**LABSHEET-5**

**LOOPS**

**Questions 6 to 13, 18, 19, 22d, 22f, 22k**

**Do the following programs and write the code in lined page and paste printout of terminal output in the right side of the corresponding page.**

**Questions 23-35**

**Type, compile and execute the following programs and record the results and observations in the lab workbook. Get the signature from the faculties in charge of the lab towards the end of the lab**

1. Using ***while*** loop ***print even numbers*** between 1 and 25.
2. 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)
3. Using while loop write a program that ***reads an integer until 999*** is encountered. Also ***count the number of positive, negative and zeros*** entered by the user.
4. Write a program using ***do-while*** loop to display the ***square and cube of first n natural numbers***.
5. 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
6. Using for loop print the ***multiplication table*** of input number.
7. Write a program to calculate the ***factorial of a number*** using ***for loop***.
8. Write a program to calculate the ***pow(x,y)***, i.e. xy using loop.
9. 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]

1. Write a program to ***read a hexadecimal number***. Calculate and display the ***decimal equivalent*** of this number.
2. Write a program to sum the series ***1+1/2+1/3+…+1/n***.
3. 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

1. 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.

while ((c = getchar()) != EOF) { //This will read on character at time

}// and read till the input is end of file (ctrl+d)

1. 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.
2. 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.

1. Write a ***menu driven program*** to read ***three numbers*** and display the following menu that offers six options
2. Calculate total.
3. Calculate average.
4. Display the smallest.
5. Display the largest value.
6. 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.

1. 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
2. Write a ***menu driven program*** to find the decimal equivalent of the following choice of *‘base’* entered by the user:
3. Binary.
4. Hexadecimal.
5. Octal.
6. 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.

1. Write a program to print the ***reverse of a number***.
2. Write a program to check whether the entered ***number is a palindrome***.
3. Write a program to enter a number and then calculate ***the sum of the digits of a number***.

**Nested Loops:**

1. Using nested for loops print the following patterns:
   1. \*\*\*\*\*\*\*\*  
      \*\*\*\*\*\*\*\*  
      \*\*\*\*\*\*\*\*  
      \*\*\*\*\*\*\*\*
   2. 1  
      12  
      123  
      1234  
      12345
   3. A  
      AB  
      ABC  
      ABCD  
      ABCDE
   4. 1   
       12   
       123   
       1234  
      12345
   5. $ \* \* \* \*  
      \* $ \* \* \*  
      \* \* $ \* \*  
      \* \* \* $ \*  
      \* \* \* \* $
   6. \*  
      \* \*  
      \* \* \*  
      \* \* \* \*   
      \* \* \* \* \*  
      \* \* \* \*  
      \* \* \*  
      \* \*  
      \*
   7. 1  
      10  
      101  
      1010  
      10101
   8. 1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

* 1. Pass 1:1 2 3 4 5

Pass 2:1 2 3 4 5

Pass 3:1 2 3 4 5

Pass 4:1 2 3 4 5

Pass 5:1 2 3 4 5

* 1. 0000000000

0000000000

0000000000

0000000000

* 1. 1  
     121  
     12321  
     1234321  
     123454321
  2. 1  
     2 \* 2  
     3 \* 3 \* 3  
     4 \* 4 \* 4 \* 4  
     5 \* 5 \* 5 \* 5 \* 5

**Predict the output of the following:-**

1. int main()

{

char cnt=0;

for(;cnt++;printf("%d",cnt)) ;

printf("%d",cnt);

return 0;

}

1. int main()

{

int tally=0;

for(;;)

{

if(tally==10)

break;

printf("%d ",++tally);

}

return 0;

}

1. int main()

{

int i,j,charVal='A';

for(i=5;i>=1;i--)

{

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

printf("%c ",(charVal+j));

printf("\n");

}

return 0;

}

1. int main()

{

int cnt=1;

do

{

printf("%d,",cnt);

cnt+=1;

}while(cnt>=10);

printf("\nAfter loop cnt=%d",cnt);

printf("\n");

return 0;

}

1. int main()

{

int loop=10;

while(printf("Hello ") && loop--);

return 0;

}

1. int main()

{

int i=2,j=2;

while(i+1?--i:j++)

printf("%d",i);

return 0;

}

1. int main()

{

int i,j;

i=j=2,3;

while(--i&&j++)

printf("%d %d",i,j);

return 0;

}

1. int main()

{

int i;

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

printf("%d",i);

return 0;

}

1. int main()

{

int i;

for(i=10;i<=15;i++){

while(i){

do{

printf("%d ",1);

if(i>>1)

continue;

}while(0);

break;

}

}

return 0;

}

1. int main()

{

int i,j,k;

for(i=0,j=2,k=1;i<=4;i++){

printf("%d ",i+j+k);

}

return 0;

}

1. int main()

{

double k = 0;

for (k = 0.0; k < 3.0; k++)

printf("Hello");

return 0;

}

1. int main()

{

int i=5;

do{

printf("%d",i);

continue;

i++;

} while(i<=10);

return 0;

}

1. int main()

{

int i,j,k;

for(i=0;i<3;i++){

for(j=0;j<3;j++){

printf(" %d",i+j);

}

}

return 0;

}