## Loop Control Statements:

Loop: A Loop is defined as a block of statements which are repealedly executed for certain number of times. ..

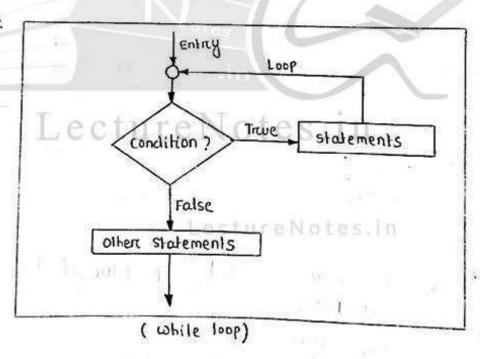
- The c language supports three types of loop control statements.
  - 1. while loop
  - 2. do ... while loop
  - 3. For loop ure Notes in
- 1. while loop: The while loop repeats a statement untill the test at the top returns false.
- → <u>Synlax</u>: while (condition)

  {

  Slatements;
  }

Other statements;

-Flowchard:



→ In while loop first, Condition is evaluated. If it is true statement is executed and condition is neevaluated. This cycle continue until condition becomes false

```
Example: /x write a program to print the numbers from 1 to 10
              wing while loop */
 # include <sldio.h)
 # include < conto.h>
 void main ()
    inla=1;
     closed(); tureNotes.in
     while ( a <= 10)
        printf ( " /d/t ", a);
          a = a+1; /* slatement that changes the value of the
                                   Condition */
     preintf (" \n");
   getch();
                                            10
                   3
owpul:
Example: / * write a pragram to print numbers in neverse order
            from 1 to 10 with a difference of 2 */
 # include < sidio.h>
 # include < conio.h>
 void main()
     th k = 10;
     claca();
     While (K>=2)
         { preintf ( " 1.d/t", K);
            K = K-2;
            printf ("\n");
            Belch();
```

```
Output: 10 8
 Example: 1* write a program to print the sum of digits of
              any number *1
 # include <sidio.h>
 # include (conio.h)
 void main()
  {
    int n, Sum = 0, nem;
    chuca();
    print ( " In Enter the number : ");
     scanf (" /d", & n);
     while (n>0)
            nem = n / 10;
            Sum = Sum + nem ;
            n = n/10;
      printf (" sum of digits of 1.d is = 1.d \n", n, sum);
   gelch();
               ectureNotes.in
output: Enter the number : 1245
         sum of digits of 1245 is = 12
Example: 1 * write a program to convert the binary number to
            a decimal number * /
#include <sidio.h)
# include (conio.h)
 void main ()
 int n, nsave, nem, d, j=1, dec = 0;
   chuca();
```

```
print ( " Enter the number in binary : \n");
  scanf (" 1.d", 80);
   nsave = n ;
   while (n>0)
          nem = n 1.10;
          d = nem * ; ;
         dec = dec +d;
          j = j x 2;
         n = n/10;
    print ( " Binary number = 1.d Decimal number = 1.d/n", nsave, dec);
    getch();
          Enter the number in binary: 1101
 output:
          Binary number = 1101 Decimal number = 13
2. do ... while loop:
   This is very similar to the while loop except that the test
   occurs at the end of the loop body.
-> This guarantees that the loop is executed alleast once before
   continuing.
    synlax:
                     statements;
                   I while (expression);
   In do-while loop, the statement is executed then expression
    is evaluated. If its is true, statement is evaluated again
   and so on. when expression becomes false loop terminales.
```

```
→ Flowchart:
                         Entry
                    statements
                               True
                    Expression
                         False
                 Other Statements
                    (do .... while loop)
Example: / * write a program to print the numbers from 1 to 10
            wing do .... while loop x |
 # include < stdio.h)
 # include < conio.h>
 void main() Lecture Notes.in
   int i=1;
   do { print ("1.d\t", i); ecture Notes.in
         i=i+1;
      } while (ix=10);
    print ( " \n");
guch();
output: 1
```

```
Example: 1* write a program to count the digits in any number */
#include <sidio.h>
# include (conio.h)
void main()
   int n, count = 0; meson
   chuckes;
   prints (" Enter the number : \n");
    scanf ("1.d", &n);
    do {
          n = n/10 ;
           Count + + ; .
