Programming Assignment: Morse Code

Objective:

To design programs that encode English text into Morse Code and decode Morse Code back into readable text using programming logic and data structures.

Rules:

- Use Java programming language

- No built-in Morse libraries allowed.

- Use proper input validation.

- Code must be well-commented.

Level 1: Basic Programs

Q1. Morse Code Encoder

Write a program that takes a single alphabet character as input and prints its corresponding Morse Code.

Example:

Input: A

Output: ▪▬

Q2. Morse Code Decoder

Write a program that takes a single Morse Code symbol as input and prints the corresponding alphabet.

Example:

Input: ▪▪▪

Output: S

Level 2: String Handling

Q3. Word to Morse Code

Accept a word from the user and convert it into Morse Code.

Example:

Input: **HELLO**

Output: ▪▪▪▪ ▪ ▪ ▬ ▪▪ ▪ ▬ ▪▪ ▬ ▬ ▬

Q4. Morse Code to Word

Accept Morse Code where letters are separated by spaces and convert it back into text.

Example:

Input: ▪▪ ▬ ▪ ▬ ▪▪ ▪▪ ▪ ▬

Output: **INDIA**

Level 3: Sentence Conversion

Q5. Sentence to Morse Code

Accept a full sentence and convert it to Morse Code. Use / to separate words.

Example:

Input: **SAVE INDIA**

Output: ▪▪▪ ▪ ▬ ▪▪▪ ▬ ▪ / ▪▪ ▬ ▪ ▬ ▪▪ ▪▪ ▪ ▬

Q6. Morse Code to Sentence

Decode a Morse Code sentence where words are separated using /.

Level 4: Menu-Driven Program

Q7. Morse Code Converter System

Create a menu-driven program with options:

1. Text to Morse Code

2. Morse Code to Text

3. Exit

Level 5: Advanced

Q8. Frequency Counter

Convert a sentence into Morse Code and count the number of dots and dashes.

Q9. File Handling

Read text from a file, convert it into Morse Code, and save it into another file.

Bonus Challenge

Q10. Bi-Directional Converter

Design a program that automatically detects whether input is text or Morse Code and converts it accordingly.

International Morse Code

A ·—	N —·	1 ·————	. ·—·—·—	= —···—
B —···	O ———	2 ··———	, ——··——	+ ·—·—·
C —·—·	P ·——·	3 ···——	? ··——··	- —····—
D —··	Q ——·—	4 ····—	! —·—·——	$ ···—··—
E ·	R ·—·	5 ·····	' ·————·	@ ·——·—·
F ··—·	S ···	6 —····	" ·—··—·	
G ——·	T —	7 ——···	(—·——·—	
H ····	U ··—	8 ———··	) —·——·—·	
I ··	V ···—	9 ————·	& ·—···	
J ·———	W ·——	0 —————	: ———···	
K —·—	X —··—		; —·—·—·	
L ·—··	Y —·——		/ —··—·	
M ——	Z ——··		_ ··——·—	

SOS ···———···	Break —··· —·—
New Line ·—·—	Closing —·—· ·—··
New Page ·—·—·	Shift to Wabun code —··———
New Paragraph —···—	End of contact ···
Attention —·—·—	Understood ···—·
Error ·········	Invitation for named station to transmit —·——·
Wait ·—···	Invitation for any station to transmit —·—