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**CSC 313 EXERCISES**

1. WRITE A JAVA PROGRAM TO PRINT OUT THE FLAG OF NIGERIA AS SHOWN IN THIS SLIDE (IGNORE THE WHITE BACKGROUND). TO DO THIS, a.USE A SINGLE LOOP

public class NigerianFlag {

public static void main(String[] args) {

for (int i = 1; i <= 12; i++) {

if (i <= 4) {

System.out.println("\*\* \*\*");

} else if (i <= 8) {

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

} else {

System.out.println("\*\* \*\*");

}

}

}

}b.USE A NESTED LOOP

public class NigerianFlagNested {

public static void main(String[] args) {

for (int i = 1; i <= 12; i++) {

if (i <= 4 || i > 8) {

for (int j = 1; j <= 12; j++) {

if (j <= 2 || j > 10) {

System.out.print("\*");

} else {

System.out.print(" ");

}

}

} else {

for (int j = 1; j <= 12; j++) {

System.out.print("=");

}

}

System.out.println();

}

}

}

2.WRITE A JAVA PROGRAM TO PRINT OUT THE FLAG OF NIGERIA AS SHOWN IN THIS SLIDE (IGNORE THE WHITE BACKGROUND). TO DO THIS, USE A SINGLE LOOP

public class NigerianFlagSingleLoop {

public static void main(String[] args) {

String[] lines = {

"\*\*\*\* ========",

"\*\*\*\* ========",

"\*\*\*\* ========",

"==== ========",

"==== ========"

};

for (int i = 0; i < lines.length; i++) {

System.out.println(lines[i]);

}

}

}USE A NESTED LOOP

public class NigerianFlagNestedLoops {

public static void main(String[] args) {

for (int i = 1; i <= 5; i++) {

for (int j = 1; j <= 12; j++) {

if (j <= 4) {

System.out.print("\*");

} else if (j <= 6) {

System.out.print(" ");

} else {

System.out.print("=");

}

}

System.out.println();

}

}

}

QUESTION THREE (3)

CONSIDER AN ARRAY THAT HAS THE DATA SHOWN BELOW. WRITE A JAVA PROGRAM TO DO THE FOLLOWING:

a. THE MEAN. MEAN = SUM OF ALL ELEMENTS/NUMBER OF ELEMENTS.

b. PRINT OUT THE MEDIAN. MEDIAN = ELEMENT AT THE MIDDLE.

c. THE STANDARD DEVIATION =

\sqrt{\frac{\sum (x\_i - \mu)^2}{N}}

a. IS THE SIZE OF THE POPULATION,

b. IS THE POPULATION MEAN,

WHERE N , IS EACH VALUE FROM THE POPULATION.

Array:

2, 5, 5, 9, 4, 7, 0, 9, 6, 11, 12

import java.util.Arrays;

public class ArrayStatistics {

public static void main(String[] args) {

// Given data

int[] data = {2, 5, 5, 9, 4, 7, 0, 9, 6, 11, 12};

// Calculate mean

double mean = calculateMean(data);

System.out.println("Mean: " + mean);

// Calculate median

double median = calculateMedian(data);

System.out.println("Median: " + median);

// Calculate standard deviation

double standardDeviation = calculateStandardDeviation(data, mean);

System.out.println("Standard Deviation: " + standardDeviation);

}

// Method to calculate the mean

public static double calculateMean(int[] data) {

double sum = 0;

for (int value : data) {

sum += value;

}

return sum / data.length;

}

// Method to calculate the median

public static double calculateMedian(int[] data) {

Arrays.sort(data); // Sort the array

int n = data.length;

if (n % 2 == 0) {

return (data[n / 2 - 1] + data[n / 2]) / 2.0; // Average of middle elements

} else {

return data[n / 2]; // Middle element

}

}

// Method to calculate the standard deviation

public static double calculateStandardDeviation(int[] data, double mean) {

double sumSquaredDifferences = 0;

for (int value : data) {

sumSquaredDifferences += Math.pow(value - mean, 2);

}

return Math.sqrt(sumSquaredDifferences / data.length); // Population standard deviation

}

}

QUESTION FOUR (4)

DECLARE AN ARRAY OF LENGTH 10.

A. WRITE A PROGRAM USING A LOOP TO ASSIGN ELEMENTS TO THE ARRAY BY ACCEPTING INPUT FROM THE USER. MAKE SURE TO STATE THE INDEX THAT THE USER'S INPUT WILL BE TO THE USER BEFORE ACCEPTING THE INPUT.

B. USING A FOR-EACH LOOP, PRINT OUT THE INPUT ENTERED BY THE USER.

import java.util.Scanner;

public class ArrayInput {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Declare an array of length 10

int[] numbers = new int[10];

// Assign elements to the array by accepting input from the user

for (int i = 0; i < numbers.length; i++) {

System.out.print("Enter a number for index " + i + ": ");

numbers[i] = scanner.nextInt();

}

// Print the elements of the array using a for-each loop

System.out.println("The numbers you entered are:");

for (int number : numbers) {

System.out.print(number + " ");

}

}

}

QUESTION FIVE (5)

DECLARE A 2D ARRAY OF SIZE 10 BY 10.

A. WRITE A PROGRAM USING A LOOP TO ASSIGN ELEMENTS TO THE

ARRAY BY ACCEPTING INPUT FROM THE USER. MAKE SURE TO

STATE THE INDEX THAT THE USER'S INPUT WILL BE TO THE USER

BEFORE ACCEPTING THE INPUT.

B. USING A FOR EACH LOOP, PRINT OUT THE INPUT ENTERED BY THE

USER.

import java.util.Scanner;

public class TwoDimensionalArray {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Declare a 2D array of size 10 by 10

int[][] numbers = new int[10][10];

// Assign elements to the array by accepting input from the user

for (int i = 0; i < numbers.length; i++) {

for (int j = 0; j < numbers[i].length; j++) {

System.out.print("Enter a number for index [" + i + "][" + j + "]: ");

numbers[i][j] = scanner.nextInt();

}

}

// Print the elements of the array using a for-each loop

System.out.println("The numbers you entered are:");

for (int[] row : numbers) {

for (int number : row) {

System.out.print(number + " ");

}

System.out.println();

}

}

}