ZETTABYTE
OPTIMIZE THE WORLD IN ONE CLICK.

AWS EdStart Member

AI Technical Test

You have 60 minutes to complete the test

Part 1: Multiple-Choice Questions (10 points)

Which of the following data types is immutable in Python?

a) List

b) Tuple

c) Dictionary

d) Set

What does the __init__ method do in a Python class?

a) Initialize class attributes

b) Create a new instance of the class

c) Define the class constructor

d) None of the above

How do you open a file named "example.txt" in read-only mode in Python?

a) file = open("example.txt", "r")

b) file = open("example.txt", "w")

c) file = open("example.txt", "a")

d) file = open("example.txt", "rb")

What is the output of the following code snippet?

```
x = [1, 2, 3]
y = x
y.append(4)
print(x)
```

a) [1, 2, 3]

b) [1, 2, 3, 4]

c) [1, 2, 3, 4, 4]

d) [1, 2, 3, 4, 4, 4]

In Python, what does the range(1, 5) function return?

a) [1, 2, 3, 4]

b) [1, 2, 3, 4, 5]

c) (1, 5)

d) It's an error

Part 2: Coding Exercises (40 points)

1. Write a Python function to calculate the factorial of a given non-negative integer. The function signature should be:

   ```
   def factorial(n):
   # Your code here
   ```

2. Create a Python class called Circle with attributes radius and methods area and circumference. Implement the class such that:

- The area method calculates and returns the area of the circle.
- The circumference method calculates and returns the circumference of the circle.
- The radius can be set during object creation and retrieved using the radius attribute.

3. Given a list of integers, write a Python function to find the sum of all even numbers in the list. The function signature should be:

   ```
   def sum_of_evens(numbers):
   # Your code here
   ```

Part 3: Bonus (10 points)

1. Explain the difference between a shallow copy and a deep copy in Python. Provide an example for each.

Part 4: Coding Exercise (20 points)

1. Write a Python program that reads a text file named "input.txt" and counts the frequency of each word in the file. Then, write the word frequencies to an output file named "output.txt" in the format:

   ```
   word1: frequency1
   word2: frequency2
   ..
   ```