

## IT 161\_ Lab5

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**Experiment 1:** Write a C program to convert a given decimal number to its equivalent binary number.

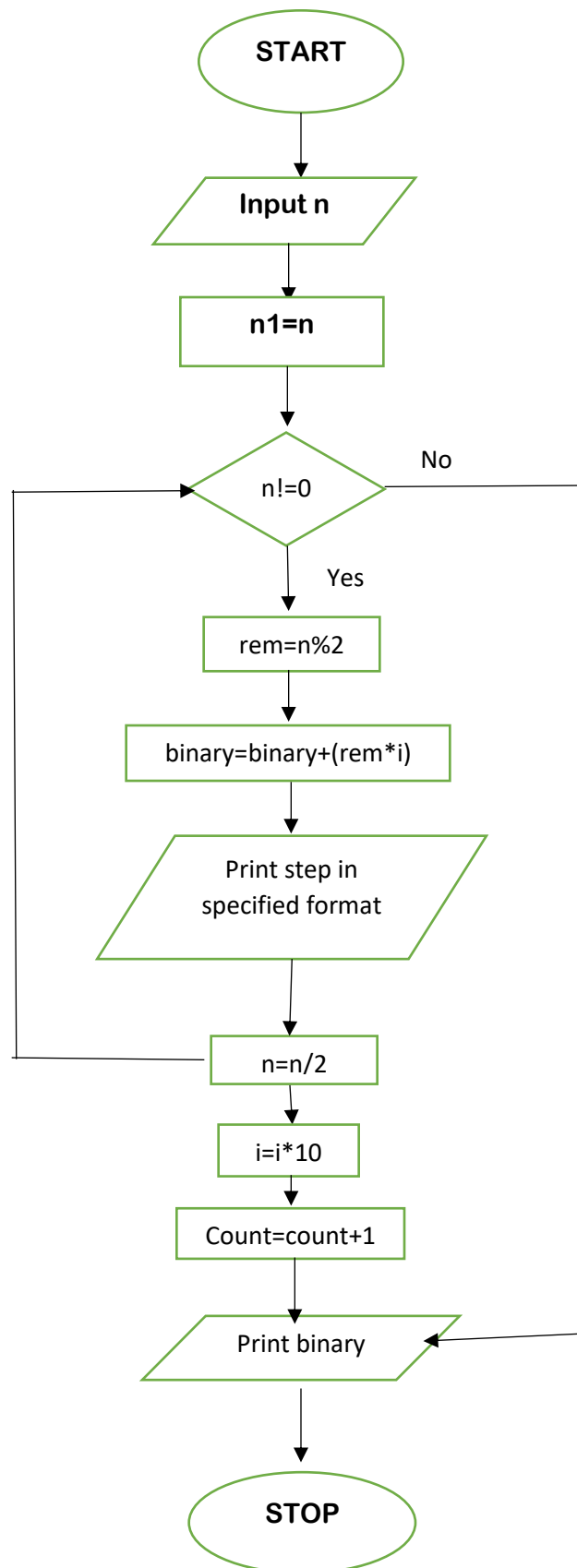
**Objective:** To create a C program to convert a decimal number to binary number.

**Software:** Online compiler and debugger for C

**Methodology:**

1. Declare variables n,rem,binary=0,i=1,count=1.
2. First input “n” is taken from user and stored in n1.
3. Check whether the input number is 0 or not. Follow steps 4-8 if the number is not 0. If input =0 then follow step 9 and 10.
4. Find  $n\%2$  and store it in rem.
5. Do  $\text{binary}+(\text{rem}*i)$  and update it to binary.
6. Divide the binary number by 2 and again check in step 3.
7. Do  $i*10$  and update it to i.
8. Increment the value of count by 1.
9. Print the number stored in binary.
10. End the program.

## Flowchart:



## CODE:

```
#include <stdio.h>
int main()
{
    int n,rem,binary=0,i=1,count=1;
    printf("Enter Decimal number:");
    scanf("%d", &n);
    while(n!=0)
    {
        rem=n%2;
        binary=binary+(rem*i);
        printf("step\n%d:%d/2 quotient=%d\t remainder:%d\t\n",count,n,(n/2),rem);
        n=n/2;
        i=i*10;
        count=count+1;
    }
    printf("Binary number is:%d", binary);
    return 0;
}
```



