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SEG 2105.

ASSIGNMENT 1

5.) **Initialization Testing**:

The objective here is to ensure that when creating a point with specific coordinates, the classes correctly initialize and represent the point according to their respective coordinate systemsConversion Testing:

For PointCP2, testing involves validating the conversion between Polar and Cartesian coordinates, ensuring accuracy.

For PointCP3, the focus is on verifying the conversion between Cartesian and Polar coordinates to ensure accuracy.

Input Validation Testing:This involves testing the classes with a variety of input values, including valid and invalid ones, to ensure the classes handle them appropriately and provide meaningful error messages when necessary.

Sample Testing Scenarios:

1-Initialization Test for PointCP2:

- Input: Creating a PointCP2 object with rho = 3.5 and theta = 1.2.
- Expected Output: The object should initialize correctly, and when displaying the coordinates in both Cartesian and Polar forms, the values should be accurate.

2-Initialization Test for PointCP3:

- Input: Creating a PointCP3 object with x = -2.8 and y = 1.7.
- Expected Output: The object should initialize correctly, and when displaying the coordinates, the values should be accurate.

3-Conversion Test for PointCP2:

- Input: Creating a PointCP2 object with rho = 2.0 and theta = PI.
- Expected Output: The conversion to Cartesian coordinates should yield (x=-2.0, y=0.0).

Discussion of Results:

- Initialization Tests:

  Based on the provided examples, both classes (PointCP2 and PointCP3) seem to initialize correctly.

- Conversion Tests:

  The conversion test for PointCP2 demonstrates accurate conversion from Polar to Cartesian coordinates in the provided scenario.

6.)

Design Aspect	**PointCP2**	**PointCP3**
Coordinate System	Polar coordinates (rho, theta)	Cartesian coordinates (x, y)
Advantages	- Suitable for circular/angular calculations - Compact representation for circular data	-Familiar and intuitive for most users - Directly applicable in many real-world cases
Disadvantages	- Conversion complexity (Polar to Cartesian) - Compact representation for circular data	- Potential complexity for certain operations - Less efficient for circular-related calculations