CHAIFETZ
SCHOOL OF BUSINESS
SAINT LOUIS UNIVERSITY

Title: Homework Assignment: Python and LaTeX Practice

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1 Introduction

This report reviews the solutions to Python exercises along with the relevant mathematical explanations and a brief reflection on the skills learned and the challenges faced.

2 Python Code

Presented here is the Python code corresponding to the assignment:

2.1 Q1. Basic Data Types

```
#1 Create two variables: `x = 5` (integer) and `y = 2.5` (
   float).
x = 5
#2 Perform the following operations and print the result:
y = 2.5
#3 Add `x` and `y`.
print(x+y)
#4 Subtract `x` from `y`
print(y-x)
#5 Multiply `x` by `y`
print(x*y)
#6 Raise `x` to the power of 2.
print(x**2)
#7 Use floor division (`//`) to divide `x` by 2.
print(x//2)
```

2.2 Q2. Lists

```
#1 Create a list `my_list = [1, 2, 3, 4, 5]`.
my_list = [1, 2, 3, 4, 5]
```

```
#2 Replace the third element with `"hello"`.
my_list = [1, 2, "Hello", 4, 5]
#3 Add the element `"world"` to the end of the list.
my_list = [1, 2, "Hello", 4, "World"]
#4 Remove the first element from the list.
my_list = [2, "Hello", 4, "World"]
#5 Print the final list.
print(my_list)
```

2.3 Q3. Dictionaries

```
#1 Create a dictionary `student_scores` with the following key
   -value pairs: '"Alice": 85', '"Bob": 90', '"Charlie": 78'
student_scores = {'Alice': 85, 'Bob': 90,'Charlie': 78}
#2 Add a new student ''David'' with a score of `88`.
student_scores['David'] = 88
#3 Update ''Alice''s score to `95`.
student_scores['Alice'] = 95
#4 Delete ''Charlie'' from the dictionary.
del student_scores['Charlie']
#5 Print the final dictionary.
print(student_scores)
```

2.4 Q4. Functions

```
#1a Define a function `calculate_area` that calculates the
   area of a rectangle
def calculate_area(width, height):
    #1b Formula for the area of a rectangle: Area = width *
       height
```

```
    return width * height

#2 Call the function with `width = 5` and `height = 10`
result = calculate_area(5, 10)

# Print the result
result
```

2.5 Q5. Classes and Inheritance

```
#1 Create a class `Animal` with methods `__init__` and `speak`
class Animal:
    def __init__(self, name):
        self.name = name

    def speak(self):
        print("The animal speaks")

#2 Create a subclass `Dog` that inherits from `Animal` and
   overrides `speak`
class Dog(Animal):
    def speak(self):
        print("Woof! Woof!")

#3 Create an instance of `Dog` with the name `"Buddy"` and
   call its `speak` method
dog = Dog("Buddy")
dog.speak()  #print "Woof! Woof!"
```

3 Mathematical Explanation

Task 4: The equation used to determine the area of a rectangle is:

$$A = \text{width} \times \text{height}$$

where A represents the area, and the width and height are the rectangle's dimensions.

4 Conclusion

This assignment was a great opportunity for me to practice both Python and LaTeX. I was able to work with basic Python concepts like data types, lists, dictionaries, and functions, and also explore object-oriented programming with classes. At the same time, I learned how to use LaTeX to present my code in a clean and organized way. Overall, it helped me improve my understanding of programming and technical writing. It was a good challenge, and I feel more confident now in both areas after completing it.