Experiment No. 5

Write A Program To Implement Caesar Cipher

I. Minimum Theoretical Background

The Caesar Cipher technique is one of the earliest and simplest method of encryption technique. It’s simply a type of substitution cipher, i.e., each letter of a given text is replaced by a letter some fixed number of positions down the alphabet.

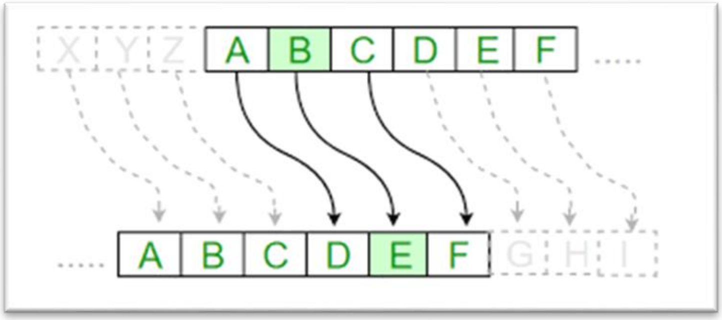
For example with a shift of 1, A would be replaced by B, B would become C, and so on. The method is apparently named after Julius Caesar, who apparently used it to communicate with his officials.

Thus to cipher a given text we need an integer value, known as shift which indicates the number of position each letter of the text has been moved down.
The encryption can be represented using modular arithmetic by first transforming the letters into numbers, according to the scheme,

A = 0, B = 1,…, Z = 25. Encryption of a letter by a shift n can be described mathematically as.

E_n(x)=(x+n)mod\26
(Encryption Phase with shift n)

D_n(x)=(x-n)mod\26
(Decryption Phase with shift n)



II. Procedure

Algorithm for Caesar Cipher:
Input:

1. A String of lower case letters, called Text.
2. An Integer between 0-25 denoting the required shift.

Procedure:

- Traverse the given text one character at a time .
- For each character, transform the given character as per the rule, depending on whether we’re encrypting or decrypting the text.
- Return the new string generated.

1.C Program:
Encryption

```
#include<stdio.h>

int main()
{
char message[100], ch;
int i, key;
printf("Enter a message to encrypt: ");
gets(message);
printf("Enter key: ");
scanf("%d", &key);
for(i = 0; message[i] != '\0'; ++i){
ch = message[i];
if(ch >= 'a' && ch <= 'z'){
ch = ch + key;
if(ch > 'z'){
ch = ch - 'z' + 'a' - 1;
}
message[i] = ch;
}
else if(ch >= 'A' && ch <= 'Z'){
ch = ch + key;
if(ch > 'Z'){
ch = ch - 'Z' + 'A' - 1;
}
message[i] = ch;
}
}
printf("Encrypted message: %s", message);
return 0;
}
```

Output:

```
Enter a message to encrypt: axzd
Enter key: 4
Encrypted message: ebdh
```

2.C Program:

Decryption

```
#include<stdio.h>

int main()
{
char message[100], ch;
int i, key;
printf("Enter a message to decrypt: ");
gets(message);
printf("Enter key: ");
scanf("%d", &key);
for(i = 0; message[i] != '\0'; ++i){
ch = message[i];
if(ch >= 'a' && ch <= 'z'){
ch = ch - key;
if(ch < 'a'){
ch = ch + 'z' - 'a' + 1;
}
message[i] = ch;
}
else if(ch >= 'A' && ch <= 'Z'){
ch = ch - key;
if(ch < 'A'){
ch = ch + 'Z' - 'A' + 1;
}
message[i] = ch;
}
}
printf("Decrypted message: %s", message);
return 0;
}
```

Output:

```
Enter a message to decrypt: ebdh
Enter key: 4
Decrypted message: axzd
```

III. Conclusion

We have conclude that how should we perform Encryption and Decryption of entered data using Caesar Cipher.

IV. Exercise

Q.1 What Is Encryption and Decryption?

Q2. What is use of Caesar cipher?

Q3. What a short note on Caesar cipher?

Q4. Write is Substitution Cipher?

Answers

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Marks obtained			Dated signature of Teacher
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