CSE18R272-LAB MANUAL

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

COMPUTER SCIENCE AND EDUCATION

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Section: A5

Course name: Java Programming

Course Code: CSE18R272

**1. Find mean and standard deviation.**

**Program:**

import java.util.Scanner;

import java.lang.\*;

public class Main {

public static void main(String[] args){

int Array[];

System.out.println("enter the elements of array; ");

int s = 0,i=0;

float main = 0,sd;

Scanner sc=new Scanner(System.in);

int n = sc.nextInt();

Array = new int[5];

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

Array[i]=sc.nextInt();

s=s+Array[i];

}

float sum=0;

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

float dist = Array[i]-main;

sum+=dist\*dist;

}

sd= (float) Math.sqrt((sum/5));

main = s/5;

System.out.println(main);

System.out.println(sd);

}

}

**2. Find the nCr and nPr.**

**Program:**

import java.util.Scanner;

public class Main {

public static int factorial(int n)

{

int fact=1, i;

for(i=1; i<=n; i++)

{

fact = fact\*i;

}

return fact;

}

public static void main(String args[])

{

int n, r;

Scanner scan = new Scanner(System.in);

System.out.print("Enter Value of n : ");

n = scan.nextInt();

System.out.print("Enter Value of r : ");

r = scan.nextInt();

int ncr= (factorial(n)/(factorial(n-r)\*factorial(r)));

int npr= (factorial(n)/(factorial(n-r)));

System.out.print("NCR = "+ncr);

System.out.print("\nNPR = " +npr);

}

}

**3. Print all prime numbers in the given range.**

**Program:**

import java.util.Scanner;

public class Main {

static void isprime(int n){

int i= 0;

for(i=2;i<=n/2;i++){

if(n%i==0){

System.out.println(n+"is not a prime number");

break;

}

else{

System.out.println(n+"is a prime number");

break;

}

}

}

public static void main(String[] args){

Main p = new Main ();

Scanner in = new Scanner(System.in);

System.out.println("enter the number:");

int n;

n = in.nextInt();

p.isprime(n);

}

**4. Find sum of the digits.**

**Program:**

import java.util.Scanner;

public class Main {

static int sum(int n){

int s=0;

while(n!=0){

s+=n%10;

n=n/10;

}

return s;

}

public static void main(String[] args){

Main sol = new Main();

Scanner in = new Scanner(System.in);

System.out.println("enter the number:");

int n;

n = in.nextInt();

int su = sol.sum(n);

System.out.println(su);

}

}

**5. Check whether a given number is palindrome or not.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String[] args){

Scanner sc=new Scanner(System.in);

System.out.print("Enter the number to check : ");

int number = sc.nextInt();

int a,s=0;

int n=number;

while(number!=0){

a=number%10;

s=s\*10+a;

number=number/10;

}

if(s==n){

System.out.println("palindrome number ");

}

else{

System.out.println("not palindrome");

}

}

}

**6. Check whether a given number is prime factor or not.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String args[]){

int number;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number ::");

number = sc.nextInt();

for(int i = 2; i< number; i++) {

while(number%i == 0) {

System.out.println(i+" ");

number = number/i;

}

}

if(number >2) {

System.out.println(number);

}

}

}

**7. Check whether a given number is perfect number or not.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String[] args){

int n,sum =0;

Scanner s = new Scanner(System.in);

System.out.print("Enter any integer : ");

n = s.nextInt();

for(int i = 1; i < n; i++)

{

if(n % i == 0)

{

sum = sum + i;

}

}

if(sum == n)

{

System.out.println("Given number is Perfect");

}

else

{

System.out.println("Given number is not Perfect");

}

}

}

**8. Check whether a given number is deficient number or not.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String[] args){

int n,sum =0;

Scanner s = new Scanner(System.in);

System.out.print("Enter any integer : ");

n = s.nextInt();

for(int i = 1; i < n; i++)

{

if(n % i == 0)

{

sum = sum + i;

}

}

if(sum < n)

{

System.out.println("Given number is Deficient");

