Assignment 3

Instructions: Complete the following 5 programs and submit your solutions by the deadline on Google Classroom. Make sure to test your code thoroughly and use proper indentation and comments.

Due: Friday, 28 March 2025   *Total Marks: 50*

Program 1: Function Practice

Write a function `count_vowels(s)` that takes a string `s` as input and returns the number of vowels (a, e, i, o, u) in the string. Use this function in a program that takes user input and prints the number of vowels.

Example Input:

Enter a string: `Hello World`

Example Output:

`Number of vowels: 3`

Program 2: String Manipulation

Write a function `reverse_words(s)` that takes a string `s` as input and returns the string with each word reversed. Use this function in a program that takes user input and prints the reversed string.

Example Input: `Enter a string: Python is fun`

Example Output:

`Reversed string: nohtyP si nuf`

Program 3: File Handling

Write a program that reads a text file (`example.txt`) and counts the number of lines, words, and characters in the file. Save the results in a new file (`output.txt`).

Example Input (example.txt):

```
Hello World
Python is fun
```

Example Output (output.txt):

```
Lines: 2
Words: 5
Characters: 24
```

Program 4: Error Handling

Write a function `divide_safe(a, b)` that divides two numbers and handles all possible errors (e.g., `ZeroDivisionError`, `TypeError`). Return `None` if an error occurs. Use this function in a program that takes user input and prints the result of the division.

Example Input:

```
Enter two numbers: 10 0
```

Example Output:

```
Error: Cannot divide by zero.
Result: None
```

Program 5: Modules and Libraries

Write a Python script that uses the `os` module to list all files in a directory/folder and its subdirectories. Save the list of file paths to a text file (`file_list.txt`).

Example Output (file_list.txt):

```
Files in directory:
```

```
-  /path/to/file1.txt
-  /path/to/file2.py
-  /path/to/subdir/file3.csv
```

Note:

1. Use proper **indentation** and **comments** in your code.
2. Test your programs with different inputs to ensure they work correctly.
3. Submit your solutions by the deadline.

Good luck!