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CSC28 – 01 22SU — 10 JULY 2022

1. convert 234(decimal) to binary

	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
	128	64	32	16	8	4	2	1
	1	1	1	0	1	0	1	0
234	106	42	10		2		0	

ANSWER: $2^7 + 2^6 + 2^5 + 2^3 + 2^1$

2. Two's complement for -12 using 8 bit then write in base 16.

12 ⟶ 0000 1100

1111 0011

\+ 1

1111 0100

F 4

3. Convert 5836 to base 8

	8^4	8^3	8^2	8^1	8^0
	4096	512	64	8	1
	1	3	3	1	4
5836	1740	204	12	4	0

ANSWER: $1(8^4) + 3(8^3) + 3(8^2) + 1(8^1) + 4(8^0)$

4. Convert 25.62 (dec) to binary

25 / 2 = 12.5	1	0.62 x 2 = 1.24	1	
12 / 2 = 6	0	0.24 x 2 = 0.48	0	
6 / 2 = 3	0	0.48 x 2 = 0.96	0	0.10011111101
3 / 2 = 1.5	1	0.96 x 2 = 1.92	1	$\cdot 2^{-1}+2^{-4}+2^{-5}+2^{-6}$
1 / 2 = 0.5	1	0.92 x 2 = 1.84	1	$+2^{-9}+2^{-9}+\ldots$
	11001	0.84 x 2 = 1.68	1	
$2^4+2^3+2^0$		0.68 x 2 = 1.36	1	
		0.36 x 2 = 0.72	0	
		0.72 x 2 = 1.44	1	
			↓	

ANSWER: $2^4+2^3+2^0 . 2^{-1}+2^{-4}+2^{-5}+2^{-6}+2^{-9}+2^{-9}+\ldots$

5. 8 bit float hex 35 ⟶ binary

35 ⟶ 0011 0101

0	011	0101

bias: $2^{3-1}-1 = 3$

exp: 3 - 3 = 0

$1.011 \times 2^0 = 1.011$

THE WEIRD WAY! (CORRECT ANSWER ACCORDING TO CANVAS)

0	101	0110

bias: 3

exp: 5 - 3 = 2

ANSWER: 1.0110×2^2

6. 8 bit float binary 11011111 ⟶ scientific notation

1	101	1111

bias = 3

exp: 5 - 3 = 2

ANSWER: -1.1111×10^2

THE WEIRD WAY! (CORRECT ANSWER ACCORDING TO CANVAS)

1	111	1011

bias: 3

exp: 7 - 3 = 4

ANSWER: -1.1011×10^4

7. $\left\lceil \frac{\text{\# of people}}{\text{\# of flights}} \right\rceil = \left\lceil \frac{n}{5} \right\rceil = 2$ $\quad n = 5(2-1)+1 = 6$ people

8. $50 - 4 = 46$

$C(46,6) = \frac{46!}{6!40!}$

9. 8 chairs : 2 red , 6 non-red

$C(46,6) \times C(4,2)$

$\frac{46!}{6!40!} \times \frac{4!}{2!2!}$

10. $C(50,4) - C(46,4)$

$= \frac{50!}{4!46!} - \frac{46!}{4!42!}$

11. 3 pair of pants

6 different shirts

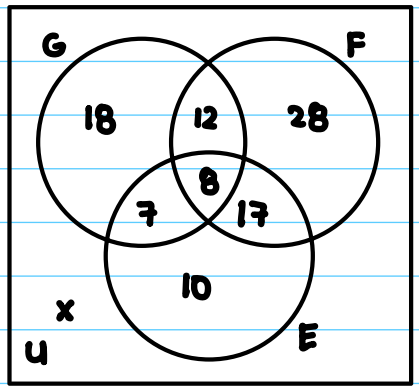
(a) $3 \times 6 = 18$

(b) $\left\lceil \frac{30}{18} \right\rceil = 2$ days

12. $5! \times 4! \times 3!$

13. $5! + 4! + 3!$

14. 155 people



$x = 155 - (G \cup F \cup E)$

$= 155 - 100$

$= 55$

15. Partition for set {red, blue, green, orange}
partitions doesn't intersect!

ANS: a,c,d

16. A = {1,2,3}
Equivalence relation:

- reflective: (1,1), (2,2), (3,3)
- symmetric: (1,2), (2,1)
- transitive: (1,2) and (2,1) ⟶ (1,1)