**How to Convert Decimal to Binary**

Below are the steps for how to convert decimal to binary number -

**Step 1:** Divide given number starting from 2 as suitable.

**Step 2:** Write remainder on the right side of quotient.

**Step 3:** Divide untill quotient will be 0.

**Step 4:** Now write binary number starting from lower end of that divison.

**Step 5:** Now write given number including quotient of lower end.that should be starting point.

**How to Convert Decimal to Octal**

Below are the steps on decimal to octal conversion -

**Step 1:** Take the given decimal number

**Step 2:** If the number is less than 8 the octal number is the same

**Step 3:** If the number is greater than 7 then Divide the number with 8

**Step 4:** Note the remainder

**Step 5:** Carry on the step 3 and 4 with the qoutient till it is less than 8

**Step 6:** Write the remainders in reverse order(bottom to top)

**Step 7:** The resultant is the equivalent octal number to the given decimal number

**Convert Decimal to Hexadecimal**

It is 0 to 9 decimal number and hexadecimal number are same then after 10 represented as A and so on . As shown in the table.

|  |  |
| --- | --- |
| Decimal Number | Hexadecimal Number |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | A |
| 11 | B |
| 12 | C |
| 13 | D |
| 14 | E |
| 15 | F |

**Step 1:** 0 to 15 we can covert directly by this table.

**Step 2:** For other numbers. Divide the decimal number by 16.

**Step 3:** Remainder will always be less than 16.

**Step 4**: Quotient will write first

**Step 5:** Convert remainder by the help of table.

**Step 6:** After Quotient we will write the hexadecimal number of remainder.

**How to Convert Binary to Decimal**

Given below are the steps for how to convert binary to decimal -

**Step 1:** First, we count the number of binary digits in the given number. Let there be n numbers.

**Step 2:** Then, we multiply each digit with the 2n-1, when n is equal to number of position from right side.

**Step 3:** Then, we add each number.

**Step 4:** After addition, the resultant is equal to decimal value of that binary number.

**If the given number contain decimal then,**

**Step 1:** Count the number of digits after the decimal. Let it be m.

**Step 2:** Then, we multiply each digit after decimal with , where m is the number of position of digit from the decimal.

**Step 3:** Then, we add each number.

**Step 4:** After addition, the resultant is equal to decimal value of that binary number.

**How to Convert Binary to Octal**

Below are the steps for how to convert binary to octal -

**Step 1:**Take the given binary number

**Step 2:**Multiply each digit by 2n-1 where n is the position of the digit from the decimal.If it is a decimal number multiply the each digit in the decimal part by `1/2^m` ,m is the position of the digit from the decimal point

**Step 3:**The resultant is the equivalent decimal number for the given binary number.

**Step 4:** Divide the decimal with 8

**Step 5:** Note the remainder

**Step 6:** Continue the above two steps with the quotient till the quotient is zero

**Step 7:** Write the remainder in the reverse order

**Step 8:** The resultant is the required octal number for the given binary number.

## How to Convert Binary to Hexadecimal

Before going to how to convert Binary to Hexadecimal, lets us look into the basic hexadecimal table.

|  |  |  |
| --- | --- | --- |
| **Binary** | **Decimal** | **Hexadecimal** |
| 0000 | 0 | 0 |
| 0001 | 1 | 1 |
| 0010 | 2 | 2 |
| 0011 | 3 | 3 |
| 0100 | 4 | 4 |
| 0101 | 5 | 5 |
| 0110 | 6 | 6 |
| 0111 | 7 | 7 |
| 1000 | 8 | 8 |
| 1001 | 9 | 9 |
| 1010 | 10 | A |
| 1011 | 11 | B |
| 1100 | 12 | C |
| 1101 | 13 | D |
| 1110 | 14 | E |
| 1111 | 15 | F |

### Binary to Hexadecimal Table

Below are the steps for Binary to Hexadecimal conversion -

**Step 1:** The given number is in binary from.

**Step 2:** First,we have to change the **binary number into decimal number.**

**Step 3:** Then, we count the number of binary digits in the given number. Let there be n numbers.

**Step 4:** Then, we multiply each digit with 2*n*−1

, when n is equal to number of position from right side.

**Step 5:** Add all numbers after multiplication.

**Step 6:** Now, the binary number is in decimal number.

**Step 7:** Now, convert **decimal to hexadecimal**. If the decimal number is less than sixteen, it will be converted by above table.

