

VERTEX CODE ANALYSIS

INTELLIGENT CODE HINTS WITH EASY ACCESS



Needs explanation

TEAM "ATTIC ENGINEERS"



It is 2023

There exist AI-based code completion tools

But no AI-based code analysers

VERTEX CODE ANALYSIS

Our idea



use language models from Google for static code analysis



integrate with Visual Studio Code



create a web demo for anyone to try



VERTEX CODE ANALYSIS

BEYOND SIMPLE LINTERS

Conventional code analysis:

- > style checking
- > type checking
- > security issues (rule-based)

 Pylint



 flake8

 **Bandit**

AI-based code analysis:

- > find potential bugs, based on syntax and semantics
- > suggest code optimisations
- > promote best coding practices




See in action — Visual Studio Code

```
1  from math import *
2
3  def calculate_area(diameter: str) -> int:
4      radius = diameter / 2
5      area = 3.141592653589793 * radius ** 2
6      return area
7
```

What is wrong with this code?



AI can tell you that

```
✓  Calculate circle area.py vertex_code_analysis/poor_code_examples 2
  ⚠ def calculate_area(diameter: float) -> int: # Do not use ``str`` type in parameter type annotations. Use ``float`` or ``int`` instead. [Ln 3, Col 1]
  ⚠ area = math.pi * radius ** 2 # Do not manually calculate 3.141592653589793. Use the built-in function ``math.pi`` instead. [Ln 5, Col 1]
```

See in action — Visual Studio Code

Get useful advice even when you don't expect it.

```
def sum_product_with_for_loop(array1, array2) -> int:
    sum = 0
    for i, j in zip(array1, array2):
        sum += i * j
    return sum
```

```
sum = np.sum(array1 * array2) # You can use a numpy function to
calculate the product of two arrays instead of a for loop.
```

[View Problem \(F2\)](#) No quick fixes available

```
array1 = np.random.randint(0, 100, 1000000)
array2 = np.random.randint(0, 100, 1000000)
print(sum_product_with_for_loop(array1, array2))
```

See in action — web demo

 vertex-code-analysis.streamlit.app 

Welcome to Vertex Code Analyser! 🌴

This is a static code analysis tool based on Google PaLM.

Try in the browser

Your code:

```
1 import pandas as pd
2
3 df = pd.DataFrame({'x': [1, 2, 3], 'y': [4, 5, 6]})
4
5 for index, row in df.iterrows():
6     df.loc[index, 'z'] = row['x'] * row['y']
7
8
9
10
```

AI suggestions will appear here

```
1
2
3
4 # Use the vectorized operation instead of the loop. It will b
i 5 df['z'] = df['x'] * df['y']
6
7
8
9
10
```

APPLY (CMD+ENTER)

VERTEX CODE ANALYSIS

Why do we believe in this

- > Organisations increasingly adopt subscription-based productivity apps for developers.
- > Individuals are also ready to pay small fees for bigger performance boost.
- > Writing code is just part of the job, not smaller than fixing and improving it.



Thank you for your attention!

🌴 AND STAY TUNED 🌴

Demo: vertex-code-analysis.streamlit.app

GitHub: [romech/vertex-code-analysis](https://github.com/romech/vertex-code-analysis)

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