The screenshot shows a code editor interface with a toolbar at the top containing icons for Run, Debug, Stop, Share, Saved, Beautify, and Download. The language is set to C. The code in the editor is as follows:

```
main.c
1  /* Name:Dipean Dasgupta STD ID:202151188
2  IT161_LAB 5
3  This C program to convert decimal number to binary number*/
4  #include <stdio.h>
5  int main()
6  {
7      int n,n1,rem,binary=0,i=1,count=1;
8      printf("Enter Decimal number:");
9      scanf("%d", &n);
10     n1=n;
11     while(n!=0)
12     {
13         rem=n%2;
14         binary=binary+(rem*i);
15         printf("step\n%d:%d/2 quotient=%d\t remainder:%d\t\n",count,n,(n/2),rem);
16         n=n/2;
17         i=i*10;
18         count=count+1;
19     }
20     printf("%d in decimal = %d in Binary",n1,binary);
21     return 0;
22 }
23
24
```

## **RESULT:**

### **Sample:**

Enter decimal number: 17

Step

1.  $17/2$  Quotient=8 remainder= 1

Step

2.  $8/2$  Quotient=4 remainder= 0

Step

3.  $4/2$  Quotient=2 remainder= 0

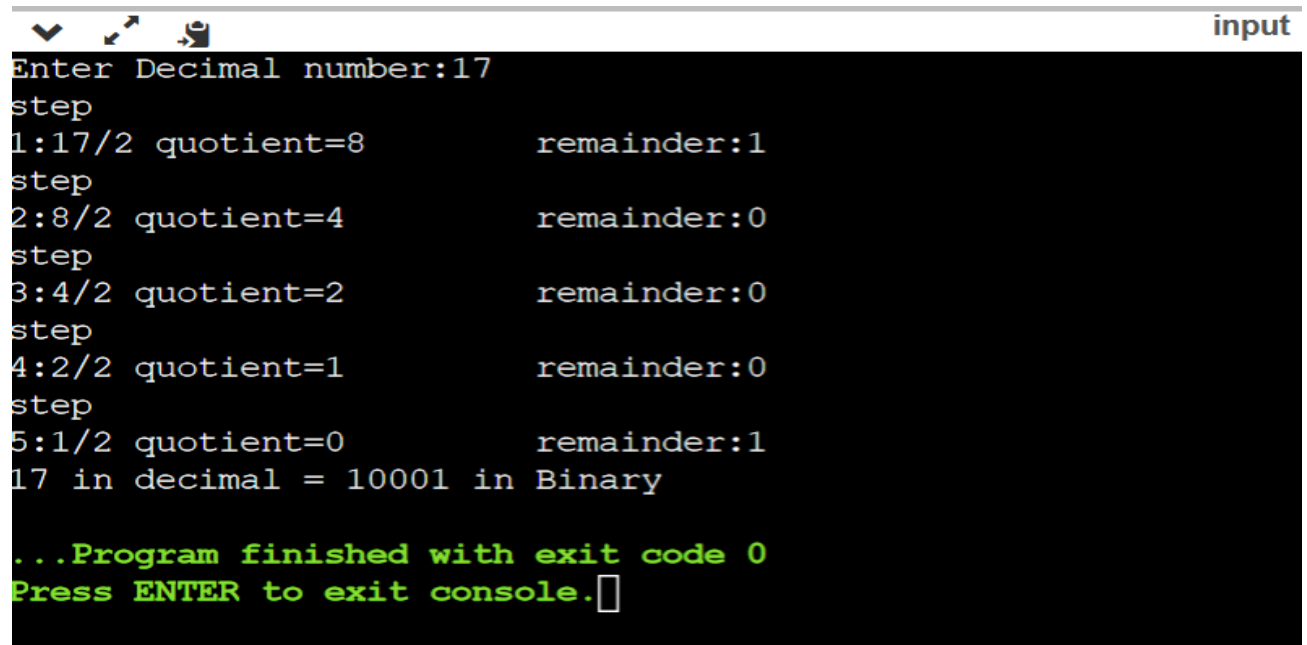
Step

4.  $2/2$  Quotient=1 remainder= 0

Step

5.  $1/2$  Quotient=0 remainder= 1

17 in decimal= 10001 in binary



```
input
Enter Decimal number:17
step
1:17/2 quotient=8      remainder:1
step
2:8/2 quotient=4      remainder:0
step
3:4/2 quotient=2      remainder:0
step
4:2/2 quotient=1      remainder:0
step
5:1/2 quotient=0      remainder:1
17 in decimal = 10001 in Binary

...Program finished with exit code 0
Press ENTER to exit console.
```

