

2331

$85 \times 2 = 170$
17

8 bit bin \rightarrow single sig.

+41	0	101001
-41	1	101001

sig magnitude

1's complement from

+41	0	101001
-41	1	01001
		opposite
		1's
		sign

~~+41 011011~~

2's complement

+41 0101001

-41 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
2^6	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	2^1

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

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

M

0.8125

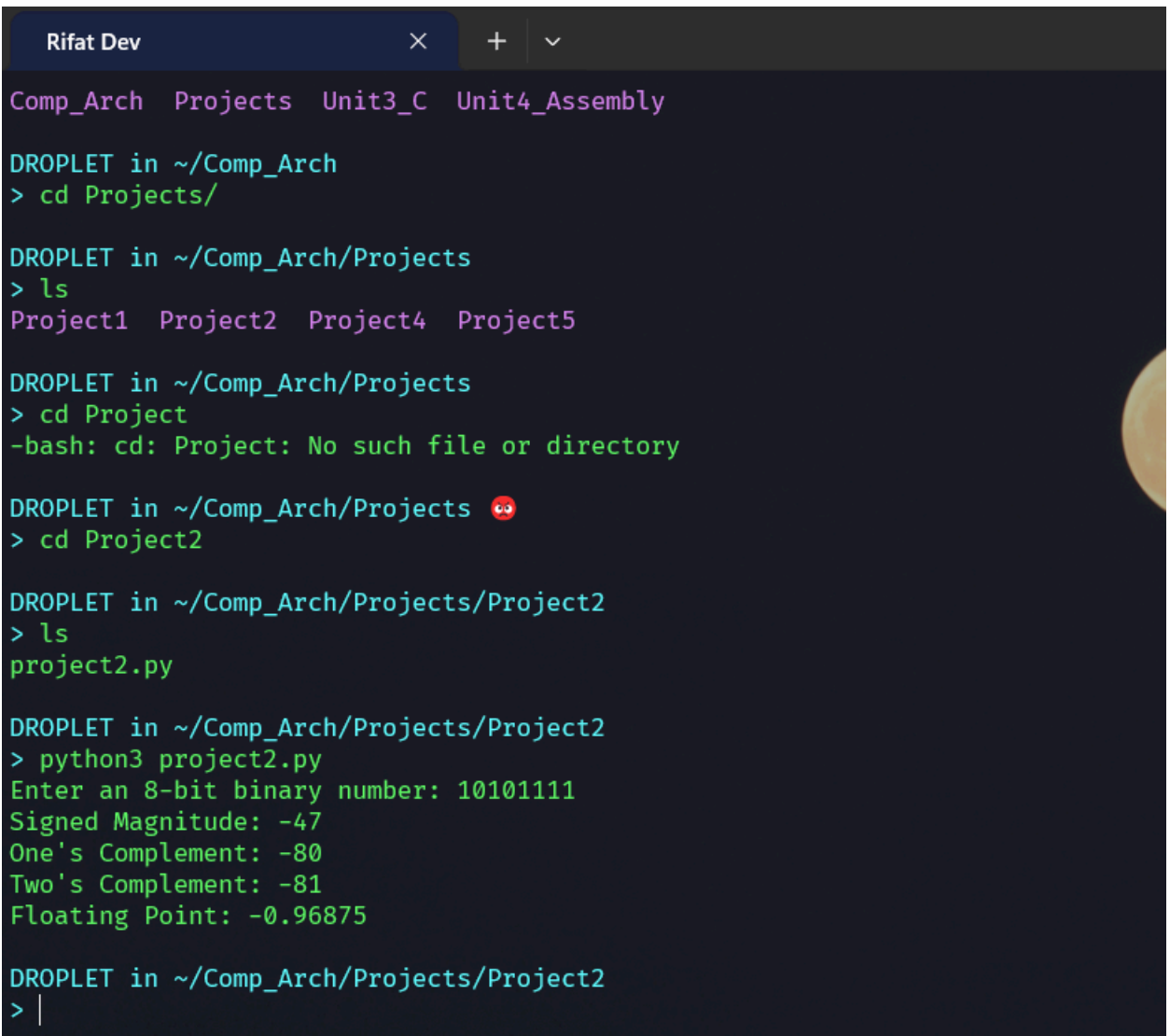
$\Rightarrow 1.375$

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

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 × + 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
> |
```