

```
#include<stdio.h>
void main()
{
    unsigned int n;
    int x;
    char ch;

    printf("\nEnter N\n");
    scanf("%u",&n);
    printf("\n1. Loop Roll\n2. Loop UnRoll\n");
    printf("\nEnter ur choice\n");
    scanf(" %c",&ch);
    switch(ch)
    {
        case '1':
            x=countbit1(n);
            printf("\nLoop Roll: Count of 1's : %d",x);
            break;
        case '2':
            x=countbit2(n);
            printf("\nLoop UnRoll: Count of 1's : %d",x);
            break;
        default:
            printf("\n Wrong Choice\n");
    }
}

int countbit1(unsigned int n)
{
    int bits = 0,i=0;
    while (n != 0)
    {
        if (n & 1) bits++;
        n >>= 1;
        i++;
    }
    printf("Number of iterations %d \n",i);
    return bits;
}

int countbit2(unsigned int n)
{
    int bits = 0,i=0;
    while (n != 0)
    {
        if (n & 1) bits++;
        if (n & 2) bits++;
        if (n & 4) bits++;
        if (n & 8) bits++;
        n >>= 4;
        i++;
    }
    printf("Number of iterations %d \n",i);
    return bits;
}
```

```
akhil@Ubuntu:~/Compiler-Lab/11)loop unrolling$ gcc loopunroll.c
loopunroll.c: In function 'main':
loopunroll.c:16:5: warning: implicit declaration of function 'countbit1' [-Wimplicit-function-declaration]
   16 |     x=countbit1(n);
      |         ^~~~~~
loopunroll.c:20:5: warning: implicit declaration of function 'countbit2' [-Wimplicit-function-declaration]
   20 |     x=countbit2(n);
      |         ^~~~~~
akhil@Ubuntu:~/Compiler-Lab/11)loop unrolling$ ./a.out
```

Enter N

3

1. Loop Roll
2. Loop UnRoll

Enter ur choice

1

Number of iterations 2

Loop Roll: Count of 1's : 2

Enter N

2

1. Loop Roll
2. Loop UnRoll

Enter ur choice

2

Number of iterations 1

akhil@Ubuntu:~/Compiler-Lab/11)loop unrolling\$ █