**Introduction to Programming**

**SADITM** for \_\_Program01: SADITM\_\_

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**Specification of the Problem:**

Write a distance calculator which will read the coordinates for two points. Output the distance between the two points.

**Analysis**: Data Requirements (Include libraries that will need to be imported and primitive data types of all variables)

**Narrative:**

**Prompt** for *x1*. **Read** *x1.* **Prompt** for *y1.* **Read** *y1.* **Prompt** for *x2.* **Read** *x2.* **Prompt** for *y2.* **Read** *y2.* **Compute** *xDistance*. **Compute** *yDistance*. **Compute** *pointDistance.* **Output** *pointDistance.*

**External Files to Include/Import**:

<stdio.h>, <math.h>

**Input variables**:

double *x1*, double *y1*, double *x2*, double *y2*

**Output variables**:

double *pointDistance*

**Program Variables:**

double *xDistance*, double *yDistance*

**Constants**:

N/A

**Formulas:**

*xDistance= x2-x1, yDistance= y2-y1, pointDistance*= sqrt(*xDistance\*xDistance+yDistance\*yDistance)*

**Design**: Algorithm (include Program Variables to store intermediate results, if any)

**Algorithm**:

**Prompt** with “Please enter x1: “

**Read** *x1.*

**Prompt** with “Please enter y1: “

**Read** *y1.*

**Prompt** with “Please enter x2: “

**Read** *x2.*

**Prompt** with“Please enter y2: “

**Read** *y2.*

**Compute** *xDistance = x2-x1*

**Compute** *yDistance = y2-y1*

**Compute** *pointDistance*= sqrt(*xDistance\*xDistance+yDistance\*yDistance)*

**Output** “The distance between your two points is: “*+pointDistance*

**Test Cases**: At least three test cases

Nominal Cases

*x1 =* 5  *y1 =* 2  *x2 =* 1 *y2 =* 4 (positive integer case)

The distance between your two points is: 4.4721

*x1* = 3.1  *y1* = 4.29 *x2* = 9.34 *y2* = 1.72 (positive float case)

The distance between your two points is: 6.7485

*x1* = -2 *y1* = -9  *x2* = -27 *y2* = -6 (negative integer case)

The distance between your two points is: 29.1548

*x1* = -2.57 *y1* = -4.47 *x2* = -94.5 *y2* = -71.8 (negative float case)

The distance between your points is: 113.9493

*x1* = -222.57 *y1* = 43.6 *x2* = 56.6 *y2* = -76.0 (positive and negative float case)

The distance between your points is: 15.8825

*x1* = 2 *y1* = -56 *x2* = -98 *y2* = 32 (positive and negative integer case)

The distance between your points is: 133.2066

*x1* = 0 *y1* = 0 *x2* = 0 *y2* = 0 (zero case)

The distance between your points is: 0

*x1* = 0  *y1* = 49 *x2* = 35.6 y2 = -98 (mixed zero case)

The distance between your points is: 151.2493