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Assignment Code:

```
import java.util.Scanner;

public class Main {

   // Shifts a single character by the given amount (Caesar-style shift)
   private static char ShiftChar(char ch, int shift) {

      // Uppercase A–Z
      if (ch >= 'A' && ch <= 'Z') {
         int base = 'A';
         int offset = ch - base;
         int newOffset = (offset + shift + 26) % 26;   // wrap-around
         return (char) (base + newOffset);
      }

      // Lowercase a–z
      else if (ch >= 'a' && ch <= 'z') {
         int base = 'a';
         int offset = ch - base;
         int newOffset = (offset + shift + 26) % 26;   // wrap-around
         return (char) (base + newOffset);
      }

      // Non-alphabetic characters remain unchanged
      return ch;
   }

   // Applies shifting to each character in the string
   private static String TextShift(String text, int shift) {
      shift = shift % 26;  // normalize shift
      StringBuilder result = new StringBuilder();

      for (char ch : text.toCharArray()) {
         result.append(ShiftChar(ch, shift));
      }
      return result.toString();
   }

   // Reads a valid shift value from the user
   private static int readShift(Scanner sc) {
      while (true) {
         System.out.println("Enter Shift number (example: 1, 2, 3, 4, 5):");

         if (sc.hasNextInt()) {
            int s = sc.nextInt();
            sc.nextLine(); // clear buffer
            return s;
         }

         System.out.println("Invalid input. Please enter a number.");
         sc.nextLine(); // clear invalid input
      }
```

```
    }

    // Displays the main menu
    private static void printMenu() {
        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. Change shift number");
        System.out.println("4. Exit");
        System.out.print("Choose an option (1–4): ");
    }

    // Encodes text using positive shift
    public static String encode(String text, int shift) {
        return TextShift(text, shift);
    }

    // Decodes text by reversing the shift
    public static String decode(String text, int shift) {
        return TextShift(text, -shift);
    }

    public static void main(String[] args) {
        /*
        *  System.out.println("Hello, World !");
//      char abc = ShiftChar('A',2);
//      System.out.println(abc);
//      String abc = TextShift("Hello",2);
//      System.out.println(abc);
        *
        * */

        Scanner sc = new Scanner(System.in);
        System.out.println("Welcome to the Encode–Decode Program!");

        int shift = readShift(sc);
        boolean running = true;

        while (running) {
            printMenu();
            String choice = sc.nextLine().trim();

            switch (choice) {

                case "1":
                    System.out.println("Enter message to encode:");
                    String toEncode = sc.nextLine();
                    System.out.println("Encoded Message: " + encode(toEncode, shift));
                    break;

                case "2":
                    System.out.println("Enter message to decode:");
                    String toDecode = sc.nextLine();
                    System.out.println("Decoded Message: " + decode(toDecode, shift));
                    break;

                case "3":
```

```
                shift = readShift(sc);
                System.out.println("Shift updated to: " + shift);
                break;

            case "4":
                System.out.println("Bye Bye!");
                running = false;
                break;

            default:
                System.out.println("Invalid choice. Please choose between 1 and 4.");
        }
      }

      sc.close();
   }
}

/*
*
* Output
*
*
* "C:\Program Files\Eclipse Adoptium\jdk-21.0.9.10-hotspot\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition 2025.2.4\lib\idea_rt.jar=61628" -Dfile.encoding=UTF-
8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath
C:\Users\bappi\OneDrive\Desktop\Emergency\java\Vaults_of_Codes_Encode_Decode\out\productio
n\Vaults_of_Codes_Encode_Decode Main
Welcome to encode decode program !
Enter Shift number(example = 1,2,3,4,5):
3

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
Choose an option (1-4): 1
Enter message to enter:
Hello World
Encoded Message:Khoor Zruog

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
Choose an option (1-4): 2
Enter a message  to decode:

Decoded message:

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
```

