

Lab Report: EECE2140 COMPUTING FUNDAMENTALS FOR ENGINEERS

Student Name: Theo Donacik

Northeastern University

College of Engineering

Department of Electrical and Computer Engineering

Course Title: EECE 2140: COMPUTING FUNDAMENTALS FOR ENGINEERS

Instructor: Fatema Nafa

February 29, 2024

Student Information

Assignment: 5

Student Name: *Theo Donacik*

Date: *February 29, 2024*

1 Class Creation

First, I created the BasicMathOperations class. This class has no fields or constructor as it does not need to store any data specific to this instance of the class.

2 Methods/Tasks

Function: Greet

This function takes two numbers as input and returns their sum.

```
Function greet
  Input: firstname, lastname
  Output: Print a greeting

  Begin
    print("Hello ", firstname, lastname, "!")
  End
```

Using the greet Function

```
# Example of calling the function
math = basicMathOperations()
math.greet("Theo", "Donacik")

# Output
Hello Theo Donacik!
```

Function: Add Numbers

This function takes 2 numbers returns their sum.

```
Function add_numbers
    Input: number1, number2
    Output: sum of number1 and number2

    Begin
        sum = number1 + number2
        return sum
    End
```

Using the add_numbers Function

```
# Example of calling the function
math = basicMathOperations()
result = math.add_numbers(5, 7)
print("The sum is:", result)

# Output
The sum is: 12
```

Function: Operation

This function takes 2 numbers and an operation and applies the operation.

```
Function operation
  Input: number1, number2, operator
  Output: Result of operation on number1 and number2

  Begin
    switch(operator):
      case "+": return number1 + number2
      case "-": return number1 - number2
      case "*": return number1 * number2
      case "/": return number1 / number2
      else: throw error "Invalid operator"
  End
```

Using the operation Function

```
# Example of calling the function
math = basicMathOperations()
result = math.operation(5, 7, "+")
print("The result is:", result)

# Output
The result is: 12
```

Function: Calculate Square

This function takes a number and returns its square.

```
Function calculateSquare
    Input: num
    Output: The square of num

    Begin
        return num ^ 2
    End
```

Using the calculateSquare function

```
# Example of calling the function
math = basicMathOperations()
result = math.calculateSquare(5)
print("The result is:", result)

# Output
The result is: 25
```

Function: Factorial

This function takes a number and returns its factorial.

```
Function factorial
    Input: num
    Output: The factorial of num

    Begin
        fact = 1
        for i in range(num):
            fact *= i+1
        return fact
    End
```

Using the factorial function

```
# Example of calling the function
math = basicMathOperations()
result = math.factorial(5)
print("The result is:", result)

# Output
The result is: 120
```

Function: Counting

This function takes a start and an end and prints counting from start to end.

```
Function factorial
  Input: start, end
  Output: Prints count from start to end

  Begin
    for i in range(start, end+1):
      print(i)
  End
```

Using the counting function

```
# Example of calling the function
math = basicMathOperations()
math.counting(5, 10)

# Output
5 6 7 8 9 10
```


Function: Calculate Hypotenuse

This function computes the hypotenuse of a right-angle triangle.

```
Function calculateHypotenuse
    Input: base, perpendicular
    Output: The hypotenuse of the right angle triangle

    Begin
        return ((self.calculateSquare(base) +
                  self.calculateSquare(perpendicular)) ^ .5)
    End
```

Using the calculateHypotenuse function

```
# Example of calling the function
math = basicMathOperations()
result = math.calculateHypotenuse(6, 8)
print("The result is:", result)

# Output
The result is: 10
```

Function: area

This function computes the area of a rectangle.

```
Function area
    Input: width, height
    Output: The area of the rectangle

    Begin
        return width * height
    End
```

Using the area function

```
# Example of calling the function
math = basicMathOperations()
result = math.area(6, 5)
print("The result is:", result)

# Output
The result is: 30
```

Function: power

This function computes the base to the power of the exponent.

```
Function area
  Input: base, exponent
  Output: Base to the power of exponent

  Begin
    return base ** exponent
  End
```

Using the power function

```
# Example of calling the function
math = basicMathOperations()
result = math.power(2, 3)
print("The result is:", result)

# Output
The result is: 8
```

Function: type

This function gets the type of its argument.

```
Function type
  Input: val
  Output: The type of val

  Begin
    return type(val)
  End
```

Using the type function

```
# Example of calling the function
math = basicMathOperations()
result = math.tyoe(2)
print("The result is:", result)

# Output
The result is: int
```

3 Main function