}

else

{

System.out.println("Given number is not Deficient");

}

}

}

**9. Apply any one of the sorting algorithm.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String[] args){

int arr[];

System.out.println("enter the elements of array; ");

int s = 0,i=0;

arr = new int[5];

Scanner sc=new Scanner(System.in);

for(i=0;i<5;i++){

arr[i]=sc.nextInt();

}

int n = arr.length;

for ( i = 0; i < n-1; i++){

for (int j = 0; j < n-i-1; j++){

if (arr[j] > arr[j+1])

{

int temp = arr[j];

arr[j] = arr[j+1];

arr[j+1] = temp;

}

}

}

for (i=0; i<n; ++i){

System.out.print(arr[i] + " ");

System.out.println();

}

}

}

**10. Number conversion from decimal to binary.**

**Program:**

import java.util.Scanner;

public class Main {

public static void main(String[] args){

int Array[];

Array= new int[100];

Scanner sc=new Scanner(System.in);

System.out.println("Enter the decimal value : ");

int n = sc.nextInt();

int i=0;

while(n>0){

Array[i]=n%2;

n=n/2;

i++;

}

for(int j=i-1;j>=0;j--){

System.out.print(Array[j]);

}

}

}

**11. Write a program to complete and exp(e)**

**exp(e)= 1 + x/1! + x^2/2! + x^3/3! + ......**

**Program:**

import java.util.Scanner;

public class Main {

static float exponential(int n, float x)

{

float sum = 1;

for (int i = n - 1; i > 0; --i )

sum = 1 + x \* sum / i;

return sum;

}

public static void main (String[] args)

{

System.out.print("Enter Starting Number : ");

Scanner sc=new Scanner(System.in);

int n = sc.nextInt();

float x = 1;

System.out.println("e^x = "+exponential(n,x));

}

}

**12. Program to compute row sum, column sum and trace of a matrix**

**Program:**

import java.io.\*;

class Main {

static int m = 7;

static int n = 5;

static void row\_sum(int arr[][])

{

int i,j,sum = 0;

System.out.print( "\nFinding Sum of each row:\n\n");

for (i = 0; i < 4; ++i) {

for (j = 0; j < 4; ++j) {

sum = sum + arr[i][j];

}

System.out.println( "Sum of the row "

+ i + " = " + sum);

sum = 0;

}

}

static void column\_sum(int arr[][])

{

int i,j,sum = 0;

System.out.print( "\nFinding Sum of each column:\n\n");

for (i = 0; i < 4; ++i) {

for (j = 0; j < 4; ++j) {

sum = sum + arr[j][i];

}

System.out.println(

"Sum of the column "

+ i + " = " + sum);

sum = 0;

}

}

public static void main (String[] args) {

int i,j;

int [][]arr = new int[m][n];

int x = 1;

for (i = 0; i < m; i++)

for (j = 0; j < n; j++)

arr[i][j] = x++;

row\_sum(arr);

column\_sum(arr);

}

}

**13. Write a program to encrypt a code in Caesar's code**

**Program:**

class Main{

String plain;

int key;

public Main(String text,int k){

plain=text;

key=k;

}

String encrypt(){

String out="";char ch;

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

if(Character.isUpperCase(plain.charAt(i)))

ch=(char)(((int)plain.charAt(i)-65+key)%26+65);

else

ch=(char)(((int)plain.charAt(i)-97+key)%26+97);

out+=ch;

}

return out;

}

public static void main(String[] args) {

Main c = new Main("Adithya", 7);

String out = c.encrypt();

System.out.println(out);

}

}

**14. Write a program Java Program to implement the Mono alphabetic Cipher.**

**program:**

class Main

{

static String encoder(char[] key)

{

String encoded = "";

boolean[] arr = new boolean[26];

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

{

if (key[i] >= 'A' && key[i] <= 'Z')

{

if (arr[key[i] - 65] == false)

{

encoded += (char) key[i];

arr[key[i] - 65] = true;

}

}

else if (key[i] >= 'a' && key[i] <= 'z')