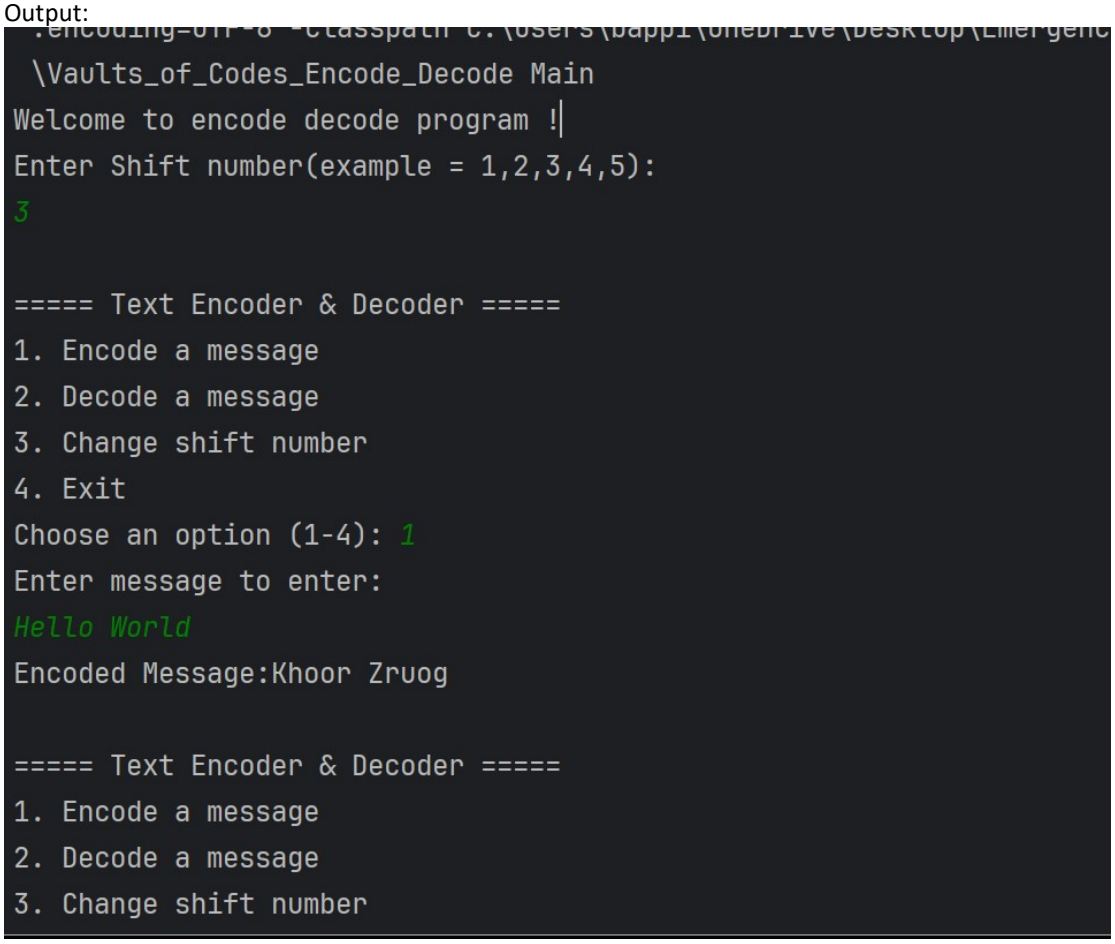
Choose an option (1-4): 2
Enter a message to decode:
Khoor Zruog
Decoded message:Hello World

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
Choose an option (1-4): 4
Bye Bye !

