Assignment - 1

1. Convert 0.95 to its binary number System ?

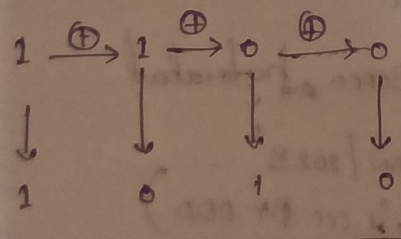
The Given number system is in ~~Binary~~ Decimal format to Convert into binary we use "fraction binary Conversion".

1. $0.95 \times 2 = 1.90 \rightarrow 1$
2. $0.90 \times 2 = 1.80 \rightarrow 1$
3. $0.80 \times 2 = 1.60 \rightarrow 1$
4. $0.60 \times 2 = 1.20 \rightarrow 1$
5. $0.20 \times 2 = 0.40 \rightarrow 0$
6. $0.40 \times 2 = 0.80 \rightarrow 0$
7. $0.80 \times 2 = 1.60 \rightarrow 1$
8. $0.60 \times 2 = 1.20 \rightarrow 1$

Again it was stepping from 7th Step so we Can Trunckat

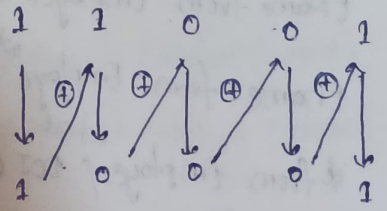
$$\text{Result } (0.95)_{10} = (1111.0.0)_2$$

3. Binary - Gray Code Conversion



Bin - Grey : 1 0 1 0

Gray to Binary Conversion.



Gray - Bin = 1 0 0 0 1

4. Representation of $(2.9)_{10}$ to Binary.

$(2.9)_{10} \rightarrow (x)_2$

2 | 2
1 - 0

$0.9 \times 2 = 1.8 - 1$
$0.8 \times 2 = 1.6 - 1$
$0.6 \times 2 = 1.2 - 1$
$0.2 \times 2 = 0.4 - 0$
$0.4 \times 2 = 0.8 - 0$ Truncated
$0.8 \times 2 = 1.6 - 1$

Result = $(10.11100)_2$

5. Representation of number Systems. (By padding Technique)

1. Binary - octal.

For octal we require 3 bits.

Given, $(10110.0011)_2 = (x)_8$

$x = (010110.001100)_2 = (26.14)_8$

2. Binary - Decimal.

$(10110.0011)_2 - (x)_{10}$

Σ digit $\times 2^{P.V}$

$x = (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) + (0 \times 2^{-1})$
$+ (0 \times 2^{-2}) + (1 \times 2^{-3}) + (1 \times 2^{-4})$

$x = (16 + 4 + 2 + 0.125 + 0.0625)$

$x = 22.1875$

$x = (22.1875)_{10}$

5. Binary to Hexadecimal

$(10110.0011)_2 = (x)_{16}$

$(0001\ 0110 . 0011\ 0000)_{16} = (x)_{16}$

$\boxed{(1\ 6 . 3)_{16}}$

6. Find the 16's Complement of $(FAB)_{16}$

By the formula 15's Complement + 1

15's Complement

F F F

F A B

0 5 4

$x = 054$

$x+1$

Result $= (055)_{16}$

7. Find the value of $(34)_8 - (21)_8$ using 8's Complement.

A $= (34)_8$

B $= (21)_8$

Step 1: Find the 8's Complement for B

8's C = 7's C + 1

7's C = 7 7

2 1

5 6

8's C = 56 + 1 = 57

Add 8's C to A

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  54
  34
1)13
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Carry indicates the sign it is +ve.

Result = $(34)_8 - (21)_8 = (13)_8$.

