Untitled

February 15, 2026

Homework

Assingment 1

```python
[13]: product = lambda x, y: x * y
      result = product(5, 6)
      print(f"The product of 5 and 6 is: {result}")
```

The product of 5 and 6 is: 30

Assingment 2

```python
[14]: import math

      def calculate_circle_area(radius):
          """
          Calculates the area of a circle given its radius.

          Args:
              radius (float or int): The radius of the circle.

          Returns:
              float: The area of the circle.
          """
          if radius < 0:
              return "Radius cannot be negative."
          area = math.pi * (radius ** 2)
          return area

      # --- Test the function ---
      test_radius = 10
      area_result = calculate_circle_area(test_radius)

      print(f"The radius used for the test is: {test_radius}")
      print(f"The calculated area of the circle is: {area_result}")
```

The radius used for the test is: 10
The calculated area of the circle is: 314.1592653589793

Assingment 3

```
[15]: def calculator(number1, number2, operation):
          """
          Performs basic arithmetic operations on two numbers.

          Args:
              number1 (float or int): The first number.
              number2 (float or int): The second number.
              operation (str): The operation to perform:
                                'a' for addition,
                                's' for subtraction,
                                'm' for multiplication,
                                'd' for division.

          Returns:
              float or str: The result of the operation, or an error message for␣
      ↪invalid inputs.
          """
          if operation == 'a':
              return number1 + number2
          elif operation == 's':
              return number1 - number2
          elif operation == 'm':
              return number1 * number2
          elif operation == 'd':
              if number2 != 0:
                  return number1 / number2
              else:
                  return "Error: Division by zero is not possible."
          else:
              return "Error: Invalid operation specified. Use 'a', 's', 'm', or 'd'."

      # Run test for function(2, 5, 'd') in a Jupyter Notebook
      result = calculator(2, 5, 'd')
      print(f"The result of 2 divided by 5 is: {result}")
```

```
The result of 2 divided by 5 is: 0.4
```

Assingment 4

```
[16]: class Rectangle:
          """A rectangle that is described by its length and width."""
          def __init__(self, length, width):
              self.length = length
              self.width = width

          def area(self):
              """Return the area of the rectangle."""
              return self.length * self.width
```

```
r = Rectangle(5, 10)

print(f"The area of the rectangle is: {r.area()}")
```

The area of the rectangle is: 50

Assingment 5

[17]:
```python
class Shape:
    """A base class for geometric shapes."""
    def __init__(self, name, length=0):
        self.name = name
        self.length = length

    def area(self):
        """Calculates the area of the shape."""
        return 0

class Square(Shape):
    """A subclass representing a square."""
    def __init__(self, name, length):
        super().__init__(name, length)

    def area(self):
        """Calculates the area of the square (length * length)."""
        return self.length * self.length

    def describe(self):
        """Prints the name of the shape."""
        print(f"This shape is a {self.name}.")

s = Square('square', 5)
print(s.area())
print(s.describe())
```

25
This shape is a square.
None

[ ]:
```
```