       I while (n>0);
      printf (" Number of digits = 1-d/n", count);
   getch();
 7
output: Enter the number : 5453
         Number of digits = 4 Notes in
Example: 1* write a program to find the sum of the numbers
             entened from the keyboard *
                             Lecture Notes, in
# include <stdio.h>
# include (conio.h)
 void main ()
   int n, sum = 0;
   checi();
   print ( " Enter the numbers ( D to Stop):");
    scanf ("1.d", & n);
 do { Sum = Sum +n;
   } while (n! = 0);
```

```
Assignment: 1* write a program to find the product of digits.
                of any number x1
 # include (sidio.h)
 # include < conio.h>
  void moun()
  £
     int n, product = 1, nem;
      Claca(); reNotes.in
     printf ( " Enten the number : \n");
      scanf ( " 1.d", &n);
      while (n>0)
          nem = n/10;
          Preduct = preduct * nem;
          n = n/10;
   printf (" product of digits = 1.d/n", product);
   gelch();
         Enter the number : 234
output:
          product of digits = 240 tes. In
Assignment: In write a program to find the Pactorial of any
                 number * Lecture Notes.in
# include (sldio.h)
# include < conio. h>
void main ()
{ int n. num;
   long fact = 1;
   chacon ();
```

```
printf ( " Enter the number : \n");
  scanf (" 1.d", &n);
  num = n;
 if (nco)
      Printf (" No factorial of negative number \n");
  else
         while (nx1) testin
                fact = fact * n;
                n -- ;
    printf (" Factorial of 1.d is = 1.d \n". num, fact);
  getch();
output: Enlen the number : 4
          Factorial of 4 is = 24
Assignment: 1x write a program to check whether a number
             is palindnome on not x
 #include (sidio.h)
 # include (conio.h)
 void main ()
  1
     int num , nev = 0 , nem ;
     cluca();
    prunif (" Enter a number: !n");
     scanf (" 1.d", & num);
 while ( num 1 = 0 )
```

```
nem = 'num 1.10;
    num = num/10;
    nev = nev +10+nem ;
  "printf (" Reverse of a no. is 1.d \n", nev);
 if ( num = = rev)
        printf ( " The no. is palindrome");
  else
        & printle (" The no. is not a palindrome");
getch ();
         Enter a number: 125
oulput:
         Revense of a no. 15 521
         The no. is not a palindrome
          LectureNotes.in
```

Lecture Notes.in

```
Prunif ( " sum is 1.d/n", sum);
 getch();
                                          [ References : 1. S. Snivaelhava
OW PW :
                                                     2. A.K. Rath ]
                     Lesson Number: 19
3. For loop: The for loop allows to execute a set of instructions
  until a certain condition is satisfied.
→ Syntax :
  for (initialize counter; test condition; ne-evaluation parameter)
      Statements ;
  Flowchard:
                      Initialization Expression
              Condition?
