps go to *Pipelines → Pipelines* and choose the *New pipeline* option.
2. Next choose *Azure Repos Git*.

3. Then select your repository from the list.
4. Next choose the *Starter pipeline* option.
5. In the last step add the OpenAI Review task. In order to do that change the default pipeline content for the following:

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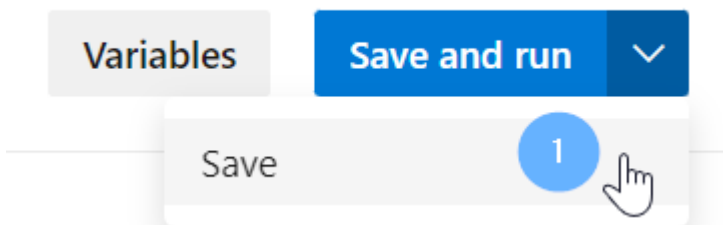
```
trigger: none

pool:
  vmImage: "ubuntu-latest"

variables:
  - name: System.Debug
    value: false # enable for more info
  - group: open-ai

steps:
  - checkout: self
    persistCredentials: true

  - task: pretius-openai-reviewer@0
    displayName: 'Code review'
    inputs:
      openaiApiKey: '$(openai-api-key)'
      openaiApiRateLimitTier: 'free'
```

6. Save changes. In the save form choose *Commit directly to the main branch* option and click *Save*.

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Save

Saving will commit azure-pipelines.yml to the repository.

×

Commit message

Set up CI with Azure Pipelines

Optional extended description

Add an optional description...

🔘 Commit directly to the main branch ②
⭕ Create a new branch for this commit

③
Save

5.3 Adding build validation to run the pipeline for each Pull Request modification / creation

1. In Azure DevOps go to *Project settings → Repositories → <Your repository name> → Policies.*
2. In the *Branch Policies* section choose the **main** branch.

Branch Policies

≡ Search branch name

Protect important branch namespaces in this repository with pre-merge checks and policies

⅋ azure-pipelines

⅋ main ⚲ Default   Compare

3. In the *Build Validation* section click on the add button to add a new build policy.

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∨ Build Validation 1

Validate code by pre-merging and building pull request changes.

⊟ Filter   +

Enabled	Name ↑	Path filter	Trigger	Inheritance
🔵 On	Required		Automatic Expires after 12 h…	

4. In the presented form for adding build policy choose your repository in the *Build pipeline* field. The rest of the parameters can be left with the default values.

Add build policy   ✕

Build pipeline *

Test3   ∨

Path filter (optional)

[   ] ⓘ

Trigger

🔘 Automatic (whenever the source branch is updated)

⚪ Manual

Policy requirement

🔘 Required
Build must succeed in order to complete pull requests.

⚪ Optional
Build failure will not block completion of pull requests.

Build expiration

⚪ Immediately when ⎇ main is updated

🔘 After [12] hours if ⎇ main has been updated

Save   Cancel

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5. Click on the save button to save the changes.
6. From now on a pipeline will be run for each Pull Request creation or modification and the OpenAI Review task will add comments with the code review generated using the OpenAI.