Assignment 3

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1 Assignment 3

2 Week 3

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5 Exercise 1

5.0.1 Write a lambda expression to get the product of two numbers.

5.0.2 Run test for expression(5,6)

5.0.3 Output:30

```
[22]: # Lambda expression to multiply two numbers
expression = lambda x, y: x * y

# Test the lambda function with values (5,6)
result = expression(5, 6)

# Print the output
print("Output:",result)
```

Output: 30

6 Exercise 2

6.0.1 Write a function to get the area of a circle from the radius.

6.0.2 Hint: Remember to import the right module to calculate the area of the circle.

6.0.3 Run test for function(10)

6.0.4 Output:314.1592653589793

```python
[23]: import math   # Import the math module to use pi
      # Function to calculate the area of a circle
      def circle_area(radius):
          return math.pi * radius**2

      # Test the function with radius 10
      result = circle_area(10)

      # Print the output
      print("Output:",result)
```

```
Output: 314.1592653589793
```

7 Exercise 3

7.0.1 Build a simple calculator which can:add, subtract, multiply, divide.

7.0.2 Hint: Solve by writing a function that takes two numbers as an argument and the operation and returns the desired output.

7.0.3 Run test for function(2,5,'d')

7.0.4 Output: 0.4

```python
[24]: # Function to perform basic arithmetic operations
      def calculator(a, b, operation):
          if operation == 'a':  # Addition
              return a + b
          elif operation == 's':  # Subtraction
              return a - b
          elif operation == 'm':  # Multiplication
              return a * b
          elif operation == 'd':  # Division
              if b != 0:
                  return a / b
              else:
                  return "Error: Division by zero"
          else:
              return "Invalid operation"

      # Test the function with (2, 5, 'd')
```

```
result = calculator(2, 5, 'd')

# Print the output
print("Output: ",result)
```

Output: 0.4

8 Exercise 4

8.0.1 Define a class named Rectangle which can be constructed by a length and width.

8.0.2 The Rectangle class has a method which can compute the area.

8.0.3 Run test for r = Rectangle(5,10)

8.0.4 r.area()

8.0.5 Output: 50

```
[25]: class Rectangle:
          def __init__(self, length, width):
              self.length = length
              self.width = width

          def area(self):
              return self.length * self.width

      # Run test
      r = Rectangle(5, 10)
      print("Output: ",r.area())   # Output: 50
```

Output: 50

9 Exercise 5

9.0.1 Define a class named Shape and its subclass Square.

9.0.2 Shapeobjects can be consrtucted by name andlengthhas an area function wich return 0

9.0.3 Square subclass has an init function which take a length and name as argumentand has anarea method and a describe method what prints the name of the Shape.

9.0.4 Print the area from Square class.

9.0.5 Run test for:s = Square('square',5)

9.0.6 print(s.area())

9.0.7 print(s.describe())

9.0.8 Output: The area is: 25

9.0.9 This is a: square

```python
[26]: class Shape:
          def __init__(self, name):
              self.name = name

          def area(self):
              return 0

      class Square(Shape):
          def __init__(self, name, length):
              super().__init__(name)
              self.length = length

          def area(self):
              return self.length * self.length

          def describe(self):
              return f"This is a: {self.name}"

      # Run test
      s = Square('square', 5)
      print(f"Output: The area is: {s.area()}")  # Output: The area is: 25
      print(s.describe())  # Output: This is a: square
```

```
Output: The area is: 25
This is a: square
```

```
[ ]:
```