

Assignment 8

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Source code:

```
1  def read_file_data(filename):
2      """
3      Read all the content of the given file.
4
5      Parameters:
6          filename (str): The name of the text file to read.
7
8      Returns:
9          str or None: The content of the file as a string, or None if the file is not found.
10     """
11     try:
12         # Open the file in read mode
13         with open(filename, 'r') as file:
14             return file.read()
15     except FileNotFoundError:
16         return None
17
18
19 def count_all_words(file_content):
20     """
21     Count the occurrences of each word in the given file content.
22
23     Parameters:
24         file_content (str): The content of the text file as a string.
25
26     Returns:
27         dict or None: A dictionary where keys are words, and values are the counts,
28         or None if the file content is None.
29     """
30     if file_content is None:
31         return None
32
33     # Convert all words to lowercase and split the content into individual words
34     words = file_content.lower().split()
35
36     # Remove punctuation from each word
37     words = [word.strip(",.!?;:'\"()[]{}<>") for word in words]
38
39     # Count word occurrences using a dictionary
40     word_freq = {}
41     for word in words:
42         if word:
43             word_freq[word] = word_freq.get(word, 0) + 1
44
45     return word_freq
```

Figure 1: Source code part 1.



```

1  def display_word_data(word_freq):
2      """
3      Display the frequency of words in alphabetical order along with the total number of words.
4
5      Parameters:
6          word_freq (dict or None): A dictionary where keys are words, and values are the counts,
7                                   or None if the file is not found.
8      """
9      if word_freq is None:
10         print("OOPS!, Sorry.\nThe file with the given name doesn't exist!")
11     else:
12         print("Word with their frequency in the file:")
13         print("-----")
14         for word, count in sorted(word_freq.items()):
15             print(f"{word}: {count}")
16         print(f"\nTotal word count in the file is: {sum(word_freq.values())}")
17
18
19 def main():
20     # Ask the user to specify the name of the text file to be read
21     filename = input("Enter the name of the text file: ")
22     # Parse the file name to lower case to make it case-insensitive
23     filename = filename.lower()
24
25     # Read the content inside the file
26     file_content = read_file_data(filename)
27
28     # Count the occurrence of the words
29     word_freq = count_all_words(file_content)
30
31     # Display word frequencies
32     display_word_data(word_freq)
33
34
35 if __name__ == "__main__":
36     main()
37

```

Figure 2: Source code part 2.

Test case 1: Valid file

The screenshot shows a code editor with two tabs: `assign8_901142.py` and `sample.txt`. The `sample.txt` tab is active, displaying the following text:

```
1 This file contains multi line texts.  
2 It will be used to test the program  
3 that will count word frequency.  
4  
5 The program is case-insensitive.  
6  
7 Punctuation marks are be disregarded.  
8  
9 Let's begin the testing !  
10
```

The `assign8_901142.py` tab shows the following Python code:

