Data representation in computer systems and its architecture and components
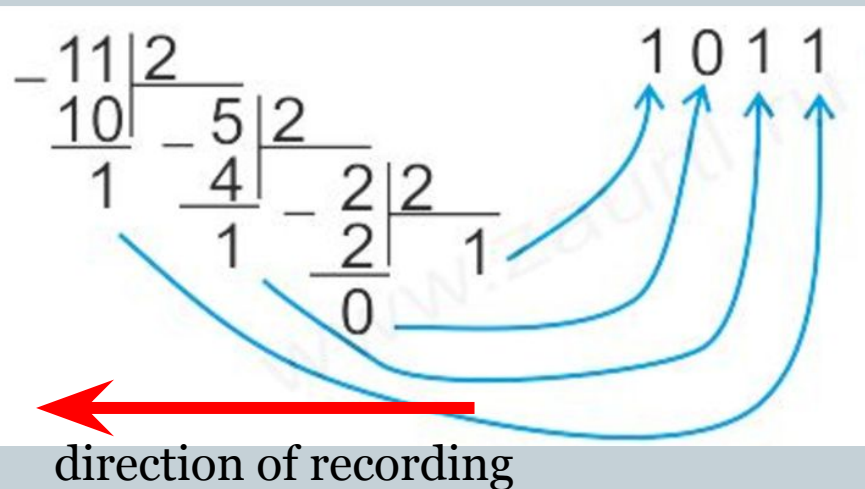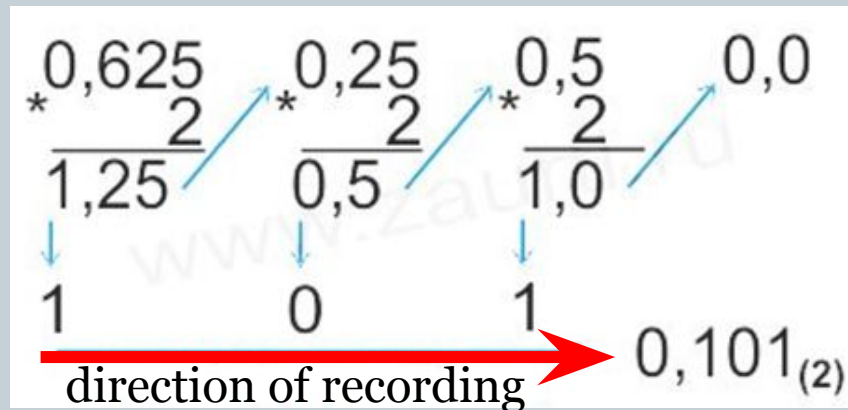
$11{,}625_{(10)} = \dots\dots\dots_{(2)}$

First step:

direction of recording

Second step:

direction of recording $\quad 0{,}101_{(2)}$

Answer: $11{,}625_{(10)} = 1011{,}101_{(2)}$

$$122,6_{(10)} = \ldots\ldots\ldots\ldots_{(8)}$$

First step:

direction of recording

Second step:

direction of recording

$$0,463_{(8)}$$

Answer: $122,6_{(10)} = 172,463\ldots_{(8)}$

$$500,7_{(10)} = \ldots\ldots\ldots_{(16)}$$

First step:

direction of recording

Second step:

