**OBJECT ORIENTED PROGRAMMING 1 LABORATORY**
**Experiment # 3:**
**Introduction to Classes and Objects**

## OBJECTIVES

The main purpose of this experiment is to introduce you to classes and objects. In this experiment, a simple example is studied. Then, students will document your code with Doxygen.

## QUESTIONS

Write a C++ program to implement the CCS Class.

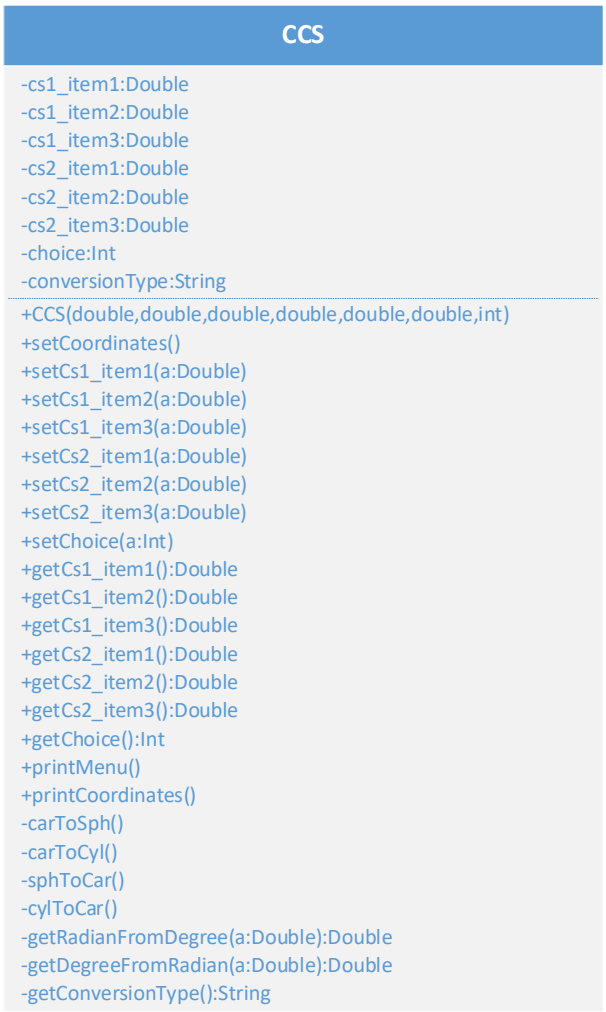


**Fig 1.** UML Class Diagram for CCS Class

i) In constructor, initialize double and int data members. **In constructor, use set functions.**

ii) In printMenu function, print a menu for choosing conversation type. **If the user selects an invalid selection, show the menu with a warning message. This process must continue until the user enters a valid selection.**

iii) In setCoordinates function, prompt the coordinates **according to selection of the user.** Then, set the values to cs1_item1, cs1_item2, and cs1_item3 with **set functions**. If the user selects Exit option, print a closing message.

iv) In printCoordinates function, call the appropriate function to perform conversion. Then, print the result according to the given examples. **Notice that, angles must be shown in terms of degree.**

v) carToSph function converts Cartesian corrdinates to spherical coordinates.

vi) carToCyl function converts Cartesian corrdinates to cylindrical coordinates.

vii) sphToCar function converts spherical coordinates to Cartesian corrdinates.

viii) cylToCar function converts cylindrical coordinates to Cartesian corrdinates.

Test your program with the following driver program.

```
int main(int argc, char** argv) {

    CCS myCCS(0.0,0.0,0.0,0.0,0.0,0.0,0);
    myCCS.printMenu();
    myCCS.setCoordinates();
    myCCS.printCoordinates();

    return 0;
}
```

Outputs for program

```
**********************************************************
1. Cartesian to Spherical
2. Cartesian to Cylindrical
3. Spherical to Cartesian
4. Cylindrical to Cartesian
5. Exit
**********************************************************
Enter your choice
4
Enter rho, phi, and z coordinates
4 120 -2
P(4,120,-2)=====Cylindrical to Cartesian========> PCON(-2,3.4641,-2)
```

```
**********************************************************
1. Cartesian to Spherical
2. Cartesian to Cylindrical
3. Spherical to Cartesian
4. Cylindrical to Cartesian
5. Exit
**********************************************************
Enter your choice
2
Enter x, y, and z coordinates
1 -3 5
P(1,-3,5)=====Cartesian to Cylindrical========> PCON(3.16228,-71.5651,5)
```

# Document your code with Doxygen program.