CSE260
Assignment 01

This assignment must be handwritten. Show ALL steps in ALL questions.

1. Subtract 132 from 547 in 11 bits using 2's complement number system and justify whether there is an overflow or not.

132 = 10000100	547 = 1000100011
+132 = 010000100	+547 = 01000100011
+132 in 11 bits = 00010000100	+547 in 11 bits = 01000100011
-132 in 11 bits = 11101111011	
+1	
_____	
11101111100	

01000100011

11101111100

_____

100110011111

Final result = 00110011111

NO overflow since we are adding 2 different signed numbers and we got the result as expected.

2. Convert the following from Excess 4 to the original number: $(101101100111.01011001)_{\text{Excess-4}}$

(101101100111.01011001)

1011 = 11, 0110 = 6, 0111 = 7, 0101 = 5, 1001 = 9

Subtracting 4 from each gives the original number = 723.15

3. Multiply the following in the given base: $(34)_9$ with $(87)_9$
   NB: You must show the whole procedure.

```
                87

                34

        _____

               381

              283

        _____

         3   3   2   1
```

4. Divide $(444)_7$ by $(25)_7$
   NB: You must show the whole procedure.

```
              25 ] 444 [ 15
                   25

              _____
                  164
                  164

              _____
                    0
```

5. You are a computer engineer and you want to buy two 8 GB DDR4 RAMs. Each RAM costs $(1C2)_{16}$ dollars. You also want to buy a graphics card RTX4070Ti which costs $(10010110000)_2$ dollars. However, you don't have that much money with you and you are afraid to ask your parents about it. Suddenly, one of your generous friends agreed to give you the money you need. He decided to give you $(4064)_8$ dollars. How much will you have left after buying those components? (Show the answer in decimal)

Ram Cost $= (1C2)_{16}$

$1C2 = 1 \times 16^2 + 12(C) \times 16^1 + 2 \times 16^0 = (450)_{10}$

Graphics card cost $= (10010110000)_2$

$= 1 \times 2^{10} + 0 \times 2^9 + 0 \times 2^8 + 1 \times 2^7 + 0 \times 2^6 + 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2 + 0 \times 2^0$

$(10010110000)_2 = (1200)_{10}$

Total Cost $= 450 \times 2 + 1200$

$= 2100$

I got $= (4064)_8$

$(4064)_8 = 4 \times 8^3 + 0 \times 8^2 + 6 \times 8^1 + 4 \times 8^0$

$= (2100)_{10}$

Remaining $= (2100 - 2100)_{10} = (0)_{10}$ dollars