

Planning :

2331

$\cdot 85 \times + 2 = 17$   
 17

8 bit bin  $\rightarrow$  single sig

+41	0	101001
-41	1	101001

sing magnitude

1's complement from

+41	0	101001
-41	1	01001
		opposit
	1	010110

sign

---

2's complement

+41	0	101001
-41	1	0101001
		1010110
		+1
		1010111

01001100

0 → plus  
1 → Negat

0	1	0	0	1	1	0	0
$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$

64 + 8 + 4 + = 76

Signed Mag

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

-47

1	0	1	0	0	0	0	0
$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$

64 + 16 ⇒ -80

+1

		1	0	1	0	0	1
		$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^0$

64 + 16 + 1 ⇒ -81



# Floating Point

$$22 \rightarrow 0.22 \times 2 \rightarrow 0.44$$

$$0.44 \times 2 \rightarrow 0.88$$

$$\frac{01001100}{S+3=-2 \quad m^2}$$

bit to dec

$$\begin{array}{l} 100 \\ \downarrow \\ 2^0 \times 0.2 \\ \downarrow \\ 2^1 \times 0.4 \\ \downarrow \\ 2^2 \times 1 = 4 \end{array}$$

$$0.011100$$

$$0.011100$$

$$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{8} \times \frac{1}{16} = 0.4375$$

$$\text{Bias} = 2^{(n-1)-1}$$

$$\text{Value} = (-1)^S \times 2^{\text{Exponent}} \times M$$

$$\frac{00010110}{3^{-1}}$$

$$\Rightarrow 1 \times 2^2 \times 0.75$$

00010110  
S E M

formula  $2(-1)^S \times 2^{E_{dec}} \times M$

for  $E = 001 \xrightarrow{dec} 1$

$(2^{3-1})$  Expt  $\Rightarrow 1-3 = -2$

M

1.0110  
 $0 \times 2^0 = 0$   
 $1 \times 2^{-1} = 0.5$   
 $1 \times 2^{-2} = 0.25$   
 $1 \times 2^{-4} = 0.0625$

01101

$0 \times 2^0 = 1$   
 $0 \times 2^{-1} = 0$   
 $1 \times 2^{-2} = 0.25$   
 $1 \times 2^{-3} = 0.125$