                                True
                         Body of Loop
                       Updale Expression
                                          Next Statement
                                          ow of loop
                      ( for loop)
```

```
Example: Ix write a program to print the numbers 1 to 10 using
            for loop x/
 # include <sidio.h>
 # include (conio.h)
 void main()
    in n;
    clower();
    for (n=1; n<=10; n++)
         preintf ( " 1.d/t", n);
       } Printf ("\n");
     guch();
 outpul: 12345678
Example: / x write a program to print numbers in neverse order
        from 1 to 10 with a difference of 2 */
 # include (sidio.h)
 # include (conio.h)
 void main() ecture Notes.in
    int K;
    fon( K=10; K>=2; K-=2) ureNotes.in
         { print ("1.d/t", k);
     } praint("(n");
 gelch();
output: 10
```

```
Example: 1 * write a program to multiply two positive numbers
          without using * operator *
# include <sidio.h>
 # include < conio.h>
 void main(-)
    int a, b, t; tot nesult = 0;
     Chuca(); ureNotes.in
    printf (" Enter two numbers to be multiplied : \n");
    scanf ("1.d1.d", 2a, 26);
     for ( i= 1; i <= b; i++)
         nesul = nesul + a;
       print f ( " 1.d * 1.d = 1.d In", a. b. nesul);
     getch();
output: Enten two numbers to be multiplied: 4 5
           4 * 5 = 20
Example: 1 x write a program to find the sum of the series
              1+2+4+7+11+16+... upto n terems */
# include <stdio.h>
# include (conio.h)
void main ()
    int i, n, sum = 0, terem = 1 :
     closcon();
     printf ( " Enter the number of terms : \n");
     scanf ( "1.d", &n),
```

```
for ( i=1; i<=n; i++)
      Sum = Sum + terum ;
      term = term + i;
  printf (" The sum of series upto 1.d terms is 1.d \n", n, sum);
  gelch();
      LectureNotes.in
output: Enter number of terms: 4
     The sum of series upto 4 terms is 14
Example: 1* write a program to print the fibonacci series */
         1123581321....
# include <sidio.h>
# include < conio.h)
void main ()
   long X, Y, Z;
    int in;
   closen();LectureNotes.in
   X = 0;
   Y = 1;
  print ( "Enter the number of terms : \n");
  scanf (" 1.d", &n);
  print ( "1.d", Y );
   for ( i = 1; i < n; i++)
        Z = X + Y;
        print ( "1.d", z);
        X = Y ;
       Y = Z ;
```

```
Preintf ("\n");
 getch();
 output: Enter the number of terms: 3
          112
 Nesting of Econ loops:
→ when a loop is written inside the body of another loop, then it
   is known as nesting of loops.
- Any type of loop can be nested inside any other type of loop.
→ For example a for loop may be nested inside another for loop
  on inside a while loop on do ... while loop, similarly while and
 do....while loops can be nested.
 /* program to undenstand the nesting in for loop */
 # include (sidio.h)
 # include (conio.h)
 void main() Lecture Notes.in
 ٤
     inl i,j;
     for ( i=1; i <= 3; i++) 1 * outer for loop */
       { printf (" i = 1.d\n", i);
         for ( j=1; j<=4; j++) | * inner for loop */
               { prainif ( " j = 1.4/t", j) ;
                preint ("In");
        gelch ();
```

```
Output:
          t = L
           j = 1
                  j=2 ]=3 j=4
           i= 2
                 j=2 j=3 j=4
           j = 1
           i = 3
           j=1
                  j= 2
                         j=3 j=4
Example: 1 * write a preogram to find the anistrong number
            From loo to agg */
# include (sidio.h)
# include < conto.h>
void main()
   int num, n, cube, d, sum;
    chaca();
   printf (" Armstrong numbers are : \n");
   for ( num = 100 ; num < = 999 ; num ++) / * outer for loop */
           n=num;
           sum = 0 cture Notes.
           while (n >0) / + inner while loop x/
              { d=n/10;
                 n=nfio; Lecture Notes perfect no.
               cube = d *d *d;
               som = som + cabe;
                                          positive int. that
                                            is equal to the
    of (num = = Sum)
                                             Sum of its proper
            prunif (" f.d(t", num);
                                             divisions.
                                          EXP. 6, 28, 496,
    getch();
                                          Strong no.
