TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

PULCHOWK CAMPUS

AN ASSIGNMENT ON

Operator Overloading in Python

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OPERATOR OVERLOADING IN PYTHON

Objective:

The objective of this assignment is to implement operator overloading for all arithmetic and relational operators in Python.

Theory:

Operator overloading in Python allows developers to redefine the behavior of built-in operators for user-defined classes. This enables intuitive interaction with objects of custom classes using standard operators like +, -, *, /, ==, <, etc.

Code:

```
class Number:
    def __init__(self, value):
        self.value = value

    # Arithmetic operators
    def __add__(self, other):
        return Number(self.value + other.value)

    def __sub__(self, other):
        return Number(self.value - other.value)

    def __mul__(self, other):
        return Number(self.value * other.value)

    def __truediv__(self, other):
        return Number(self.value / other.value)

    def __floordiv__(self, other):
        return Number(self.value // other.value)

    def __mod__(self, other):
        return Number(self.value % other.value)

    def __pow__(self, other):
        return Number(self.value ** other.value)
```

```
    # Relational operators
    def __eq__(self, other):
        return self.value == other.value

    def __ne__(self, other):
        return self.value != other.value

    def __lt__(self, other):
        return self.value < other.value

    def __le__(self, other):
        return self.value <= other.value

    def __gt__(self, other):
        return self.value > other.value

    def __ge__(self, other):
        return self.value >= other.value

    def __str__(self):
        return str(self.value)


# Example Usage
a = Number(10)
b = Number(5)

print("Addition:", a + b)
print("Subtraction:", a - b)
print("Multiplication:", a * b)
print("Division:", a / b)
print("Floor Division:", a // b)
print("Modulus:", a % b)
print("Power:", a ** b)

print("Equal:", a == b)
print("Not Equal:", a != b)
print("Less Than:", a < b)
print("Less Than or Equal:", a <= b)
print("Greater Than:", a > b)
print("Greater Than or Equal:", a >= b)
```

Output:

```
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2.0
Floor Division: 2
Modulus: 0
Power: 100000
Equal: False
Not Equal: True
Less Than: False
Less Than or Equal: False
Greater Than: True
Greater Than or Equal: True
```

Conclusion:

In this assignment, operator overloading was demonstrated for all arithmetic and relational operators in Python. This allows user-defined classes to interact with built-in operators seamlessly, enhancing code readability and flexibility.

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GitHub:

https://github.com/SushanThakur/2nd-sem-assignment/blob/master/assignments/assignment-4/code.py