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0.1 Assignment 3

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0.4 Exercise 1

[1]:
```
product = lambda x, y: x * y

result = product(5, 6)
print(result)
```

```
30
```

0.5 Exercise 2

[2]:
```
import math

def circle_area(radius):
    """Calculate the area of a circle given its radius."""
    return math.pi * radius ** 2

print(circle_area(10))
```

```
314.1592653589793
```

0.6 Exercise 3

[3]:
```
def calculator(a, b, operation):
    """Perform basic arithmetic operations."""
    if operation == 'a':
        return a + b
    elif operation == 's':
        return a - b
    elif operation == 'm':
        return a * b
    elif operation == 'd':
        return a / b if b != 0 else "Error: Division by zero"
    else:
        return "Invalid operation"
```

```
print(calculator(2, 5, 'd'))
```

```
0.4
```

0.7 Exercise 4

[4]:
```
class Rectangle:
    """A class to represent a rectangle."""

    def __init__(self, length, width):
        """Initialize the rectangle with length and width."""
        self.length = length
        self.width = width

    def area(self):
        """Compute and return the area of the rectangle."""
        return self.length * self.width

r = Rectangle(5, 10)
print(r.area())
```

```
50
```

0.8 Exercise 5

[5]:
```
class Shape:
    """A base class for different shapes."""

    def __init__(self, name, length):
        """Initialize shape with a name and length."""
        self.name = name
        self.length = length

    def area(self):
        """Return default area, which is 0 for generic shapes."""
        return 0


class Square(Shape):
    """A subclass of Shape that represents a square."""

    def __init__(self, name, length):
        """Initialize square with a name and length."""
        super().__init__(name, length)

    def area(self):
        """Compute and return the area of the square."""
```

```
        return self.length ** 2

    def describe(self):
        """Return a description of the square."""
        return f"This is a: {self.name}"

s = Square('square', 5)
print(f"The area is: {s.area()}")
print(s.describe())
```

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