Lab Report: EECE2140 COMPUTING FUNDAMENTALS FOR ENGINEERS

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Student Information

Assignment: *5*
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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

For the main function, I use a while loop asking for user input to handle interactivity. The user can input their action, and is then prompted for the inputs for each function. The user can use the program until they quit by inputting an option.