direction of recording
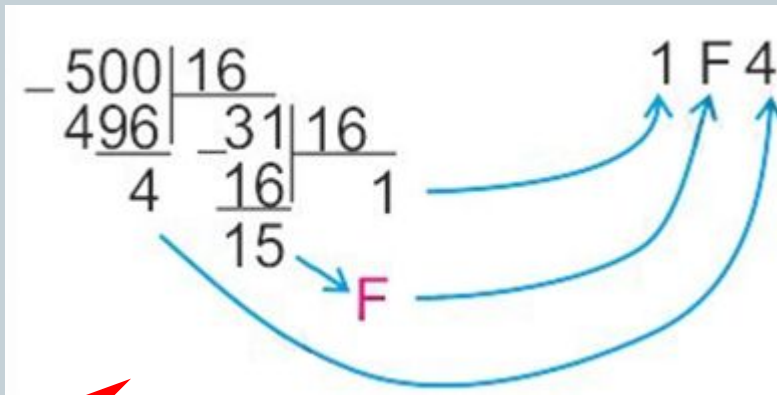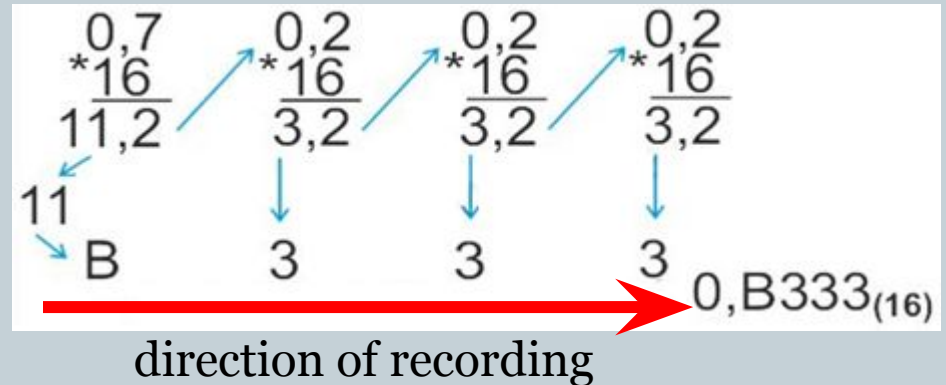
Answer: $500,7_{(10)} = 1F4,B333\ldots_{(16)}$

1. Converting binary to decimal

$$101,11_{(2)} \to (10) = 1*2^2 + 0*2^1 + 1*2^0 + 1*2^{-1} + 1*2^{-2} = 5,75_{(10)}$$

Answer: $101,11_{(2)} = 5,75_{(10)}$

2. Converting octal to decimal

$$57,24_{(8)} \to (10) = 5*8^1 + 7*8^0 + 2*8^{-1} + 4*8^{-2} = 47,3125_{(10)}$$

Answer: $57,24_{(8)} = 47,3125_{(10)}$

3. Converting hexadecimal to decimal

$$7A,84_{(16)} \to (10) = 7*16^1 + 10*16^0 + 8*16^{-1} + 4*16^{-2} = 122,515625_{(10)}$$

Answer: $7A,84_{(16)} = 122,515625_{(10)}$

Addition of two numbers in octal

$$\begin{array}{r} \overset{1}{}\overset{1}{} \\ 6\ 3\ 5\ 4_8 \\ +\ \ \ 7\ 0\ 5_8 \\ \hline 7\ 2\ 6\ 1_8 \end{array}$$

$4+5=9=1*8+1$
$5+0+1=6$
$3+7=10=1*8+2$
$6+1=7$

$$\begin{array}{r} 1\ \ 1\ \ 1 \\ 2\ 1\ 5,4 \\ +\ \ \ 7\ 3,6 \\ \hline 3\ 1\ 1,2 \end{array}$$

$4+6=10=8+2$
$5+3+1=9=8+1$
$1+7+1=9=8+1$
$2+1=3$

Answer: $6354_{(8)} + 705_{(8)} = 7261_{(8)}$ Answer: $215,4_{(8)} + 73,6_{(8)} = 311,2_{(8)}$

Addition of two numbers in hexadecimal

$$\begin{array}{r}
{\scriptstyle 1} \\
+ \quad 1\ C\ 5\ 2_{16} \\
8\ 9\ 1_{16} \\
\hline
2\ 4\ E\ 3_{16}
\end{array}$$

$1+2=3$

$5+9=14=E_{16}$

$C_{16}+8=12+8=20=1*16+4$

$1+1=2$

Answer: $1C52_{(16)} + 891_{(16)} = 24E3_{(16)}$

$$\begin{array}{r}
1\ 1 \\
+ \quad 8\ D,8 \\
3\ B,C \\
\hline
C\ 9,4
\end{array}$$

$8+12=20=16+4$

$13+11+1=25=16+9$

$8+3+1=12=C_{16}$

Answer: $8D,8_{(16)} + 3B,C_{(16)} = C9,4_{(16)}$