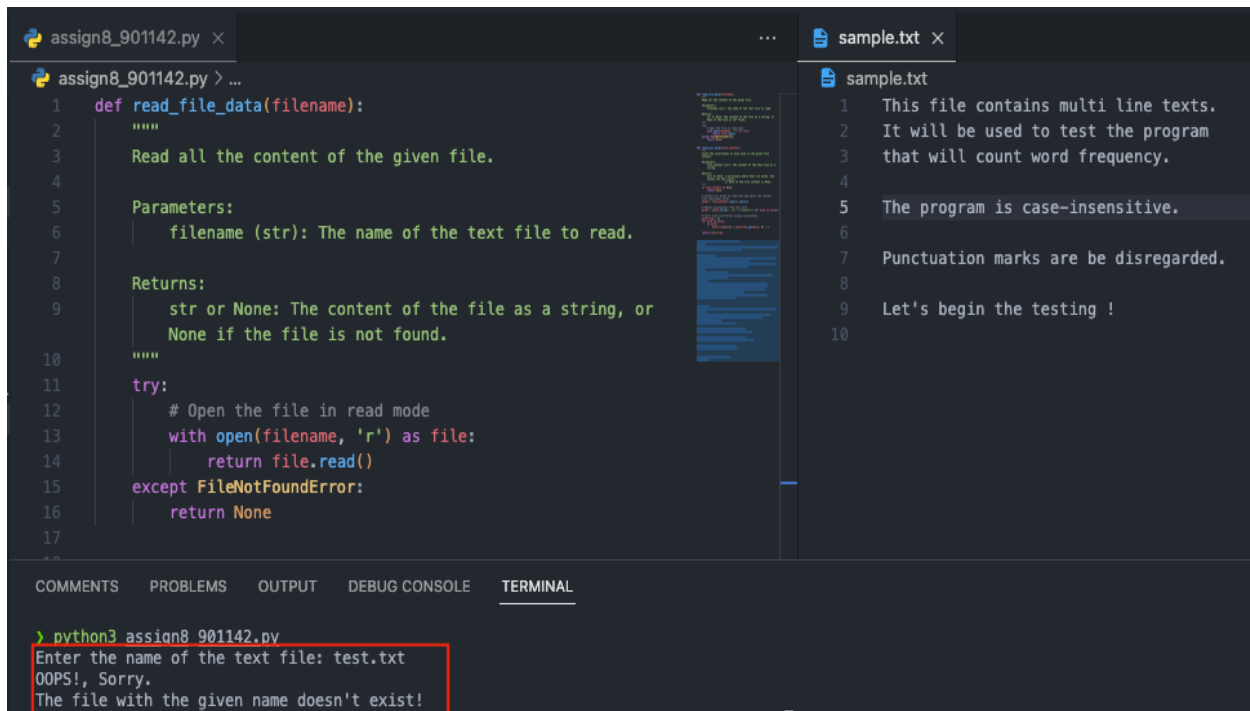
```
1 def read_file_data(filename):  
2     """  
3     Read all the content of the given file.  
4  
5     Parameters:  
6         filename (str): The name of the text file to read.  
7  
8     Returns:  
9         str or None: The content of the file as a string, or  
10        None if the file is not found.  
11    """  
12    try:  
13        # Open the file in read mode  
14        with open(filename, 'r') as file:  
15            return file.read()  
16    except FileNotFoundError:  
17        return None
```

The terminal output at the bottom shows the execution of the script:

```
> python3 assign8_901142.py  
Enter the name of the text file: sample.txt  
Word with their frequency in the file:  
-----  
are: 1  
be: 2  
begin: 1  
case-insensitive: 1  
contains: 1  
count: 1  
disregarded: 1  
file: 1  
frequency: 1  
is: 1  
it: 1  
let's: 1  
line: 1  
marks: 1  
multi: 1  
program: 2  
punctuation: 1  
test: 1  
testing: 1  
texts: 1  
that: 1  
the: 3  
this: 1  
to: 1  
used: 1  
will: 2  
word: 1  
Total word count in the file is: 32
```

Figure 3: Test case when user enters valid file name.

Test case 2: Non-existent File



The screenshot shows an IDE with two tabs: 'assign8_901142.py' and 'sample.txt'. The Python script defines a function 'read_file_data' that attempts to read a file. The terminal output shows the user entering 'test.txt' and receiving an error message.

