Problem Set 1: Python and LaTeX Practice

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1 Introduction

This report presents the solutions to Python tasks along with the corresponding mathematical explanation. The tasks include basic data types, lists, dictionaries, functions, classes, and inheritance.

2 Python Code

Below is the Python code for the assignment:

2.1 Task 1: Basic Data Types

```
x = 5
y = 2.5
print(x + y)
print(y - x)
print(x * y)
print(x ** 2)
print(x // 2)
```

2.2 Task 2: List Manipulation

```
my_list = [1,2,3,4,5]
my_list[2] = "hello"
my_list.append("world")
my_list.pop(0)
print(my_list)
```

2.3 Task 3: Dictionaries

```
student_scores = {"Alice": 85, "Bob": 90, "Charlie": 78}
student_scores["David"] = 88
student_scores.update({"Alice" : 95})
student_scores.pop("Charlie")
print(student_scores)
```

2.4 Task 4: Functions

```
def calculate_area(width,height):
    area = width * height
    print(area)
calculate_area(5,10)
```

2.5 Task 5: Classes and Inheritance

```
class Animal:
    def __init__(self, name):
        self.name = name
    def speak(self):
        print("The animal speaks")
class Dog(Animal):
    def speak(self):
        print("Woof! Woof!")
Dog_instance = Dog("Buddy")
Dog_instance.speak()
```

3 Mathematical Explanation

The formula for calculating the area of a rectangle is given by:

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

where *area* is the area, and the width and height are the dimensions of the rectangle.

4 Conclusion

The assignment allowed me to work on fundamental Python and LaTeX concepts. Doing the tasks and class exercises again and again helped me become familiar with Python programming and document preparation.