## **Experiment 2**

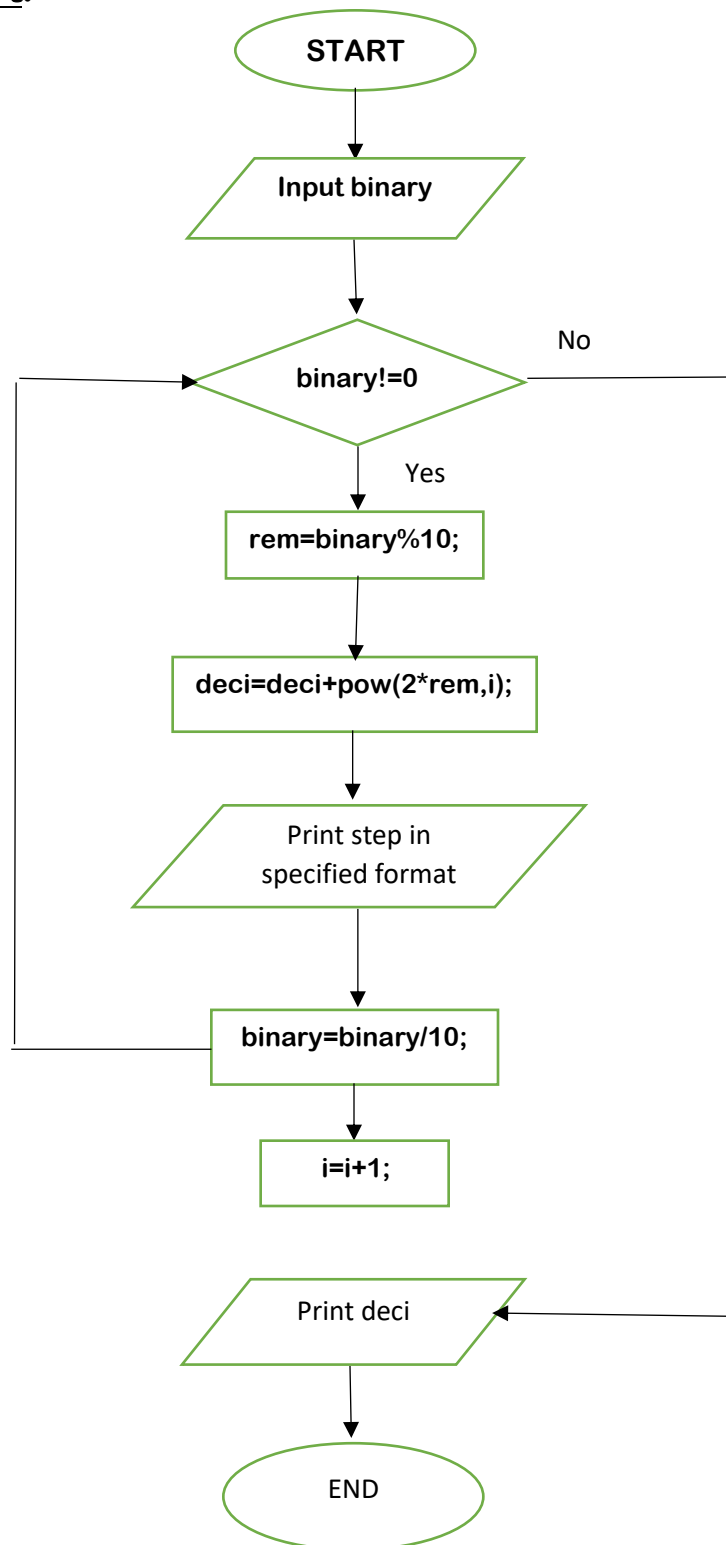
**Objective:** To create a C program to convert a given binary number to its equivalent decimal number.

**Software:** Online compiler and debugger for C

### **Methodology:**

1. Declare variable binary, rem, deci=0, i=0.
2. A binary number is to be taken as input and stored in binary.
3. Check whether the binary number is 0 or not. If the number is not zero then follow steps 4-7. If number becomes 0, follow step 8.
4. Calculate remainder by taking  $\text{binary} \% 10$  and store it in rem.
5. Then do  $\text{deci} = \text{deci} + \text{pow}(2^{\text{rem}}, i)$  and store it in deci.
6. After that divide the binary number by 10 and update it to binary and check the condition again.
7. Increment i by 1.
8. When the binary number becomes 0, then print the number stored in deci and stop the program.

## Flowchart:



## **CODE:**

```
#include <stdio.h>
```

```
#include<math.h>
```

```
int main()
```

```
{
```

```
    int binary,deci=0,rem,i=0;
```

```
    printf("Enter binary number:");
```

```
    scanf("%d",&binary);
```

```
    while(binary!=0)
```

```
    {
```

```
        rem=binary%10;
```

```
        deci=deci+pow(2*rem,i);
```

```
        printf("\nstep \n%d %d(2^%d) remainder%d quotient:%d\n",i+1,rem,i,rem,(binary/10));  
quotient:%d\n",i+1,rem,i,rem,(binary/10));
```

```
        binary=binary/10;
```

```
        i=i+1;
```

```
    }
```

```
    printf("The number in decimal is:%d",deci);
```

```
    return 0;
```

```
}
```

