CS 302/352: Computer graphics

Lab Assignment #1

Python Tutorial Based Assignment

Objective Questions

1. What is the output of the following code?

```
x = 10
y = 3
print(x // y, x % y)
```

A) 3, 1 B) 3, 3 C) 3.33, 1 D) 10, 3

2. Which of the following is a valid complex number in Python?

A) `3 + 4j` B) `3.0j + 4.0`

C) `complex(3, 4)` D) `All of the above`

3. Identify the correct statement regarding Python Booleans:

A) `and`, `or`, and `not` are symbols for Boolean operators.

B) Boolean values are case-insensitive.

C) `True` and `False` are valid Boolean literals.

D) Boolean values cannot be converted to integers.

4. What is the result of the following slicing operation?

```
nums = [1, 2, 3, 4, 5]
print(nums[1:4])
```

A) `[2, 3, 4]` B) `[1, 2, 3]`

C) `[2, 3]` D) `[3, 4, 5]`

5. How do you declare an empty set in Python?

A) `set()` B) `{}`

C) `[]` D) `None`

Coding Problems

Basic Operations with Numbers

1. **Write a program to:**
   a. Define an integer `x` and a float `y`.
   b. Print their sum, difference, product, and quotient.
   c. Use shorthand operators to modify `x` and print the updated value.
2. **String Manipulation**
   a. Create a function `format_string(name, age)` that takes a name and age as input and returns a formatted string:
   `"My name is <name> and I am <age> years old."`
   b. Use both `.format()` and f-strings to implement the solution.

3. **List Operations**
   Write a program to:
   a. Create a list of numbers from 1 to 10.
   b. Print the square of each number using list comprehension.
   c. Extract all even numbers from the list using slicing.
4. **Dictionary Manipulation**
   Create a dictionary to store the names and marks of three students. Write a function to:
   a. Add a new student to the dictionary.
   b. Retrieve the marks of a specific student using their name.
   c. Print the dictionary in sorted order of names.
5. **Set Operations**
   Write a program to:
   a. Create two sets of integers.
   b. Perform union, intersection, and difference operations between the sets.
   c. Print the unique elements from both sets in a single list.
6. **Tuples and Functions**
   Write a function `tuple_operations()` that:
   a. Takes a tuple of integers as input.
   b. Returns the maximum, minimum, and the sum of all elements in the tuple.

Instructions

- Include comments in your code explaining each step.
- Ensure your code handles edge cases (e.g., empty lists or sets).
- Submit your answers in a pdf file with format: assignment1_<roll. no.>.pdf.