{

if (arr[key[i] - 97] == false)

{

encoded += (char) (key[i] - 32);

arr[key[i] - 97] = true;

}

}

}

for (int i = 0; i < 26; i++)

{

if (arr[i] == false)

{

arr[i] = true;

encoded += (char) (i + 65);

}

}

return encoded;

}

static String cipheredIt(String msg, String encoded)

{

String cipher = "";

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

{

if (msg.charAt(i) >= 'a' && msg.charAt(i) <= 'z')

{

int pos = msg.charAt(i) - 97;

cipher += encoded.charAt(pos);

}

else if (msg.charAt(i) >= 'A' && msg.charAt(i) <= 'Z')

{

int pos = msg.charAt(i) - 65;

cipher += encoded.charAt(pos);

}

else

{

cipher += msg.charAt(i);

}

}

return cipher;

}

public static void main(String[] args)

{

String key;

key = "Adithya";

System.out.println("Keyword : " + key);

String encoded = encoder(key.toCharArray());

String message = "Adithya";

System.out.println("Message before Ciphering : " + message);

System.out.println("Ciphered Text : " + cipheredIt(message,

encoded));

}

}

**15. Write a program Java Program to implement simple Encryption Decryption with Modulo 26**

**Program:**

class Main {

String plain;

public Main(String text){

plain = text;

}

String encrypt() {

String out="";

String alpha="abcdefghijklmnopqrstuvwxyz";

String sub="kdgfnslvbwahexjmqcpzrtyiuo";

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

{

int key = 0;

char ch = (char) (( (int) plain.charAt(1) - 97 +key )% 26 +97);

out = out + ch;

} return out;

}

public static void main(String[] args)

{

Main c = new Main("Adithya");

String out = c.encrypt();

System.out.println(out);

}

}

**16. Write a program Java Program for XOR Cipher.**

**Program:**

class Main {

String plain;

char key;

public Main (String text,char k){

plain=text;

key=k;

}

String encrypt(){

String out="";char ch;

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

ch=(char)((int)plain.charAt(i)^(int)key);

out+=ch;

}

return out;

}

public static void main(String[] args) {

Main c = new Main("Adithya", 'A');

String out = c.encrypt();

System.out.println(out);

}

}

**17. Write a program Java Program for Latin alphabet cipher.**

**Program:**

class Main{

String plain;

Main (String text)

{

plain =text;

}

String encrypt()

{

String alpha="abcdefghijklmnopqrstuvwxyz";

String out="";

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

{

char ch=plain.charAt(i);

int p=alpha.indexOf(ch)+1;

out =out+p+" ";

}

return out;

}

public static void main(String[] args) {

Main c=new Main("Adithya");

String out=c.encrypt();

System.out.println(" encryption : "+out);

}

}

**18. Write a program called Harmonic Sum to compute the sum of a harmonic series, as**

**shown below, where n=50000. The program shall compute the sum from left-to-right as**

**well as from the right-to-left. Are the two sums the same? Obtain the absolute difference**

**between these two sums and explain the difference. Which sum is more accurate?**

**Program :**

public class Main {

public static void main(String args[]){

int harmonic = 70000;

double L2R=0, R2L=0;

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

L2R += (double)(1)/i;

R2L += (double)(1)/(harmonic-i+1);

}

double difference = R2L-L2R;

System.out.println("left to right = " + L2R);

System.out.println("right to left = " + R2L);

System.out.println("difference is " + difference);

}

}

**19. Write a program which prompts user for the number of students in a class (a non-**

**negative integer), and saves it in an int variable called num Students. It then prompts user**

**for the grade of each of the students (integer between 0 to 100) and saves them in an int**

**array called grades. The program shall then compute and print the average (in double**

**rounded to 2 decimal places) and minimum/maximum (in int).**

**Program:**

import java.util.Scanner;

public class Main {

private final int LOWEST\_GRADE = 0;

private final int HIGHEST\_GRADE = 100;

private int[] grades;

private Scanner in;

public static void main(String[] args)