8. $(11001)_2 - (11011010)_2 = (x)_2$

A = 11001

B = 11011010

Since A has lesser no. of bits Compare to B, so we use 2's Complement method for subtraction [Convert into decimal]

A ⇒ 11001 : $1\times2^4 + 1\times2^3 + 0\times2^2 + 0\times2^1 + 1\times2^0 = 16+8+1 = (25)_{10}$

B ⇒ 11011010 : $1\times2^7 + 1\times2^6 + 0\times2^5 + 1\times2^4 + 1\times2^3 + 0\times2^2 + 1\times2^1 + 0\times2^0$

$= 128 + 64 + 0 + 16 + 8 + 0 + 2 + 0$

$= (218)_{10}$

decimal Subtraction

$(25)_{10} - (218)_{10} = -(193)_{10}$

Since the result is negative we must represent -193 in binary using 8's Complement

2 | 193

2 | 96 — 1

2 | 48 — 0

2 | 24 — 0

2 | 12 — 0

2 | 6 — 0

2 | 3 — 0

1 — 1

$\Rightarrow (11000001)_2$

By the 2's C

11000001

00111110

+ 1

00111111

8. $(11001)_2 - (11011010)_2 = (X)_2$

A = 00011001

B = 11011010

Binary Subtraction using 2's Complement

for B

00100101

+1

00100110 = C

Add C to A

00011001

00100110

00111111

Result : $(00111111)_2$

9. $(DEAD)_{16} + (beef)_{16} = (x)_8$.

Convert Hexadecimal to Binary & Binary to octal.

$(DEAD)_{16} = (1101\ 1110\ 1010\ 1101)_2$

$(BEEF)_{16} = (1011\ 1110\ 1110\ 1111)_2$

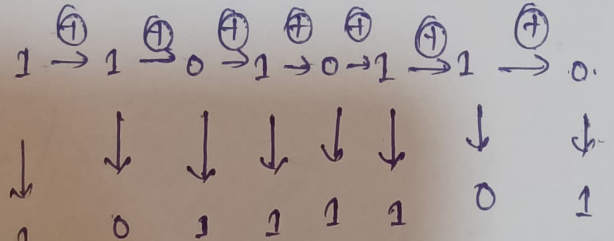
Binary to octal.

$(DEAD)_{16}$ to Octal $= 001\ 101\ 111\ 010\ 101\ 101 = (157255)_8$.

$(BEEF)_{16}$ to octal $= 001\ 011\ 111\ 011\ 101\ 111 = (137357)_8$.

$x = (81663 4)_8$.

10. Convert the binary $(11010110)_2$ to Gray Code.



Result $= (1011\ 1101)_2$

12. Represent the decimal number $(48)_{10}$ using the following weighted binary code 5311 ?

Represent Binary of 5311

$(48)_{10}$

4 = 0100

8 = 1100

$(48)_{10} = (0100\ 1100)_{5311}$

13. $(361849/147)_{10} = (57767)_x$ find x ?

$(361849/147)_{10} = (24573)_{10}$

$(24573)_{10} = (57767)_x$

Convert $(57767)_x$ to Decimal

$= 5b^4 + 7b^3 + 7b^2 + 6b^2 + 7b^0 = 24573$

$= b \simeq \sqrt[4]{24573} \simeq 10$

Base = 10

14. $(30165712)_8$ / $(147)_{10}$ Convert into Hexadecimal.

Convert Base 8 to Base 10.

$= 3\times8^8 + 0\times8^7 + 1\times8^6 + 6\times8^5 + 5\times8^4 + 7\times8^3 + 1\times8^2 + 1\times8^1 + 2\times8^0$

$= (50877866)_{10}$

By dividing

$\left(\frac{50877866}{147}\right)_{10} = (346426)_{10}$

Convert Base 10 - 16.

$(346726)_{10} = (54A66)_{16}$ = Result

15. The decimal number $(667)_{10}$ can be encoded into various 4-bit code as follows.

1. BCD (8421) : 0101 0110 0111
2. Excess-3 : 1000 1001 1010
3. Grey Code : 0111 0101 0100
4. 2421 Code : 0101 0110 0111

Q. Subtract $(1010100)_2 - (1010100)_2 = (x)_2$

Since A & B are same

So,
x is zero

Q. Find the decimal for BCD representation of (1101 1010 1100) BCD?

It is not possible to Convert into BCD.