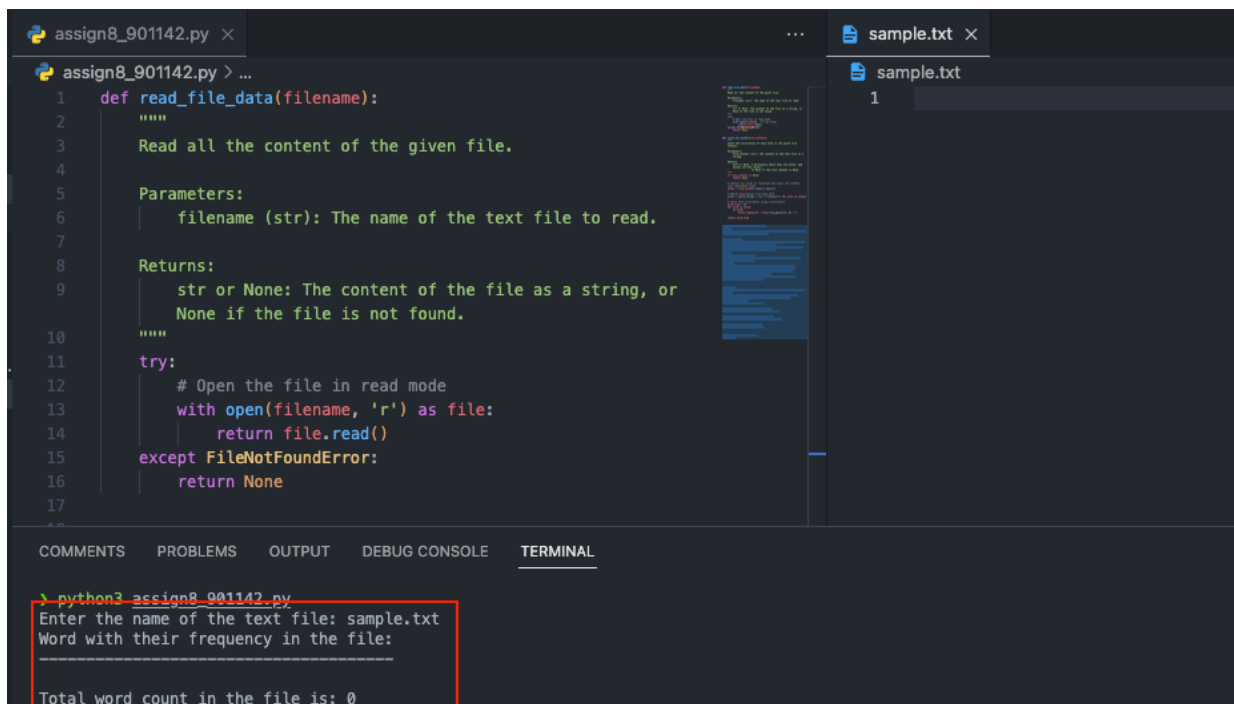
```
assign8_901142.py > ...
1 def read_file_data(filename):
2     """
3     Read all the content of the given file.
4
5     Parameters:
6     | filename (str): The name of the text file to read.
7
8     Returns:
9     | str or None: The content of the file as a string, or
10    | None if the file is not found.
11    """
12    try:
13        # Open the file in read mode
14        with open(filename, 'r') as file:
15            return file.read()
16    except FileNotFoundError:
17        return None
18
19 > python3 assign8_901142.py
Enter the name of the text file: test.txt
OOPS!, Sorry.
The file with the given name doesn't exist!
```

The 'sample.txt' tab contains the following text:

```
sample.txt
1 This file contains multi line texts.
2 It will be used to test the program
3 that will count word frequency.
4
5 The program is case-insensitive.
6
7 Punctuation marks are be disregarded.
8
9 Let's begin the testing !
10
```

Figure 4: Test case when user enters the file name that doesn't exist.

Test case 3: File is empty



The screenshot shows the same IDE with the 'assign8_901142.py' script. The terminal output shows the user entering 'sample.txt' and receiving a word count of 0.