**Step 8:** If decimal number is greater than sixteen, it should be divided by 16.

**Step 9:** Remainder must be less than 16. (It will be converted by table).

**Step 10:** Then, we write quotient first and then hexadecimal form of remainder together.

**Step 11:** The resultant is in hexadecimal form of given binary number.

**How to Convert Octal to Decimal**

Below are the steps to convert octal to decimal -

**Step 1:**Take the given octal number.

**Step 2:** Find out the number of digits in the number

**Step 3:** Let it have n digits.

**Step 4:** Multiply each digit in the number with 8n-1,when the digit is in the nth position.

**Step 5:** Add all digits after multiplication.

**Step 6:** The resultant is the equivalent decimal to the given octal number.

If octal number contains a decimal point

**Step 7:** Let m digits are there after the decimal

**Step 8:** Multiply each digit after decimal with`1/8^m` ,when the digit is the mth position.

All other steps are same as above.

## How to Convert Octal to Binary

Below are the steps which will help you to understand how to convert octal to binary number -

**Step 1:** Consider the given octal number

**Step 2:** Let the given number have n number of digits

**Step 3:** Multiply each digit of the number with 8n-1, when the digit is in the nth position from the right end of the number.If the number has decimal part the multiply each digit in the decimal part by `1/8^m` when the digit is in the mth position from the decimal point.

**Step 4:** Add all terms after multiplication

**Step 5:** The obtained value is the equivalent decimal number

**Step 6:** Consider the decimal number, divide it by 2

**Step 7:** Note the remainder

**Step 8:** Continue the above two steps for the quotient till the quotient is zero

**Step 9:** Write the remainders in the reverse order

**Step 10:** The obtained number is the equivalent binary number for the given octal number.

## How to Convert Octal to Hexadecimal

Below are the steps on octal to hexadcimal conversion -

**Step 1:** Let the number of digits in the number be n

**Step 2:** Multiply the digits with 8n-1where n is position of digit from the right end of the number.If the number has decimal

part the multiply digits after decimal by `1/8^m` where m is position of the number from the decimal

**Step 3:** Add the terms after multiplication

**Step 4:** The obtained number is equivalent decimal number to the given octal

**Step 5:** Consider the decimal number,divide it by 16

**Step 6:** Note the remainder.

**Step 7:** Continue the process till the quotient in zero

**Step 8:** Write the remainder in the reverse order

**Step 9:** The obtained number is equivalent hexadecimal number to the given octadecimal number.

## How to Convert Hexadecimal to Decimal

**See the below steps -**

**Step 1:** First we find the number of hexadecimal digits in the number. Let there be n numbers.

**Step 2:** Then we multiply each hexadecimal digit with 16*n*−1

, when n is equal to number of position from right side.

**Step 3:** Then we add each number after multiplication.

**Step 4:** The resultant is equivalent hexadecimal number of the given decimal number.

## How to Convert Hexadecimal to Binary

Below are the steps on hexadecimal to binary conversion -

**Step 1:** Take given hexadecimal number

**Step 2:** Find the number of digits in the decimal

**Step 3:** If it has n digits,multiply each digit with 2n-1where the digit is in the nth position

**Step 4:** Add the terms after multiplication

**Step 5:** The resultant is the decimal number equivalent to the given hexadecimal number.Now we have to convert this hexadecimal to binary number.

**Step 6:** Divide the decimal number with 2

**Step 7:** Note the remainder

**Step 8:** Do the above 2 steps for the quotient till the quotient is zero

**Step 9:** Write the remainders in the reverse order.

**Step 10:** The resultant is the required binary number.

## How to Convert Hexadecimal to Octal

Below are the steps on how to convert hexadecimal to octal number -

**Step 1:** Consider the given hexadecimal number

**Step 2:** First count the number of digits in the number

**Step 3:** If n is the position of the digit from the right end then multiply each digit with 16n-1

**Step 4:** Add the terms after multiplication

**Step 5:** Resultant is the equivalent decimal form

**Step 6:** Divide the decimal number with 8

**Step 7:** Note down the remainder

**Step 8:**Continue step 6 and 7 with the quotient, until the quotient is zero

**Step 9:** Write the remainders in reverse order

**Step 10:** The obtained number is the required result.