Process finished with exit code 0

* */

Output:

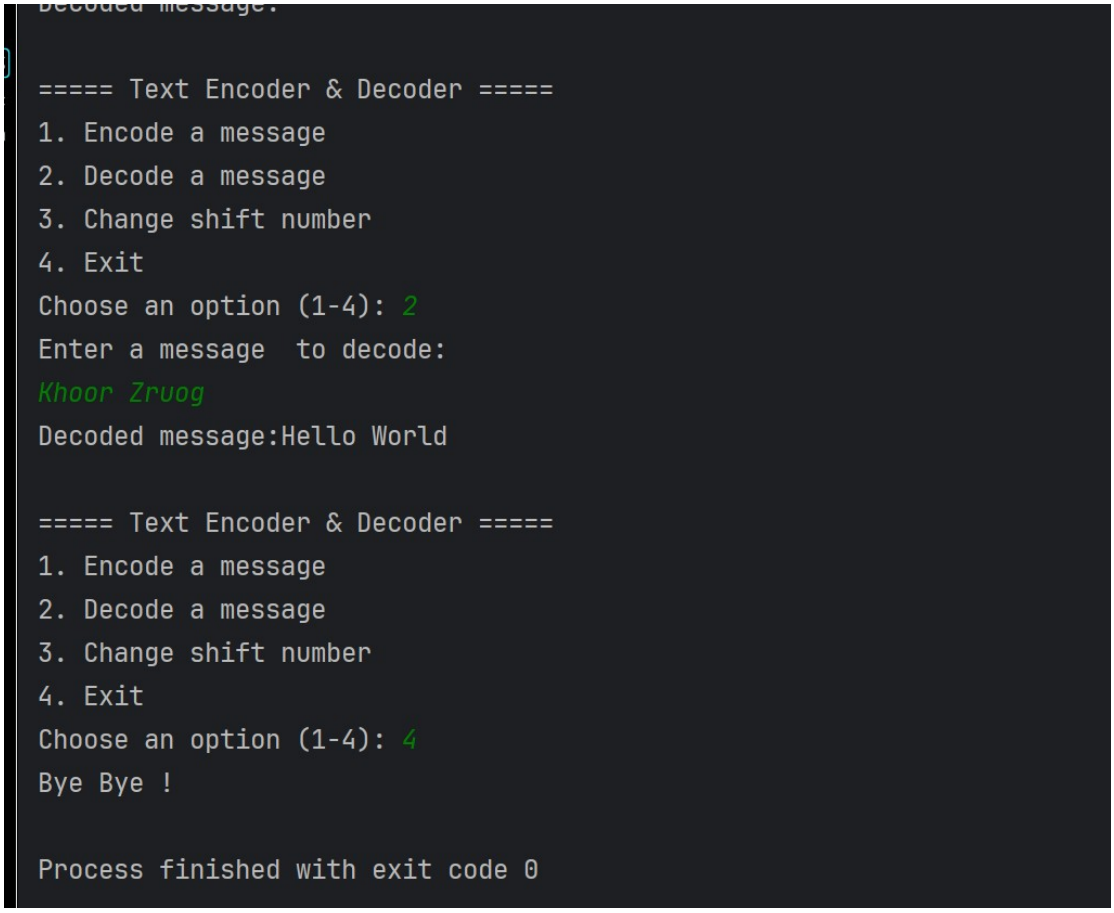


```
Hello World
Encoded Message:Khoor Zruog

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
Choose an option (1-4): 2
Enter a message  to decode:

Decoded message:

===== Text Encoder & Decoder =====
1. Encode a message
2. Decode a message
3. Change shift number
4. Exit
Choose an option (1-4): 2
Enter a message  to decode:
Khoor Zruog
Decoded message:Hello World
```



Github Link:https://github.com/SinghBappi/Vault_of_Codes_Internship_Java
Linkedin Post Link:https://www.linkedin.com/posts/bappi-singh-13a15a33b_github-singhbappivaultofcodesinternshipjava-activity-7395002906296459264-KDCo?utm_source=share&utm_medium=member_desktop&rcm=ACoAAFVGFT4Bv4f_Rebye2FBbgS7mURboFtvBcA