

DECIMAL TO BINARY, OCTAL AND HEXADECIMAL CONVERSION

Conversion of decimal to any number system of any base is a generalized method.


Let us directly move on to conversions.

Decimal to BINARY

All we have to do is just **divide the number by 2** and **write the remainder in adjacent column**. Then, **write all the remainder from bottom to top**. That is, it is the answer. Isn't that simple?

$$(35)_{10} = (?)_2$$

35	
17	1
8	1
4	0
2	0
1	0
0	1




$$(35)_{10} = (100011)_2$$

The procedure followed above remains the same for conversions to any base number system instead divide it with base of that number system.

Decimal to octal & hexadecimal

$$(35)_{10} = (?)_8$$

35	
4	3
0	4




$$\hat{A} (35)_{10} = (43)_8$$

$\hat{A} \hat{A}$

$$(35)_{10} = (?)_{16}$$

35	
2	3
0	2



$$\hat{A} (35)_{10} = (23)_{16}$$

\hat{A}

What if given number has fractional part? Just separate integer and fractional part, convert them separately and add them. E.g. - $(35.35)_{10}$ to $(?)_{16}$.

We have already found out conversion for integer part. Now we will find conversion for fractional part. It is quite different from integer part conversion.

Multiply the fractional part with the base (16 in our case). Separate out the integer part and again multiply only the fractional part with base. Continue the process until you get only integer or as many significant values you want.

Write the **separated integers from top to bottom.**

NOTE: The answer obtained for fractional part will be written after point (.) in system to which it is converted.

$(0.35)_{10}$

$0.35 \times 16 = 5.6$	Integer part 5	↓
$0.6 \times 16 = 9.6$	9	↓
$0.6 \times 16 = 9.6$	9	
$(0.35)_{10} = (0.599)_{16}$		

$(0.35)_{10} = (0.599)_{16}$

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So, our final answer is **$(35.35)_{10} = (23.599)_{16}$.**

Like I said before, the process of converting from decimal to number system of any base is a generalized process.

Source: <http://www.knowelectronics.org/decimal-to-binary-octal-hexadecimal-conversion/>