using System;

using System.Collections.Generic;

public abstract class Shape

{

public abstract bool ContainsPoint(double x, double y);

}

public class Rectangle : Shape

{

public double CenterX { get; }

public double CenterY { get; }

public double Width { get; }

public double Height { get; }

public Rectangle(double centerX, double centerY, double width, double height)

{

CenterX = centerX;

CenterY = centerY;

Width = width;

Height = height;

}

public override bool ContainsPoint(double x, double y)

{

return x >= CenterX - Width / 2 && x <= CenterX + Width / 2 &&

y >= CenterY - Height / 2 && y <= CenterY + Height / 2;

}

}

public class Circle : Shape

{

public double CenterX { get; }

public double CenterY { get; }

public double Radius { get; }

public Circle(double centerX, double centerY, double radius)

{

CenterX = centerX;

CenterY = centerY;

Radius = radius;

}

public override bool ContainsPoint(double x, double y)

{

double dx = x - CenterX;

double dy = y - CenterY;

return (dx \* dx + dy \* dy) <= (Radius \* Radius);

}

}

public class ShapeCollection

{

private List<Shape> shapes = new List<Shape>();

public void AddShape(Shape shape)

{

shapes.Add(shape);

}

public bool ContainsPoint(double x, double y)

{

foreach (var shape in shapes)

{

if (shape.ContainsPoint(x, y))

{

return true;

}

}

return false;

}

}

class Program

{

static void Main(string[] args)

{

ShapeCollection shapeCollection = new ShapeCollection();

bool running = true;

while (running)

{

Console.WriteLine("1. Добавить прямоугольник");

Console.WriteLine("2. Добавить круг");

Console.WriteLine("3. Проверить принадлежность точки");

Console.WriteLine("0. Выход");

Console.Write("Выберите опцию: ");

string option = Console.ReadLine();

switch (option)

{

case "1":

AddRectangle(shapeCollection);

break;

case "2":

AddCircle(shapeCollection);

break;

case "3":

CheckPoint(shapeCollection);

break;

case "0":

running = false;

break;

default:

Console.WriteLine("Неверный выбор. Попробуйте снова.");

break;

}

}

}

private static void AddRectangle(ShapeCollection shapeCollection)

{

Console.Write("Введите координаты центра (X, Y): ");

var center = Console.ReadLine().Split(',');

double centerX = double.Parse(center[0]);

double centerY = double.Parse(center[1]);

Console.Write("Введите ширину и высоту (Width, Height): ");

var dimensions = Console.ReadLine().Split(',');

double width = double.Parse(dimensions[0]);

double height = double.Parse(dimensions[1]);

shapeCollection.AddShape(new Rectangle(centerX, centerY, width, height));

Console.WriteLine("Прямоугольник добавлен.");

}

private static void AddCircle(ShapeCollection shapeCollection)

{

Console.Write("Введите координаты центра (X, Y): ");

var center = Console.ReadLine().Split(',');

double centerX = double.Parse(center[0]);

double centerY = double.Parse(center[1]);

Console.Write("Введите радиус: ");

double radius = double.Parse(Console.ReadLine());

shapeCollection.AddShape(new Circle(centerX, centerY, radius));

Console.WriteLine("Круг добавлен.");

}

private static void CheckPoint(ShapeCollection shapeCollection)

{

Console.Write("Введите координаты точки (X, Y): ");

var point = Console.ReadLine().Split(',');

double pointX = double.Parse(point[0]);

double pointY = double.Parse(point[1]);

bool isContained = shapeCollection.ContainsPoint(pointX, pointY);

Console.WriteLine(isContained ? "Точка принадлежит множеству." : "Точка не принадлежит множеству.");

}

}