{

Main aGradesAverage = new Main();

aGradesAverage.in = new Scanner(System.in);

System.out.print("Enter the number of students: ");

int numStudents = aGradesAverage.in.nextInt();

aGradesAverage.run(numStudents);

}

private void run(int numStudents)

{

if (numStudents <= 0) {

System.out.println("Invalid number of students.");

return;

}

grades = new int[numStudents];

double sum = 0;

int i = 0;

while (i < numStudents)

{

System.out.printf("Enter the grade for student %1$d: ", (i+1));

int grade = in.nextInt();

if ((grade >= LOWEST\_GRADE) && (grade <= HIGHEST\_GRADE)) {

grades[i] = grade;

sum += grade;

i++;

continue;

}

System.out.println("Invalid grade, try again...");

}

System.out.printf("The average is %1$.2f\n", (sum / numStudents));

}

}

**20. Write a Java program to separate 0s on left side and 1s on right side of an array of 0s and is in random order.**

**Program:**

import java.util.Arrays;

import java.util.Scanner;

public class Main {

public static void main(String[] args)

{

int arr[] = new int[9];

int result[];

System.out.println("Original Array ");

System.out.println(Arrays.toString(arr));

Scanner sc = new Scanner(System.in);

System.out.println("Enter the elements of the array: ");

for(int i=0; i<8; i++)

{

arr[i]=sc.nextInt();

}

int n = arr.length;

result = separate\_arr(arr, n);

System.out.println("New Array ");

System.out.println(Arrays.toString(result));

}

static int [] separate\_arr(int arr[], int n)

{

int count = 0;

for (int i = 0; i < n; i++) {

if (arr[i] == 0)

count++;

}

for (int i = 0; i < count; i++)

arr[i] = 0;

for (int i = count; i < n; i++)

arr[i] = 1;

return arr;

}

}

**21. Write a Java program to add and remove a specific element from an array.**

**Program:**

import java.util.Scanner;

public class Delete

{

public static void main(String[] args)

{

int n, x, flag = 1, loc = 0;

Scanner s = new Scanner(System.in);

System.out.print("Enter no. of elements you want in array:");

n = s.nextInt();

int a[] = new int[n];

System.out.println("Enter all the elements:");

for (int i = 0; i < n; i++)

{

a[i] = s.nextInt();

}

System.out.print("Enter the element you want to delete:");

x = s.nextInt();

for (int i = 0; i < n; i++)

{

if(a[i] == x)

{

flag =1;

loc = i;

break;

}

else

{

flag = 0;

}

}

if(flag == 1)

{

for(int i = loc+1; i < n; i++)

{

a[i-1] = a[i];

}

System.out.print("After Deleting:");

for (int i = 0; i < n-2; i++)

{

System.out.print(a[i]+",");

}

System.out.print(a[n-2]);

}

else

{

System.out.println("Element not found");

}

}

}

**22. Write a program called CozaLozaWoza which prints the numbers 1 to 110, 11 numbers**

**per line. The program shall print "Coza" in place of the numbers which are multiples of 3,**

**"Loza" for multiples of 5, "Woza" for multiples of 7, "CozaLoza" for multiples of 3 and 5,**

**and so on. The output shall looklike:**

**1 2 Coza 4 Loza Coza Woza 8 Coza Loza 11**

**Coza 13 Woza CozaLoza 16 17 Coza 19 Loza CozaWoza 22**

**23 Coza Loza 26 Coza Woza 29 CozaLoza 31 32 Coza**

**Program:**

public class Main {

public static void main(String args[]) {

int i = 1;

while (i <= 110) {

boolean test = false;

if (i % 3 == 0) {

System.out.print("coza");

test = true;

}

if (i % 5 == 0) {

System.out.print("loza");

test = true;

}

if (i % 7 == 0) {

System.out.print("woza");

test = true;

}

if (!test) {

System.out.print(i);

}

System.out.print(" ");

if (i % 11 == 0) {

System.out.println();

}

i++;

}

}

}