

**Aim:** Create a simple Java program to encode and decode text using a shift-based cipher (similar to a Caesar cipher). This will help you practice using loops, conditionals, and basic string manipulation in Java.

**Source Code:**

```
import java.util.Scanner;

public class BasicTextEncoderDecoder {

    // Method to encode the message
    public static String encode(String message, int shift) {
        StringBuilder encoded = new StringBuilder();

        for (char ch : message.toCharArray()) {
            if (Character.isUpperCase(ch)) {
                // Shift uppercase letter
                char shifted = (char) ((ch - 'A' + shift) % 26 + 'A');
                encoded.append(shifted);
            } else if (Character.isLowerCase(ch)) {
                // Shift lowercase letter
                char shifted = (char) ((ch - 'a' + shift) % 26 + 'a');
                encoded.append(shifted);
            } else {
                // Keep non-alphabet characters unchanged
                encoded.append(ch);
            }
        }

        return encoded.toString();
    }

    // Method to decode the message
    public static String decode(String message, int shift) {
        // Decoding is just encoding with reverse shift
        return encode(message, 26 - (shift % 26));
    }

    // Display the menu options
    public static void displayMenu() {
        System.out.println("\n==== Text Encoder & Decoder ====");
        System.out.println("1. Encode a message");
        System.out.println("2. Decode a message");
        System.out.println("3. Reset shift number");
        System.out.println("4. Exit");
        System.out.print("Enter your choice: ");
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int shift;
```

```

// Ask for initial shift value
System.out.print("Enter shift number (positive integer): ");
while (!scanner.hasNextInt() || (shift = scanner.nextInt()) < 0) {
    System.out.print("Invalid input. Enter a positive integer: ");
    scanner.next(); // clear invalid input
}

scanner.nextLine(); // consume leftover newline
boolean running = true;

while (running) {
    displayMenu();
    String choice = scanner.nextLine();

    switch (choice) {
        case "1": // Encode
            System.out.print("Enter message to encode: ");
            String encodeMsg = scanner.nextLine();
            String encoded = encode(encodeMsg, shift);
            System.out.println("Encoded Message: " + encoded);
            break;

        case "2": // Decode
            System.out.print("Enter message to decode: ");
            String decodeMsg = scanner.nextLine();
            String decoded = decode(decodeMsg, shift);
            System.out.println("Decoded Message: " + decoded);
            break;

        case "3": // Reset shift
            System.out.print("Enter new shift number: ");
            while (!scanner.hasNextInt() || (shift = scanner.nextInt()) < 0) {
                System.out.print("Invalid input. Enter a positive integer: ");
                scanner.next(); // clear invalid input
            }
            scanner.nextLine(); // consume newline
            System.out.println("Shift updated to: " + shift);
            break;

        case "4": // Exit
            running = false;
            System.out.println("Exiting program. Goodbye!");
            break;

        default:
            System.out.println("Invalid option. Please select 1-4.");
            break;
    }
}

scanner.close();

```

```
}  
}
```

### Output:

```
D:\>javac BasicTextEncoderDecoder.java
```

```
D:\>java BasicTextEncoderDecoder  
Enter shift number (positive integer): 2
```

```
==== Text Encoder & Decoder ====
```

1. Encode a message
2. Decode a message
3. Reset shift number
4. Exit

```
Enter your choice: 1
```

```
Enter message to encode: hello voc
```

```
Encoded Message: jgnnq xqe
```

```
==== Text Encoder & Decoder ====
```

1. Encode a message
2. Decode a message
3. Reset shift number
4. Exit

```
Enter your choice: 2
```

```
Enter message to decode: jgnnq xqe
```

```
Decoded Message: hello voc
```

```
==== Text Encoder & Decoder ====
```

1. Encode a message
2. Decode a message
3. Reset shift number
4. Exit

```
Enter your choice: 3
```

```
Enter new shift number: 5
```

```
Shift updated to: 5
```

```
==== Text Encoder & Decoder ====
```

1. Encode a message
2. Decode a message
3. Reset shift number
4. Exit

```
Enter your choice: 1
```

```
Enter message to encode: hello voc
```

```
Encoded Message: mjqqt ath
```

```
==== Text Encoder & Decoder ====
```

1. Encode a message
2. Decode a message
3. Reset shift number
4. Exit

Enter your choice: 2

Enter message to decode: mjqqt ath

Decoded Message: hello voc

==== Text Encoder & Decoder ====

1. Encode a message

2. Decode a message

3. Reset shift number

4. Exit

Enter your choice: 4

Exiting program. Goodbye!