M 0.8125

$\Rightarrow 1.375$

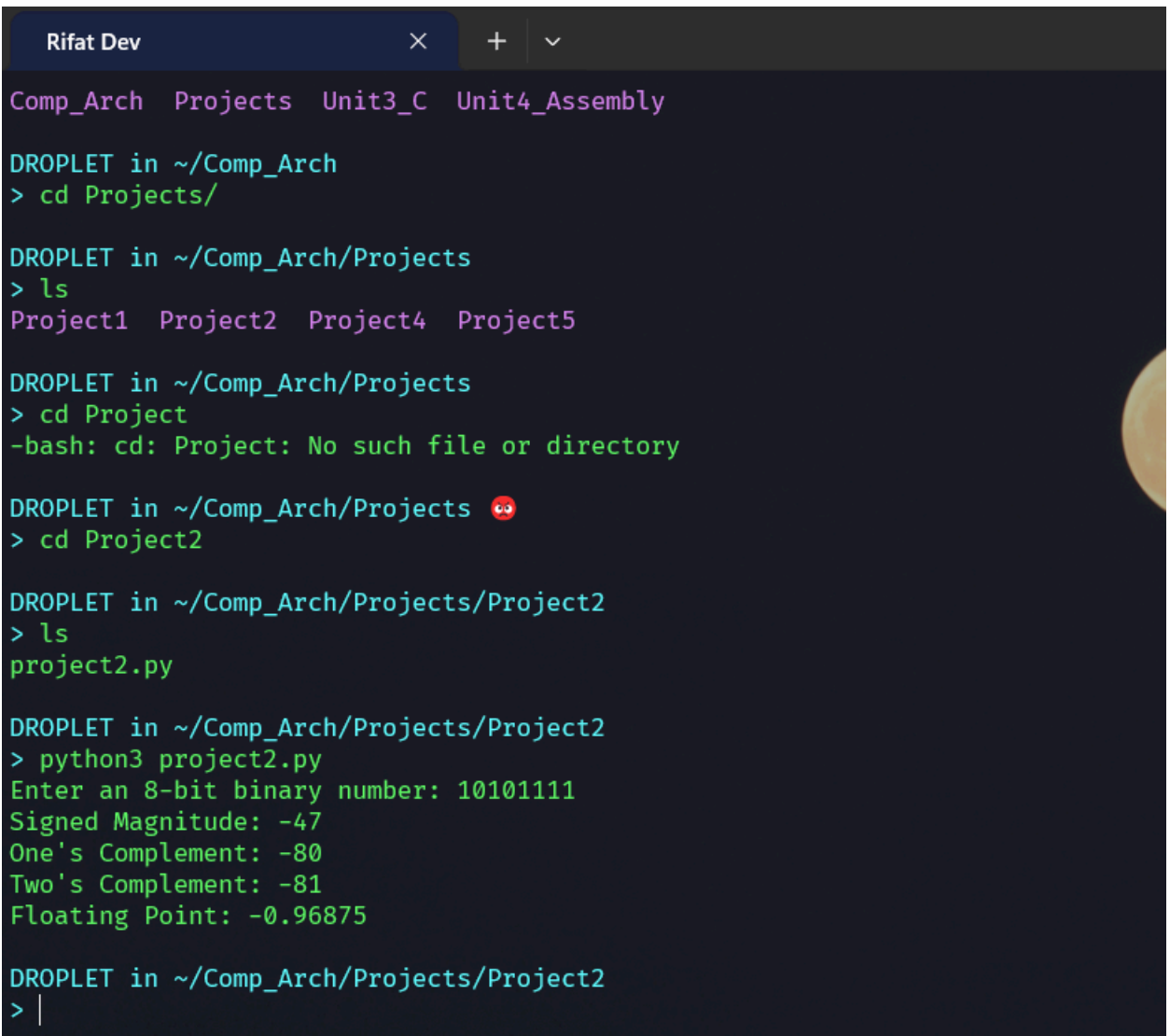
$M \times 2^{Expt} = 0.8125 \times 2^{-2} = 0.203125$



Follow up question:

- 1) I don't have a partner.
- 2) 5 hours. Actually, my concept was not clear. So I spend more time to re-watch all the Class again and clear the concept.
- 3) The hardest part of the assignment is converting bits to decimals. But I was checking how to do that I found a cool function `int()`. that makes it so easy.
- 4) I learn a lot of things. How to convert numbers. My binary concept is more clear now.
- 5) I relied more on YouTube than ChatGPT for this assignment because I wanted to strengthen my foundational knowledge. If you review my preliminary work, you'll see that I performed the math conversions by hand.

Extension:



```
Rifat Dev X + v
Comp_Arch Projects Unit3_C Unit4_Assembly

DROPLET in ~/Comp_Arch
> cd Projects/

DROPLET in ~/Comp_Arch/Projects
> ls
Project1 Project2 Project4 Project5

DROPLET in ~/Comp_Arch/Projects
> cd Project
-bash: cd: Project: No such file or directory

DROPLET in ~/Comp_Arch/Projects
> cd Project2

DROPLET in ~/Comp_Arch/Projects/Project2
> ls
project2.py

DROPLET in ~/Comp_Arch/Projects/Project2
> python3 project2.py
Enter an 8-bit binary number: 10101111
Signed Magnitude: -47
One's Complement: -80
Two's Complement: -81
Floating Point: -0.96875

DROPLET in ~/Comp_Arch/Projects/Project2
> |
```