

**Information and Computer Science Department**

**Spring Semester 152**

**ICS 102 – Introduction to Computing I**

**Midterm Exam Solution**

**Saturday, March 05, 2016**

**Duration: 120 minutes**

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| **Name:** |  |

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| **Instructor:** |  |

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| **Question #** | **Row Score** | **Weight** | **Score** |
| **1** |  | 9 |  |
| **2** |  | 7 |  |
| **3** |  | 7 |  |
| **4** |  | 7 |  |
| **Total** |  | 30 |  |

**Question # 1**

What is the output of the following code fragments?

| **Code Fragment** | **Output** |
| --- | --- |
| System.out.println(10 + 20 / 2); | 20 |
| System.out.println(89 / 10); | 8 |
| System.out.println(89 % 10); | 9 |
| System.out.println((double)89 / 10); | 8.9 |
| System.out.println((double)(89 / 10)); | 8.0 |
| String s = "ICS102";String r = s.substring(3) + s.substring(0,3);System.out.println(r); | 102ICS |
| String s = "ICS102";System.out.println(s.indexOf("CI")); | -1 |
| int x = 10;if (x > 1) x = x + 10;if (x > 15) x = x + 5;System.out.println(x); | 25 |
| int x = 10;if (x > 1) x = x + 10;else if (x > 15) x = x + 5;System.out.println(x); | 20 |
| int s = 0;for (int x = 1; x <= 100; x++) s += 5;System.out.println(s); | 500 |

**Question # 2**

Write a program that takes the x – y coordinates of a point in the Cartesian plane and prints a message telling either an axis on which the point lies or the quadrant in which it is found.

|  |  |
| --- | --- |
| Sample lines of output:(-1.0, -2.5) is in quadrant III(0.0, 4.8) is on the y-axis |  |

import java.util.Scanner;

public class MidtermQ2

{

 public static void main(String[] args)

 {

 Scanner kb = new Scanner(System.in);

 System.out.println("Enter x - y coordinates of a point:");

 double x = kb.nextDouble();

 double y = kb.nextDouble();

 System.out.print("(" + x + "," + y + ") ");

 if(x == 0)

 if(y == 0)

 System.out.println(" is origin");

 else

 System.out.println(" is on y-axis");

 else if(y == 0)

 System.out.println(" is on x-axis");

 else if(x > 0)

 if( y > 0)

 System.out.println(" is in quadrant I");

 else

 System.out.println(" is in quadrant IV");

 else

 if( y > 0)

 System.out.println(" is in quadrant II");

 else

 System.out.println(" is in quadrant III");

 }

}**Question # 3**

Write a program that reads a string str and an int n, then outputs a string where the char at index n has been removed. Assume that n is a valid index (n is in the range 0..str.length()-1 inclusive).

("kfupm", 1) --> "kupm"

("kfupm", 0) --> "fupm"

("kfupm", 4) --> "kfup"

import java.util.Scanner;

public class MidtermQ3

{

 public static void main(String[] args)

 {

 Scanner kb = new Scanner(System.in);

 System.out.println("Enter string");

 String str = kb.nextLine();

 System.out.println("Enter an int n");

 int n = kb.nextInt();

 String newstr = str.substring(0, n) + str.substring(n+1);

 System.out.println("str = " + str);

 System.out.println("newstr = " + newstr);

 }

}

**Question # 4 [8 points]**

The value for π can be determined by the series equation

$$π=4×\left(1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\frac{1}{13}- \cdots \right)$$

Write a program to approximate the value of π using the formula given including terms up through 1/99.

public class MidtermQ4

{

 public static void main(String[] args)

 {

 double sum = 0;

 double sign = 1;

 for(int x = 1; x <= 99; x+= 2)

 {

 sum += sign / x;

 sign = -sign;

 }

/\* for(int x = 1; x <= 99; x+= 4)

 sum += 1.0 / x;

 for(int x = 3; x <= 99; x+= 4)

 sum -= 1.0 / x;

 \*/ sum \*= 4;

 System.out.println("pi = "+ sum);

 }

}