

## Lab Sheet 3 & 4

### Write these Questions: 1, 2, 8, 11, 14, 16, 18, 19, 20, 26, 29 and 31

1. Write a program to determine if a person is eligible for voting. Age has to be eighteen or above for a person to vote.
2. Write a program to find whether a number is even or odd.
3. Write a program to test if the number input is positive, negative or zero.
4. Write a program to read three numbers & calculate their sum & average. If sum is in the range of 100 & 200 print the message, "Sum is in the allowed range". Else, print the message, "Sum has exceeded the range".
5. Write a program to calculate the parking charges of a vehicle. Input type (a character: 'c' for car, 'b' for bus, 's' for scooter/ motorcycle/ cycle) and the number of hours. The charges are as follows:-

Truck/ Bus – Rs. 50 per hour

Car – Rs. 25 per hour

Scooter/ MotorCycle/ Cycle – Rs.10 per hour

6. A company decides to give a bonus to all its employees on Diwali. A 5% bonus on salary is given to the male workers and 10% bonus is given to female workers. Write a program to enter the salary and gender of the employee. If the salary is less than Rs.10000 then employee gets an extra 2% bonus on salary. Calculate the bonus that has to be given to the employee and display the salary that the employee will get.
7. Write a program to enter the marks of a student in four subjects. Calculate and display the total and average marks.
8. Get the marks (an integer) from the user as input and output the grades along with the number of conditional expressions executed for determining the grades. Assign grades according to the following table.

A+ : 95- 100

A : 90-94

B+ : 80 - 89

B : 75 -79

C+ : 70 - 74

C : 60 - 69

D- : 50-59

P : 40- 49

F : below 40

9. Write a program to calculate the electricity bill based on the following information

Consumption Units	Rate
0-150	Rs 3 per unit
151-350	Rs 100 plus Rs 3.75 per unit exceeding 150 units
351-450	Rs 250 plus Rs 4 per unit exceeding 350 units
451-600	Rs 300 plus Rs 4.5 per unit exceeding 450 units
Above 600	Rs 1000 plus Rs 5 per unit exceeding 600 units

The user should input the electricity consumption in unit and display the bill amount.

10. Using switch statement determines if the input character is a vowel or not.

11. Write a program to enter a number from 1 to 7 and display the corresponding day of the week using switch case statements.
12. Using while loop print even numbers between 1 and 25.
13. Write a program to calculate the sum of the first 'n' natural numbers. Note: Write three versions of the program.( using while, do -while and for loop)
14. Using while loop write a program that reads an integer until 999 is encountered. Also count the number of positive, negative and zeroes entered by the user.
15. Write a program using do-while loop to display the square and cube of first n natural numbers.
16. Write a program that inputs a positive integer number n and outputs the odd numbers between 1 and n. For example, for n = 12, program should output:1 3 5 7 9 11
17. Using for loop print the multiplication table of input number.
18. Write a program to calculate the factorial of a number using for loop.
19. Write a program to calculate the pow(x,y) , i.e.  $x^y$  using loop.
20. Write a program to print the list of all leap years between 1900 to 2100 . [Note: Leap year comes once in every four years E.g. 1996, 2004, 2016 End of century is not always a leap year. E.g. 2100, 2300 Leap year comes after every 400 years. E.g. 2000, 2400, 2800]
21. Write a program to read a hexadecimal number. Calculate and display the decimal equivalent of this number.
22. Write a program to sum the series  $1+1/2+1/3+...+1/n$  .
23. Write a program to generate the following series .You may limit the input with an integer variable. 2, 4, 16, 256, 65536....  
 Example:  
 Sample Input : 500  
 Sample Output : 2 ,4, 16, 256
24. Write a program to find the number of vowels in a given string (Read one character at a time using getchar() example given below) . Print the number of each individual vowels and total number of consonants. Write the program using else -if.  

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while ((c = getchar()) != EOF)
{
    // This will read on character at time
    // and read till the input is end of file (ctrl+d)
}

```
25. Write a program which prints out the character set. Use a for statement to loop from 0 to 127. The body of the for loop should be a printf() statement which prints out the integer controlling the loop. Print this integer twice, once as a decimal (%d format) and once as a character (% c format). The output will give you a list of the characters and their corresponding codes. Some of the characters which are not printable but many of them will be recognizable.
26. Write a program which implements a trivial encryption scheme. The program should read a single character using getchar() , add the integer value 13 to the character, and output the result. Continue to loop until getchar() returns EOF .Also write a corresponding decryption program to restore the input to its original state.
27. Write a menu driven program to read three numbers and display the following menu that offers six options  
 Calculate total.  
 Calculate average.  
 Display the smallest.  
 Display the largest value.  
 Exit.  
 Use switch case to check the selection and do the task. The program should work in a loop and quit only when the user selects the Exit option.

28. Write a program that reads a positive integer number m and then prints the English name of each digit of that number in a single line. For example, for m = 147, program should output: one four seven
29. Write a menu driven program to find the decimal equivalent of the following choice of 'base' entered by the user:
  - Binary.
  - Hexadecimal.
  - Octal.
  - Exit.

Use switch case to check the selection and do the task. The program should work in a loop and quit only when the user selects the Exit option. Don't use format specifiers(%o or %x) for conversion. Write a program to print the reverse of a number .
30. Write a program to check whether the entered number is a palindrome.
31. Write a program to enter a number and then calculate the sum of the digits of a number.

Nested Loops:

Using nested for loops print the following patterns:

a) \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*

b) 1  
 12  
 123  
 1234  
 12345

c) A  
 B C  
 D E F  
 G H I J

d) \*  
 \* \*  
 \* \* \*  
 \* \* \* \*  
 \* \* \* \* \*  
 \* \* \* \*  
 \* \* \*  
 \* \*  
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