

Anybase to Decimal

- Number has two parts : integer and fraction
- interger - multiplication
- Fraction – division

If we have only interger for the conversion :

$$(254)_8 \rightarrow (?)_{10}$$

$$(254)_8$$

$$= (2 \times 8^2 + 5 \times 8^1 + 4 \times 8^0)_{10}$$

$$= (128 + 40 + 4)_{10}$$

$$= (172)_{10}$$

If we have only fraction for conversion :

$$(0.ABDF)_{16} \rightarrow (?)_{10}$$

$$(0.ABDF)_{16}$$

$$= (0 \times 16^0 + A \times 16^{-1} + B \times 16^{-2} + D \times 16^{-3} + F \times 16^{-4})_{10}$$

$$= (0 \times 1 + 10 \times 16^{-1} + 11 \times 16^{-2} + 13 \times 16^{-3} + 15 \times 16^{-4})_{10}$$

$$= (0 + 0.625 + 0.0429 + 0.0032 + 0.0002)_{10}$$

$$= (0.6713)_{10}$$

If we have both integer and fraction for the conversion :

$$(254.7014)_8 \rightarrow (?)_{10}$$

$$(254.7014)_8$$

$$= (2 \times 8^2 + 5 \times 8^1 + 4 \times 8^0 + 7 \times 8^{-1} + 0 \times 8^{-2} + 1 \times 8^{-3} + 4 \times 8^{-4})_{10}$$

$$= (128 + 40 + 4 + 0.875 + 0.0019 + 0.0009)_{10}$$

$$= (172.8778)_{10}$$

Decimal to Anybase

- Number has two parts : Interger and Fraction
- Interger - division
- Fraction - multiplication

If we have only interger for the conversion :

$$(1032)_{10} \rightarrow (2010)_8$$

| | |
|---|---------|
| 8 | 1032 |
| 8 | 129 , 0 |
| 8 | 16 , 1 |
| | 2 , 0 |

If we have only fraction for the conversion :

$$(.35)_{10} \rightarrow (.01011)_2$$

| | | | | |
|-------|-------|-------|-------|-------|
| .35 | .70 | .40 | .80 | .60 |
| x 2 | x 2 | x2 | x 2 | x2 |
| ----- | ----- | ----- | ----- | ----- |
| 0.70 | 1.40 | 0.8 | 1.60 | 1.2 |
| 0 | 1 | 0 | 1 | 1 |

If we have both integer and fraction for the conversion :

$$(172.878)_{10} \rightarrow (254.7014)_8$$

| | | | |
|-------|-------|-------|-------|
| .878 | .024 | .192 | .536 |
| x 8 | x 8 | x8 | x8 |
| ---- | ----- | ----- | ----- |
| 7.024 | 0.192 | 1.536 | 4.288 |

| | |
|---|--------|
| 8 | 172 |
| 8 | 21 , 4 |
| | 2 , 5 |

Another way through table

| | Real part | Fractional Part |
|------------------|-----------|-----------------|
| 0.878×8 | 7 | 0.024 |
| 0.024×8 | 0 | 0.192 |
| 0.192×8 | 1 | 0.536 |
| 0.536×8 | 4 | 0.288 |

Anybase to Anybase

Step 1 : Anybase to Decimal

Step 2 : Decimal to Anybase

Convert $(1056)_{16}$ to $(?)_8$

1. $(1056)_{16} \rightarrow (?)_{10}$

$$= 1 \times 16^3 + 0 \times 16^2 + 5 \times 16^1 + 6 \times 16^0$$

$$= 4096 + 0 + 80 + 6$$

$$= (4182)_{10}$$

2 $(4182)_{10} \rightarrow (?)_8$

| | | |
|---|------|---|
| 8 | 4182 | |
| 8 | 522 | 6 |
| 8 | 65 | 2 |
| 8 | 8 | 1 |
| | 1 | 0 |

$$= (10126)_8$$

Ans : $(1056)_{16} = (10126)_8$