List of Programs [01]

PM Jat, DA-IICT, Gandhinagar

1. Compute average of given two numbers

2. Calculate \( d = \frac{a+c}{b} \) with formatted results

3. Write a program that swaps values of two variables

4. Calculate perimeter and area of a rectangle, where width and

5. Calculate area of a triangle.
   Use following formula to calculate Area-
   \[
   \text{Area} = \sqrt{s(s-a)(s-b)(s-c)} \quad \text{where}, s = \frac{(a+b+c)}{2}
   \]

6. Write a program that converts input temperature in Fahrenheit to the corresponding centigrade.


8. Calculate Surface Area and Volume of a Cylinder.

9. Input a distance in Meters from console and output the distance in Feets and Inches.


11. Use formula \( \frac{1}{R} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3} \), where \( R1, R2, \) and \( R3 \) are resistances in parallel and are input. \( R \) is resultant resistance.

12. Determine if a number \( a \) is divisible by another number \( b \).

13. Calculate net bill amount for a garment shop. A shopkeeper sales Trouser for Rs 450 and Shirts for Rs 250. Shopkeeper allows 10% discount on any sale more than Rs 1000/-.


15. Hourly wage calculation with over time payment.
   In a company workers are paid on the basis of hours they worked for with the hourly rate of Rs 50. Overtime at the rate of 150% of regular rate is paid if a worker works for more than 40 hours a week. Write a program, which accepts the number of hours worker has worked and output net wage payable to the worker.

16. Compute Pythagorean triple \( m^2-n^2, 2mn, \) and \( m^2+n^2 \) for given \( m \) and \( n \).

17. Input a number and print “Negative” if value is less than zero, print “Zero” if it is zero otherwise print “Positive”.

18. Determine largest of given three numbers.

19. Compute overall grade of a students by reading marks in three subjects.
   In an examination system, students take three papers; marks are scored out of 100 in each subject. Percentage marks in all subjects is used to award grades to the students as shown in table below –

<table>
<thead>
<tr>
<th>% Marks</th>
<th>&gt;=75</th>
<th>&lt;75 and &gt;=60</th>
<th>&lt;60 and &gt;=50</th>
<th>&lt;50 and &gt;=40</th>
<th>&lt;40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

Write a program to input marks of three subjects, output marks of all subjects, total marks, percentage marks, and grade of the student.
20. A company AquaPure Limited has three models of their water purifying
equipments, namely AQ101, AQ201, and AQ301. Maximum retail prices (MRP)
of these equipments are Rs. 5750, 6750, 8750 respectively. Salesman transfer
prices (STP), in which equipment is transferred to salesman are Rs 5100, 6000,
7900 from the company. Salesman makes a sale in Sale price (SP). Difference of
SP and STP is paid to the salesman as commission. In addition company also pays
1% turnover commission if salesman makes sale of more than Rs 50,000 in a
month.

Develop algorithm to calculate total sales commission of an employee for the
month, while list of equipment sold with their sale price is input.

21. Write a program which can work as mini calculator. You must able to type in a
simple expression in the form of $23 + 45$, or $34 / 3$. Only four operators $+,-,*,$
and $/$ are supported.

22. Suppose a telephone company has 4 subscription plans. Each plan has Monthly
tariff, No of free calls, and charges per call as given below-

<table>
<thead>
<tr>
<th>Plan</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff</td>
<td>225</td>
<td>325</td>
<td>425</td>
<td>525</td>
</tr>
<tr>
<td>No of Free calls</td>
<td>0</td>
<td>30</td>
<td>60</td>
<td>150</td>
</tr>
<tr>
<td>Charges per Call</td>
<td>2.20</td>
<td>1.80</td>
<td>1.40</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Write a program to input subscribers plan and number of calls made and to print
bill amount for the month..

23. Prints out the numbers from 1 to 10, each on separate line.

24. Calculate sum of the first n numbers i.e. $1 + 2 + 3 + \ldots \ n$.

25. Sum and average of indefinite number of +ve numbers, indicate end of data with 0.

26. Tabulate $x$, $\sin(x)$ for $x$ from 0 to 90 with step of 5.

27. Calculate average male and female height of a class.

28. The sum of the first n numbers $1 + 2 + 3 + \ldots \ n$, using do-while

29. “Guess a number to win” game. User is asked to guess a number in the range of 0
to 10. If users guess matches with the computers guess, user wins a point. User can
make any number of attempts, if overall score is more than 30% of attempts made
then the user is winner.

30. Print Table of a given number n.

31. Write a program to calculate sum of squares of all odd integers from 17 to 335.
Exclude integers divisible by 7.

32. Sum up the series $1+2^2+3^2+4^2+\ldots+n^2$, while n is input.

33. Sum up the series $1+x+x^2+\ldots+x^n$, while n and x are input

34. Write programs to print the number as shown below-

```
1
12
123
1234
12345
123456
```

Do it using for and while loop.
35. Sum and average for indefinite number of +ve numbers, indicate end of data with 0, use continue and break

36. Sum and average for indefinite number of +ve numbers, indicate end of data with 0, use do-while and continue

37. Compute Sales commission for AquaPure Limited

38. Sum and average for indefinite number of +ve numbers, indicate end of data with 0, use do-while, continue and goto

39. Reverse digits of a given number.

40. Compute \(1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \ldots + \frac{x^n}{n!}\)

41. Generate N terms of a Fibonacci Series

42. Generate the Cartesian coordinates of points on the perimeter of a circle of given radius \(r\) for angles from 0 to 90 with the step of 5.

43. Write a program to determine bill amount of a consumer, while consumer type and units consumed are input. There are three types of consumers and following rules are used for calculating bill amount:

<table>
<thead>
<tr>
<th>Consumer Type</th>
<th>Meter charges</th>
<th>Units Consumed</th>
<th>Rate per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic User</td>
<td>Rs 350</td>
<td>&lt; 300</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>301 to 600</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 600</td>
<td>3.5</td>
</tr>
<tr>
<td>Business User</td>
<td>Rs. 500</td>
<td>&lt; 500</td>
<td>3.3</td>
</tr>
<tr>
<td>Single Phase</td>
<td></td>
<td>501 to 2000</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 2000</td>
<td>3.9</td>
</tr>
<tr>
<td>Business User</td>
<td>Rs. 2000</td>
<td>&lt; 1000</td>
<td>4.5</td>
</tr>
<tr>
<td>Three Phase</td>
<td></td>
<td>1001 to 5000</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 5000</td>
<td>4.1</td>
</tr>
</tbody>
</table>