                                          145 = 11 + 41 +51
                                              . = 145
```

```
owpul:
Example: 1 x write a program to detect the largest number out
           of five numbers and display it * 1
 # include < sidio.h>
 # include < conio.h>
 void main() ctureNotes.in
  1
    int a.b. c.d. e, sum = 0, i;
     chuch();
     printf ( " Enter five numbers : \n");
      scanf (" 1.d 1.d 1.d 1.d 1.d", 8a, 8b, 8c, 8d, 8e);
      Sum = a+b+c+d+e;
     for ( i = sum ; i < = sum ; i -- )
          if ( i = = a 11 i = = b 11 i = = c 11 i = = e )
               proint (" The langest number : "I'd", i);
            } break;
    getch();
        Enter five numbers: 5 2 7 3 10
owpul:
         The largest number : 10
```

```
ASSIGNMENTS
 /* program to print the following */
 # include < sldio.h>
 # include < conio.h}
  void main() reNotes.in
  3
    int tai, n;
     chuch ();
     printly ("Enter the number of rows: \n");
     scant (" 1.d", 20);
     for ( i=1 ; ix=n ; i++ )
          for (j=1; j<=i; j++)
               praint ( " * ");
              burnl (" /u");
    gerch() Lecture Notes. in
 3
   program to print the following */reNotes.in
# include <sldio.h>
# include < conio. h>
void main()
```

```
int n,i,j;
   chucut);
   Printf (" Enter the no. of rows \n");
    scanf ( " 1.d", & n);
    for (i=1; i <= n; i++)
     ٤
        for (j=1; j <= n-i; j++)
            praint (" ");
       for ( j=1; j<=i; j++)
            praintf (" * ");
            printf (" \n").
 gerch ();
1* write a preognam to preint the following * 1
        123 LectureNotes in
        1 2 3 4
# include (stdio.h)
# include (conio.h)
void main()
   iction toi
   chaci();
   prints ( " Enter the no. of rows /n");
    scanf (" 1d", 8n);
   for ( i=1 ; i <= n; i++ )
```

```
for ( j=1; j<=(; j++)
        Printf (" 1.d", 1);
        Printf (" \n");
   gelch();
    program to print the following * /
1*
        Lecture Notes.in
 # include < sidio - h)
# include (conio.h)
 () void main()
    int n, i, j.P;
    chacic();
    printf (" In How many rows");
    scanf ("1d", 2n).
    Pai Lecture Notes.in
    for ( 1=1; i <= n; i++)
        fon ( )=1; )<=i; )++ )ctureNotes.in
              proint ("1.d", p);
        preint ( " \n");
 getch();
```

```
[ References . I. A.K. Rath
                                                      3. Y. Kanellkart
                       Lesson Number : 20
    Solved programs:
  /* program to find the factorial of a number */
  # include < sidio.h)
  # include ( conio. h)
   void main ()
      int in;
      long fact = 1;
      checo ();
      printf ( "Enter the number 10");
      scanf ( " 1.d", 8 n);
      if (nco)
         printf (" No factorial will be found In");
      else
              for (i=1; i <= n; i++)
                   fact = Pact * i;
             prints (" The factorial of a no. is 1.dln", fall);
            LectureNotes.1
      getch();
 3
        Enter the number 5 Lecture Notes. In
         The factorial of a no. is 120.
/ * write a program to convert the decimal no. to binary */
#include (sidio.h)
# include < conio.h>
# include < math. h)
void main()
```

```
tot num, nem, n=0, sum=0;
   clrucn();
    prints (" In Enter a decimal number");
    scanf (" 1.d", & num);
   do {
          mem = num 1.2;
       Sum = Sum + ( rem * pow(10,n));
          num = num/2;
            n++;
       3 while (noo);
   prints (" Binary equivalent of decimal no. 1/d = 1/d/n", num,
                                                 sum);
  getch();
output: Enter a decimal number 5
       Binary equivalent of decimal no s = 101
/* program to find the neverse of a number */
#include (stdioth) TUTENOTES. 111
# include < conio.h)
void main ()
                         LectureNotes.in
    int num, nev = 0, nem;
    chaca();
    printf (" Enter the number \n:");
     Scanf (" 1.d", & num);
 while (num! = 0)
            nem = num /. 10;
```

```
num = num 10;
     men + of # van = van
  prunif (" Reverse of the number is 1.d/n", nev);
  gelch();
         Enler the number 453
          Revenue of the number is 354
/ * program to convert the lowercase letter to uppercase letter
      and uppercase letter to lowercase letter */
# include (stdio.h)
# include (conio.h)
() main()
