CSE 160: Functions and Abstraction - Answer Sheet

Instructor: Alessia S. Fitz Gibbon

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Practice Problem 1:

Problem: Write a Python function `cube(x)` that returns the cube of its argument `x`. Call this function for different values and print the results.
    Answer:

```
def cube(x):
    return x * x * x

# Test cases
print(cube(2))    # Output: 8
print(cube(3))    # Output: 27
print(cube(4))    # Output: 64
```

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Practice Problem 2:

Problem: Define a function `celsius_to_fahr(celsius)` that converts Celsius to Fahrenheit using the formula $\texttt{fahr} = \frac{9}{5} \times \texttt{celsius} + 32$. Use this function to convert 100 degrees Celsius to Fahrenheit.
    Answer:

```
def celsius_to_fahr(celsius):
    return (celsius * 9/5) + 32

# Test case
print(celsius_to_fahr(100))  # Output: 212.0
```

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Practice Problem 3:

Problem: Write a function `calculate_area(length, width)` that calculates and returns the area of a rectangle. Call the function for a rectangle with length 5 and width 10, and print the result.

Answer:

```python
def calculate_area(length, width):
    return length * width

# Test case
print(calculate_area(5, 10))  # Output: 50
```

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Practice Problem 4:

Problem: Define a function `max_of_three(a, b, c)` that returns the maximum of three numbers. Use this function to find the maximum of 5, 10, and 8.

Answer:

```python
def max_of_three(a, b, c):
    if a > b:
        if a > c:
            return a
        else:
            return c
    else:
        if b > c:
            return b
        else:
            return c

# Test case
print(max_of_three(5, 10, 8))  # Output: 10
```

Practice Problem 5:

Code:

```
x = 10  # Global variable

def my_function():
    x = 3  # Local variable
    print("Inside the function, x =", x)

my_function()
print("Outside the function, x =", x)
```

1. **What is the value of x inside the function?**

   Inside the function, x is a local variable set to 3. So, the output will be:
   ```
   Inside the function, x = 3
   ```

2. **What is the value of x outside the function?**

   Outside the function, x is the global variable, which is still 10. The function does not modify the global variable. So, the output will be:
   ```
   Outside the function, x = 10
   ```