Structured Programming Methodology

Practical Assignment

Division B

1. Write an algorithm and Design a flowchart for calculating the profit and loss according to the value entered by the user.(Hint : Cost and Income)

2. Write an algorithm and draw the flowchart to find greater of 4 numbers

3. Write an algorithm and draw a flowchart to interchange 2 numbers(swap 2 numbers)

4. Write a java program to find the number is greater , lesser or equal to between 2 numbers

5. Write a java program to find average of 3 numbers

6. Write a java program to find simple interest

7. Write a java program to find area of circle

8. Write a java program to find area of triangle

9. Write a java program to find whether the given year is leap year or not

10. Write a java program to Convert Temperature Celsius into Fahrenheit

11. Write a java program to find whether the given number is divisible by 2 or not.

12. Write a java program to find percentage of given student (input marks of 3 subjects, find total , percentage)

13. Write a java program to find the entered age of child belongs to childhood, adolescence and young age(0-11 childhood,12 -17 adolescence and18 onwards young age)

14. Write a program that reads a number in meters, converts it to feet, and displays the result. Formula: feet = meter * 3.28084

15. Write a java program to calculate Net Salary. **<u>User has to input basic salary</u>** and Output as follows:

Example

Enter Basic salary:5000

Allowances:

  DA=90% of Basic salary

  HRA=10% of Basic salary

  MA=5% of Basic salary

  TA=400

Deduction:

  PF=12% of Basic salary

  IT =user input

Netsalary=Basic salary+Allowances-Deduction

16. **Write a program in java to display the first 10 natural numbers. (Date: 04/12/21)**

17. **Write a program in java to display the first 10 natural numbers in reverse order. (Date: 04/12/21)**

18. **Write a java program to find the sum of first 10 natural numbers (Date: 04/12/21)**

19. **Write a program in java to display the multiplication table of a given integer. (Date: 04/12/21)**

Structured Programming Methodology

Practical Assignment

Aim: Strings and Loops in java

Date: 16/12/21

Basic:

1. Write a java program to input sentence from user.
   a. Print each character of the paragraph and also print length of the paragraph.
   b. Convert the paragraph into upper case/lowercase.

c. Print the paragraph in reverse order.

d. Remove spaces from beginning and end of the string.

Moderate

2. Write a java program to print and count vowels and consonants from given string.

Example

Inputted String: This is java lecture

O/p vowels :- i   i a a   e   u   e   Total 7

Consonants:- T h s   s j v l c t r   Total 10

3. Write a java program to find the frequency of a character in a string.

Example :

Inputted string: Java is interesting subject

Inputted char: a

O/p   The frequency of character is 2 i.e at 1st and 3rd position

General Practice Assignment

Date: 23/12/21

1. Write a java program to print multiplication of two numbers as following example. If input numbers are 25 and 15 output should be as following.

```
  2 5
X 1 5
_____
  2 5 0
+ 1 2 5
--------------------
  3   7   5
```

2. Write a java program to check whether given character is vowel or not.

3. Write a java program to replace the given characters with '*'

Example

Input String : This is java session

Input Search char : i

Replaced ouput Th*s *s java sess*on

General Practice Assignment

Date:30/12/21

1.Write a java program to find whether the given number is not divisible by 2, 3, 5**(Aim: if statement)**

2. Write a java program to check if string is palindrome or not.**(Aim: Strings in Java)**

Example 1

Step 1: Inputted String: Hello

Step 2: Perform reverse on the string

olleH

Step 3: Compare Inputted string and reverse

Hello and olleH are not same

Step 4: Display "String is not palindrome"

Example 2

Step 1: Inputted String: AbA

Step 2: Perform reverse on the string

AbA

Step 3: Compare Inputted string and reverse

AbA and AbA are same

Step 4: Display "String is palindrome"

Practical Assignment

Date:30/12/21

Aim: Loops

Level:Basic

1. **Write a java Program to print the sum and average of the inputted number**

    Example : no = 4567

    Then sum of the no = 4+5+6+7 = 22

    Example : no =1234

    Sum of the no =1+2+3+4=10

Level : Moderate

2. **Write a java Program to input the number from user and perform the following**

    Example no=1234

    Output: one two three four

Java Practical Assignment

Date:01/01/22

Aim: Functions/Methods in java

Level:Basic

1. Write a functions in java to perform arithmetic operations(+,-,/,*) on given 2 numbers

2. Write a function in java to find roots of a quadratic equation $ax^2 + bx + c=0$

Level:Moderate

3.

Write functions in java to calculate gross salary, net salary and final salary of an employee based upon given table.

Designation	Basic	DA	HRA	PF	IT	Home Loan Installment
Manager	40000 - 60000	40% of basic	20% of basic	2000	30% of Net salary	x
Supervisor	20000 - 40000	40% of basic	20% of basic	1500	20% of Net salary	Y
Clerk	10000 - 20000	40% of basic	20% of basic	1000	10% of Net salary	z

