OBJECT ORIENTED PROGRAMMING
SECTION – C [WEDNESDAY SEPTEMBER 01, 2021: 2:00 PM – 5:00 PM]

ASSIGNMENTS – 03 (RP03)   CODE: ASSIGN03

NOTES:
  i)   Create files with the following file naming conventions: If your roll number ends with **ABC**,
       year of admission is 20YY and assignment code is **AssignNN** then, use the file name as
       follows: AssignNN20YYABC.java (use appropriate extension .java).

       For example, if the roll number ends with 172; year of admission is 2019 & the assignment
       code is Assign03, then the file name should be **Assign032019172.java**

  ii) Strictly follow the file naming convention. Otherwise, it would attract a penalty upto 20%.

PROBLEMS   [Total Marks: 20]
Note: Use random number generator to generate inputs wherever needed.
The following problem has to be solved using JAVA. File name must end with .java extension

1) **[Marks: 20]**
   Define a Circle with Center C(x,y) (assume this as a Center with two members: x and y) and
   radius r. The center C(x, y) of each Circle should fall in between (0.0, 0.0) and (10.0, 10.0) and
   radius ranges in [1.0, 3.0]. Randomly generate values for the attributes of each Circle.

   Now do the following tasks:

   a) [2 marks] Define a class Circle with the given attributes: Center (x, y) and radius r and
       write the default constructor for Circle
       [Hint: You may use Circle[] c = new Circle[10]; for creating an array of 10 circles]

   b) [2 marks] Write the following parameterized constructors to create a set of n Circles:

                     public Circle(Center c, float radius);
                     public Circle(int x, int y, float radius);

   c) [2 marks] Write methods to print the details (center and radius) of a given Circle:
                             void printDetails();
                         void printDetails(Circle circle);

   d) [2 marks] Write a method to identify and print the details (center and radius) of each of n
       Circles only if the center of the circle lies in between the given interval [min, max]:

               void findCircles(Circle circle, int min, int max);
           void findCircles(Circle circle, Center mincoord, Center maxcoord);

   e) [12 marks] Write a method to identify and print the details (center and radius) ALL pairs
       of a) overlapping, b) touching and c) concentric Circles among n Circles:

                     void findOTCCircles(Circle circle, int n);