   chan ch;
    clruen():
    printf (" In Enter a character: ")
    scanf (" /c", rch);
   if ( ch > = 65 & ch < = 90)
          ch = ch + 32 :
  else
        if (ch >= 97 88 ch <= 122)
            ch = ch - 32 ;
   print ( " /c", ch);
gelch();
         Enten a chanacter: A
owpul:
```

```
1 x write a program to print the following *1
  # include (stdio.h)
  # include (conio.h)
   void main()
                                         void main()
   ş
      in i is toi
                                           int tij
      chrisen();
                                         fon(i=1; i(=4; i++)
    Printf ( " In How many rows");
    scanf (" 1.d", 2 n);
   for ( i=1; (<=n; (++)
                                          printf ("10");
         fon (j=1; j <= n; j++)
          { if ( ]<= i)
                 printf ( " * ");
             else printf ("II", Notes in
        preint (" /n");
     getch ();
        Enter How many rows: 4
output:
```

```
/ * write a program to print the following */
                                         (1)
  # include <sldio.h>
  #include < conio.h>
                                          void maint)
  () nium biov
     inl i, j, n;
                                          inl i.j;
                                         fon (i=1; i<=4; i++)
     chacic):
    print (" How many rows / ");
                                          for (j=1; i(=2; j++)
     scanf ("1.d", 20);
                                           print (" 1.c", 'A' +
    fon ( i=1; i <= n; i++)
      { for (j=1; j <= n; j++)
                                            print! ("\n");
           (i=<1) 75 }
                  preintf ("
            else ecture Notes in on
                                            void main()
    printf ("10");
                            Lecture Note char 1;
                                            int i
   getch();
                                         for (i=0; i(4; i++)
                                         for (j=65; j<=65+i)
         How many
owput:
                                            paints ("1.c", 1);
                                          } prin1f("\n");
```

```
/ * write a program to print the following */
    # include <sldio.h>
    # include (conio.h)
    void main() eNotes.in
    in i.j.n;
      chuch();
    proint ( " How many rows /n");
scanf (" 1.d", &n);
     for ( i=1; ( = n; (++)
       { for ( )=1 ; | <= n ; j++)
                if ( i>= i)
         Lecture prints (" 6")1,11
                       eke prunif ("1");
                      LectureNotes.in
          preintf (" \n");
    gelch();
```

```
1 x write a program to print the following * 1
 # include < sidio. h>
 # include (conio.h)
 () nion biov
                                                0
 { in t, j, n;
    chuck();
    print ( "How many rows /n");
    scanf ("1.d", 8n);
   for ( i=1; i<=n; i++).
        { for ( )=1; i<=n; i++)
                   if ( j <= i)
                       printf ("0");
                else printf ("1");
           Printf (" \n");
gerch(3;
1 x write a program to print the following * 1
   # include (sidio.h)
   # include (conio.h)
   void main ().
    inl t,j,n;
       drucker;
      print ( " How many rows /n");
       scanf (" 1.d", 2n);
     for ((=1, (x=n, i++)
```

```
for (j=1; j<=n; j++)
     ¿ (('ç >= ?)
           (0== C.1.((+i)) fi
                    ; ("o") floing
            else
      Print ("In");
 gel ch();
1 x write a program to print the following
# include <stdio.h>
# include < conio.h)
Void main() Lecture Notes. in
   int i.j.n;
   druche);
  printf (" How many rows /n")=; Cture Notes. In
   scanf (" 1d", in);
  for ( i=1; i <= n; i++)
         for ( j=n; j>=1; j--)
           { if ( ] > = i)
                 point (" *"):
```

```
else prinif (" ");
   printf (" \n");
  getch();
/ * write a program to print the following * /
          LectureNotes.in
# include < stdio.h>
# include < conio.h>
void main ()
  ¿ in i c , j , n ;
     chacic);
  printf ( " How many rows /n");
   scanf (" 1.d", &n);
   for ( (=1; (<=n; (++)reNotes.in
         { fon (j=n; j>=1; j--)
             ₹ if (i>=i) Lecture Notes.in
                    prunif (" *");
              else printf (" ");
        bunjt ("/");
     getch();
```