Gross Salary = Basic + DA + HRA

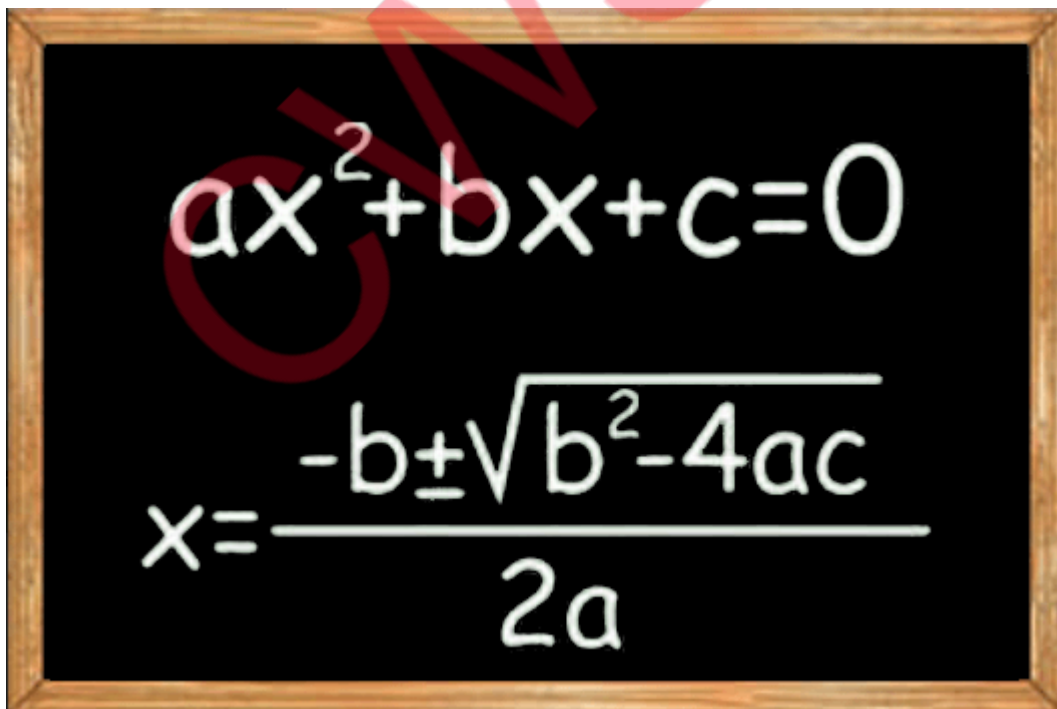Net Salary = Gross Salary - PF- Homeloan

Final Salary = Netsalary - IT

Extra practice

1. Write a java program to create the function called prime() to check number is prime or not
2. Write a java program to create the function called fibonacci() to calculate sum of Fibonacci series
3. Write a java program to create the function called factorial() to Print factorial of a number.

4. Write a java program to create the function called vowel() to Print string after deleting vowels

Quadratic Equations

Quadratic equations are the polynomial equation with degree 2. It is represented as **ax^2 + bx +c = 0**, where a, b and c are the coefficient variable of the equation. The universal rule of quadratic equation defines that the value of 'a' cannot be zero, and the value of x is used to find the roots of the quadratic equation (a, b). A quadratic equation's roots are defined in three ways: real and distinct, real and equal, and real and imaginary.

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Nature of the roots

The nature of the roots depends on the **Discriminant (D)** where D is.

1. If D > 0, the roots are real and distinct (unequal)
2. If D = 0, the roots are real and equal.
3. If D < 0, the roots are real and imaginary.

Steps to find the square roots of the quadratic equation

1. Initialize all the variables used in the quadratic equation.
2. Take inputs of all coefficient variables x, y and z from the user.
3. And then, find the discriminant of the quadratic equation using the formula: Discriminant = (y * y) - (4 * x *z).
4. Calculate the roots based on the nature of the discriminant of the quadratic equation.
5. If discriminant > 0, then
   Root1 = (-y + sqrt(det)) / (2 * x)
   Root2 = (-y + sqrt(det)) / (2 * x)
   Print the roots are real and distinct.
6. Else if (discriminant = 0) then,
   Root1 = Root2 = -y / (2 * x).
   Print both roots are real and equal.
7. Else (discriminant < 0), the roots are distinct complex where, Real part of the root is: Root1 = Root2 = -y / (2 * x) or real = -y / (2 * x). Imaginary part of the root is: sqrt(-discriminant) / (2 * x). **Print both roots are imaginary, where first root is (r + i) img and second root is (r - i) img.**
8. Exit or terminate the program.

Pseudo Code of the Quadratic Equation

1. Start
2. Input the coefficient variable, x, y and z.
3. D <- sqrt (y * y - 4 * x * z).
4. R1 <- (-y + D) / (2 * x).
5. R2 <- (-y - D) / (2 * x).
6. Print the roots R1 and R2.

7. Stop

Write a Java program to:
1) Create an array of 5 elements, take input of 5 integer elements and display the array.
2) Check total number of the negative, positive and zero element(s) in the array and display the count for the same.
3) Implement user-defined function to perform step 2.

Output:
Enter five elements: -5, 0, -1, 0, 23

Array elements are: -5, 0, -1, 0, 23
Total no. of negative elements: 2
Total no. of positive elements: 1
Total no of zeros: 1

2) Write a program in Java to
1) read n number of values in an array and display it in reverse order.
2) to count a total number of duplicate elements in an array.
3) To sort elements of array in descending order.

3) Write a program to do the following:
A) Take input 10 numbers.
a. Find sum and average of the number
b. Display the result
B) Search number in given array and display its position
a. Replace a number by a given number
b. Replace any number at given position by a given number
C) Extend the above program to find minimum and maximum of 10 input numbers.

Structured Programming Methodology Lab practical Assignment

Date:10/01/22

Aim Arrays

Level: Basic

- **Write a java program to find biggest number, smallest number, sum of numbers and average of numbers for array of numbers.**

- **Write a java Program to print the sum of the inputted number**
  Example : if no = 4567
  Then sum of the no = 4+5+6+7 = 22

- **Write a java Program to input an array of integers and display the second highest number.**
  Example
  10 20   5   7   30
  Output   20