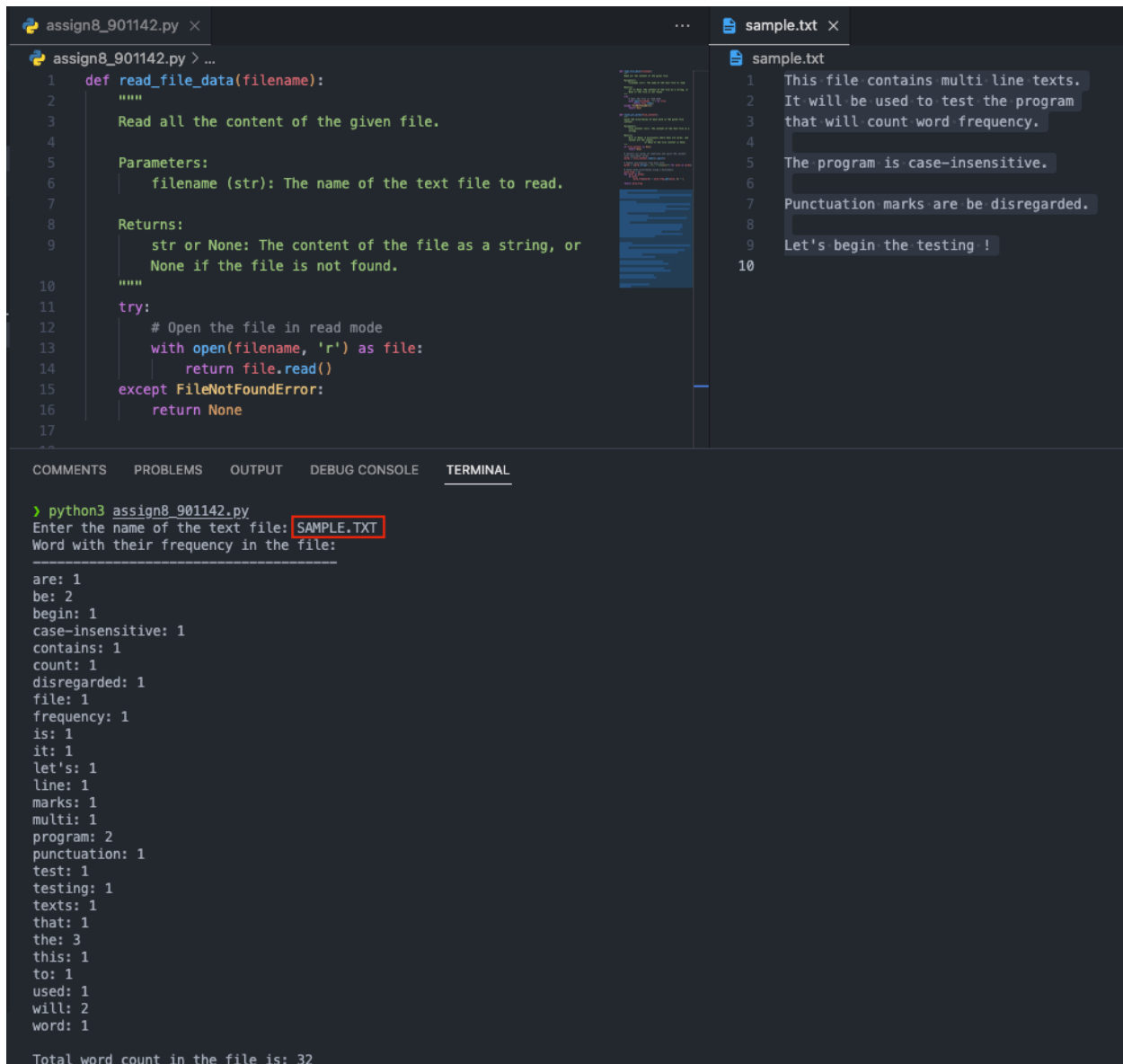
```
assign8_901142.py > ...
1 def read_file_data(filename):
2     """
3     Read all the content of the given file.
4
5     Parameters:
6     | filename (str): The name of the text file to read.
7
8     Returns:
9     | str or None: The content of the file as a string, or
10    | None if the file is not found.
11    """
12    try:
13        # Open the file in read mode
14        with open(filename, 'r') as file:
15            return file.read()
16    except FileNotFoundError:
17        return None
18
19 > python3 assign8_901142.py
Enter the name of the text file: sample.txt
Word with their frequency in the file:
...
Total word count in the file is: 0
```

The 'sample.txt' tab contains the following text:

```
sample.txt
1
```

Figure 5: Test case when user enters the file which is empty.

Test case 4: Case Sensitivity



```
assign8_901142.py x ... sample.txt x
assign8_901142.py > ...
1 def read_file_data(filename):
2     """
3     Read all the content of the given file.
4
5     Parameters:
6     filename (str): The name of the text file to read.
7
8     Returns:
9     str or None: The content of the file as a string, or
10    None if the file is not found.
11    """
12    try:
13        # Open the file in read mode
14        with open(filename, 'r') as file:
15            return file.read()
16    except FileNotFoundError:
17        return None
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