

Homework Assignment: Python Fundamentals

Assignment Instructions: In this assignment, you will be working on various Python topics, including data types, syntax, coding using data types, functions, function arguments, and return statements. Make sure to complete each exercise and provide clear explanations or code where required.

Exercise 1: Data Types and Variables (10 points)

Define and assign values to variables of different data types: integer, float, string, and boolean. Explain what each data type represents in Python.

Exercise 2: Basic Syntax (10 points)

Write a Python program that prints "Hello, Python!" to the console. Ensure your code follows correct Python syntax.

Exercise 3: Coding with Data Types (15 points)

Create a Python program that calculates the area of a rectangle. The program should:

- Prompt the user to enter the length and width of the rectangle.
- Use the appropriate data types to store these values.
- Calculate and display the area.
- Ensure that the program handles invalid input gracefully.

Exercise 4: Functions (20 points)

Define a Python function called `calculate_discount(price, discount_percentage)` that calculates the discounted price of an item. The function should take the original price and the discount percentage as arguments and return the discounted price. Test this function with an original price of \$50 and a discount percentage of 20%.

Exercise 5: Function Arguments and Return Statements (25 points)

Write a Python program that defines a function `calculate_total_cost(item_price, tax_rate, discount_percentage)` to calculate the total cost of an item. The function should:

- Accept the item's price, tax rate, and discount percentage as arguments.
- Calculate the final cost by applying the discount first and then adding tax.
- Return the total cost.
- Test the function with an item price of \$75, a tax rate of 8%, and a discount of 15%.

Exercise 6: Definitions (20 points)

Define and explain the following Python terms:

- Variable Scope
- Function Parameter
- Return Statement
- Syntax Error
- Data Type Conversion

Submission Instructions:

1. Write your Python code for Exercises 2, 3, 4, and 5 in a single `.py` file.
2. Provide explanations for Exercise 1 and Exercise 6 in a separate text document.
3. Submit your completed assignment via your preferred method (email, online learning platform, etc.) by [Submission Due Date].

Grading: Your assignment will be graded based on correctness, adherence to Python coding conventions, clarity of explanations, and proper handling of data types, functions, and syntax. Ensure that your code is well-documented and organized.