perplexity

solve all the questions in python with heading added as comment in each program on top of program

Here are the solutions to all the assignment questions in Python, with appropriate headings added as comments at the top of each program:

```
# Lambda Functions & Map
# Program to square numbers from 1 to 20 using lambda and map

# List of numbers from 1 to 20
numbers = list(range(1, 21))

# Lambda function to square each number
squared_numbers = list(map(lambda x: x**2, numbers))

# Print the squared numbers
print(squared_numbers)
```

```
# Custom Module Creation and Importing
# Creating a module named utilities.py for factorial calculation

# Step 1: Create the module utilities.py
module_code = """\ndef factorial(num):\n    \"\"\"Function to calculate factorial of a nu

# Write the module to a file
with open("utilities.py", "w") as file:
    file.write(module_code)

# Step 2: Write a script to import and use the module
import utilities

# Calculate factorial for numbers 1 to 10
factorials = [utilities.factorial(i) for i in range(1, 11)]

# Print the factorials
print(factorials)
```

```
# Exception Handling in Functions
# Function to divide two numbers with exception handling

def divide_numbers(a, b):
    try:
        # Attempt to divide the numbers
```

```
        result = a / b
    except ZeroDivisionError:
        return "Error: Division by zero is not allowed."
    except TypeError:
        return "Error: Both inputs must be numbers."
    else:
        return result

# Test cases
results = [
    divide_numbers(10, 2),  # Valid division
    divide_numbers(10, 0),  # Division by zero
    divide_numbers(10, 'a')  # Non-numeric input
]

# Print the results
print(results)
```

```
# Using External Modules
# Install and use the NumPy module to sum random numbers between 0 and 10

# Import necessary libraries
import numpy as np

# Generate 10 random numbers between 0 and 10
random_numbers = np.random.uniform(0, 10, 10)

# Calculate the sum of the random numbers
sum_random_numbers = np.sum(random_numbers)

# Print the random numbers and their sum
print("Random Numbers:", random_numbers)
print("Sum of Random Numbers:", sum_random_numbers)
```

```
# Lambda Functions with Filter
# Program to filter out odd numbers from a list ranging from 1 to 10

# List of numbers from 1 to 10
numbers = list(range(1, 11))

# Use filter to get only odd numbers
odd_numbers = list(filter(lambda x: x % 2 != 0, numbers))

# Print the odd numbers
print(odd_numbers)
```

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