The screenshot shows a code editor with a toolbar at the top containing icons for file operations, running, debugging, stopping, sharing, saving, beautifying, and downloading. The language is set to C. The code is displayed in a dark-themed editor with line numbers on the left. The code is identical to the one provided in the previous blocks, including the header comments and the while loop logic.

```
main.c  
1  /*Name: Dipean Dasgupta STD ID=202151188  
2  This displays the program to convert binary to decimal*/  
3  
4  #include <stdio.h>  
5  #include<math.h>  
6  
7  int main()  
8  {  
9      int binary,deci=0,rem,i=0;  
10     printf("Enter binary number:");  
11     scanf("%d",&binary);  
12  
13     while(binary!=0)  
14     {  
15         rem=binary%10;  
16         deci=deci+pow(2*rem,i);  
17         printf("\nstep \n%d %d(2^%d) remainder%d quotient:%d\n",i+1,rem,i,rem,(binary/10));  
18         binary=binary/10;  
19         i=i+1;  
20     }  
21  
22     printf("The number in decimal is:%d",deci);  
23  
24     return 0;  
25 }  
26  
27
```

## **RESULT:**

### **Sample:**

Enter Binary number:1101

Step

1  $1 \cdot (2^0)$  remainder:1 quotient:110

Step

2  $1 \cdot (2^1)$  remainder:0 quotient:11

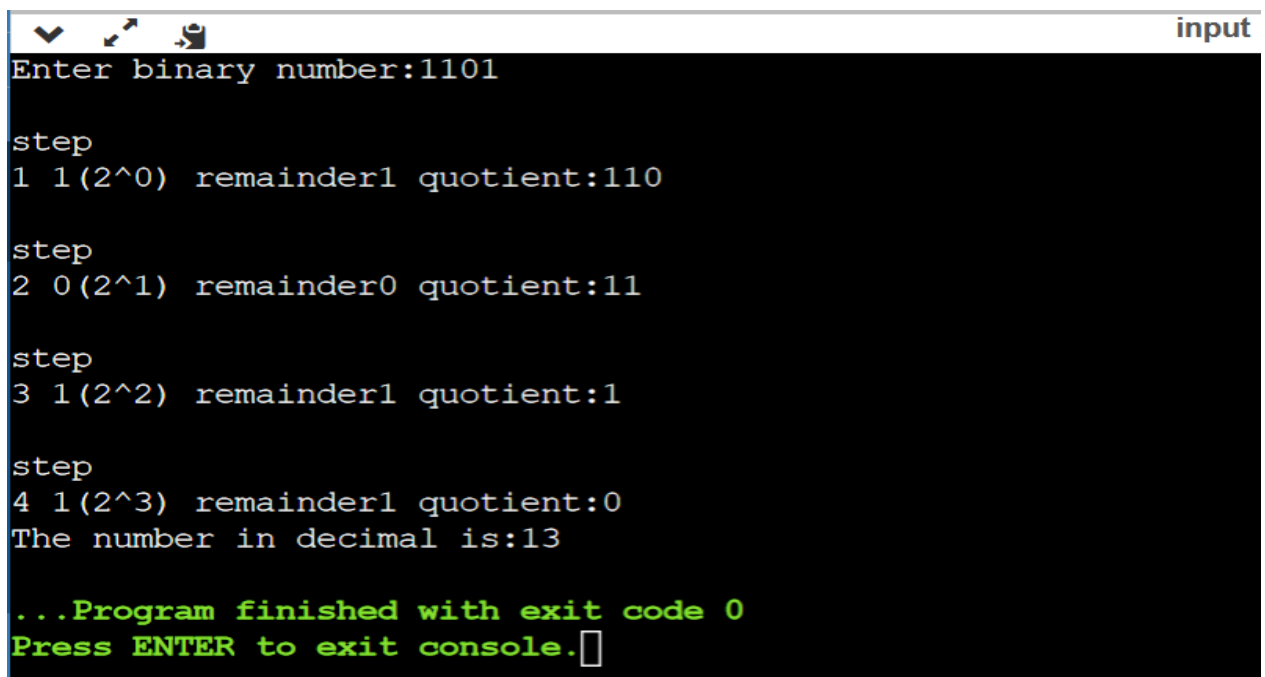
Step

3  $1 \cdot (2^2)$  remainder:1 quotient:1

Step

4  $1 \cdot (2^3)$  remainder:1 quotient:0

The number in decimal is: 13



```
input
Enter binary number:1101

step
1 1(2^0) remainder1 quotient:110

step
2 0(2^1) remainder0 quotient:11

step
3 1(2^2) remainder1 quotient:1

step
4 1(2^3) remainder1 quotient:0
The number in decimal is:13

...Program finished with exit code 0
Press ENTER to exit console.
```