Experiment 1

Aim: Write a C/C++/Java program to implement Ceaser and Mono Alphabetic Cipher.

Tools: gcc, Visual Studio Code

Code:

1. Ceaser Cipher:

```c
#include <stdio.h>
#include <string.h>

void encrypt(int key, char* encryption, char* message) {
    int len = strlen(message);
    char tmp, i;
    for (i = 0; i < len; i++) {
        if (message[i] >= 'A' && message[i] <= 'Z') {
            tmp = message[i] + key;
            if (tmp > 'Z')
                encryption[i] = tmp - 26;
            else
                encryption[i] = tmp;
        }
        else
            encryption[i] = message[i];
    }
    encryption[i] = 0;
}

void decrypt(int key, char* decryption, char* message) {
    int len = strlen(message);
    char tmp, i;
    for (i = 0; i < len; i++) {
        if (message[i] >= 'A' && message[i] <= 'Z') {
            tmp = message[i] - key;
            if (tmp < 'A')
                decryption[i] = tmp + 26;
            else
                decryption[i] = tmp;
        }
        else
            decryption[i] = message[i];
    }
    decryption[i] = 0;
}
```

```c
int main() {
    int key, choice;
    char message[256], encryption[256], decryption[256], ch;

    printf("Enter key for Ceaser Cipher (1-25): ");
    scanf("%d", &key);

    if (key < 1 || key > 25) {
        printf("Enter key between 1 to 25.\n");
        return 1;
    }

    while (1) {
        printf("\n1) Encryption\n2) Decryption\n3) Exit\nEnter Following Choice: ")
;
        scanf("%d", &choice);

        getchar();
        if (choice == 3)
            break;
        else if (choice == 1) {
            printf("Enter message for encryption: ");
            scanf("%[^\n]s", message);

            encrypt(key, encryption, message);
            printf("Plain Text: %s\nCipher Text: %s\n", message, encryption);
        }
        else if (choice == 2) {
            printf("Enter message for deryption: ");
            scanf("%[^\n]s", message);

            decrypt(key, decryption, message);
            printf("Cipher Text: %s\nPlain Text: %s\n", message, decryption);
        }
        else
            printf("Enter valid choice.\n");
    }

    return 0;
}
```

2. Affine Cipher:

```c
#include<stdio.h>
#include<string.h>

void encrypt(int key1, int key2, char* encryption, char* message) {
    int len = strlen(message), i;
    char tmp;
```

```c
    for (i = 0; i < len; i++) {
        if (message[i] >= 'A' && message[i] <= 'Z') {
            tmp = (key1 * (message[i] - 'A') + key2) % 26;
            encryption[i] = 'A' + tmp;
        }
        else
            encryption[i] = message[i];
    }
    encryption[i] = 0;
}

void decrypt(int key1, int key2, char* decryption, char* message) {
    int len = strlen(message), tmp, i, key1prime;
    for (i = 0; i < 26; i++)
        if ((key1 * i) % 26 == 1) {
            key1prime = i;
            break;
        }
    for (i = 0; i < len; i++) {
        if (message[i] >= 'A' && message[i] <= 'Z') {
            tmp = (key1prime * (message[i] + 'A' - key2)) % 26;
            decryption[i] = 'A' + tmp;
        }
        else
            decryption[i] = message[i];
    }
    decryption[i] = 0;
}

int main() {
    int key1, key2, choice;
    char message[256], encryption[256], decryption[256], ch;

    printf("Enter two keys for Affine Cipher: ");
    scanf("%d %d", &key1, &key2);

    while (1) {
        printf("\n1) Encryption\n2) Decryption\n3) Exit\nEnter Following Choice: ")
;
        scanf("%d", &choice);
        getchar();

        if (choice == 3)
            break;
        else if (choice == 1) {
            printf("Enter message for encryption: ");
            scanf("%[^\n]s", message);
```

```c
        encrypt(key1, key2, encryption, message);
        printf("Plain Text: %s\nCipher Text: %s\n\n", message, encryption);
    }
    else if (choice == 2) {
        printf("Enter message for deryption: ");
        scanf("%[^\n]s", message);

        decrypt(key1, key2, decryption, message);
        printf("Cipher Text: %s\nPlain Text: %s\n\n", message, decryption);
    }
    else
        printf("Enter valid choice.\n");

    }

    return 0;
}
```

Output:

```
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ gcc CeaserCipher.c -o cc
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ ./cc
Enter key for Ceaser Cipher (1-25): 0
Enter key between 1 to 25.
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ ./cc
Enter key for Ceaser Cipher (1-25): 26
Enter key between 1 to 25.
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ ./cc
Enter key for Ceaser Cipher (1-25): 16

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 1
Enter message for encryption: JAYMITHADIYA
Plain Text: JAYMITHADIYA
Cipher Text: ZQOCYJXQTYOQ

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 2
Enter message for deryption: ZQOCYJXQTYOQ
Cipher Text: ZQOCYJXQTYOQ
Plain Text: JAYMITHADIYA

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 3
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$
```

Img 1.1: Ceaser Cipher

```
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ gcc AffineCipher.c -o ac
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ ./ac
Enter two keys for Affine Cipher: 5 9

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 1
Enter message for encryption: JAYMITHADIYA
Plain Text: JAYMITHADIYA
Cipher Text: CJZRXASJYXZJ

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 2
Enter message for deryption: CJZRXASJYXZJ
Cipher Text: CJZRXASJYXZJ
Plain Text: JAYMITHADIYA

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 3
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$ ./ac
Enter two keys for Affine Cipher: 9 5

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 1
Enter message for encryption: JAYMITHADIYA
Plain Text: JAYMITHADIYA
Cipher Text: IFNJZUQFGZNF

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 2
Enter message for deryption: IFNJZUQFGZNF
Cipher Text: IFNJZUQFGZNF
Plain Text: JAYMITHADIYA

1) Encryption
2) Decryption
3) Exit
Enter Following Choice: 3
IT075-JayMithadiya@DESKTOP-L7QAUFL:/mnt/e/IT075_7/ECES/Lab1$
```

Img 1.2: Affine Cipher