Task. ASCII

Angelica Sanchez

Decimal

A = 65
n = 110
g = 103
e = 101
L = 108
i = 105
C = 99
a = 97

S = 83
a = 97
n = 110
c = 99
h = 104
e = 101
z = 122

Binary

A = 01000001
n = 01101110
g = 01100111
e = 01100101
l = 01101100
i = 01101001
C = 01100011
a = 01100001

S = 01010011
a = 01100001
n = 01101110
c = 01100011
h = 01101000
e = 01100101
z = 01111010

• Decimal to binary

$75 \longrightarrow \boxed{64 + 8 + 2 + 1}$

$75 - 64 = \boxed{11}$

$11 - 8 = \boxed{3}$

$3 - 2 = \boxed{1}$

1

$2^0 = 1$
$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$
$2^7 = 128$

2^9 2^{10} =

128	64	32	16	8	4	2	1
	1	0	0	1	0	1	1

1 = when we have the numbers

$\boxed{142} \longrightarrow \boxed{128 + 8 + 4 + 2}$

$= 10001110$

$142 - 128 = 14$
$14 - 8 = 6$
$6 - 4 = 2$
$2 - 2 = 0$

• Decimal to octal (8)

$394_{10} \longrightarrow = 612_8$

remainder.

$394 \div 8 = 49.25 = 49$ Re

$8 \times 0.25 = 2$

$49 \div 8 = 6.125$

$8 \times 0.125 = (1)$

$6 \div 8 = 0.76$

$0.76 \times 8 = 6$

49 R(2)
6 Re (1)
= 0 Re (6)

MSD — lsd.

• Decimal to Hexadecimal

4 9
↓ ↓
0-9 0-9
10 options

$16 + 10 = 16$

D	H
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

D	H
13	D
14	E
15	F

16 numbers

$479_{10} \longrightarrow 1DF_{16}$

$479 \div 16 = 29.9375$

divide by 16 → 29 R (15)

$16 \times 0.9375 = 15$

$29 \div 16 = 1.8125$

1 R (13)

$16 \times 0.8125 = 13$

$1 \div 16$ → 0 R (1)

$16 \times 0.0625 = 1$

Remainder: 1 13 15 (MSD → lsd)

1 D F

• Hexadecimal to Binary

A9 ⟶ Binary (groups of 4)

A = 10

9 = 8 4 2 1
2^3 2^2 2^1 2^0
1 0 0 1

10 = 8 4 2 1
1 0 1 0

A9 = 1010 1001

• Hexadecimal to octal.

$AC_{16} \longrightarrow$

A = 10
C = 12

① 10 12

② Binary

8	4	2	1	8	4	2	1
1	0	1	0	1	1	0	0

③ Groups of 3

010 101 100

010	101	100
4 2 1	4 2 1	4 2 1
↓	| |	↓
2	4+1	4
	= 5 ✗	

$AC_{16} \rightarrow 254_8$ ✗

- Ex. 2. $1EF_{16} \rightarrow oct. = 758$

$\begin{cases} 1 = 1 \\ E = 14 \\ F = 15 \end{cases}$

1	14	15
8 4 2 1	8 4 2 1	8 4 2 1
↓	↓	↓
0 0 0 1	1 1 1 0	1 1 1 1

→ Groups of 4 to groups of 3.

000	111	101	111
	4 2 1	4 2 1	4 2 1
	(4+2+1)	(4+1)	(4+2+1)
	↓	↓	↓
	7	5	7