Exp 1  
#include<bits/stdc++.h>

using namespace std;

int main()

{

string us, pwd,check,line;

int ch;

check="logged out";

map <string, string> m;

while(check=="logged out"){

cout<<"Select choice:\n 1. Sign In \n 2. log in"<<endl;

cin>>ch;

if(ch==1){

ofstream file("sample.txt", ios::app);

cout<< "Enter username: "<<endl;

cin>>us;

cout<<"Enter password: "<<endl;

cin>>pwd;

m.insert({us,pwd});

cout<<"Sign up successfully."<<endl;

file<<us<<" "<<pwd<<endl;

}

if(ch==2){

ifstream file("sample.txt");

cout<< "Enter username: "<<endl;

cin>>us;

cout<<"Enter password: "<<endl;

cin>>pwd;

if( m[us]==pwd){

cout<<"User verified! "<<endl;

check="Invalid login credentials!!";

}

else{

check="logged out";

cout<<"Invalid login credentials!!"<<endl;

}

}

}

}

o/p

Select choice:

1. Sign In

2. log in

1

Enter username:

abc

Enter password:

123

Sign up successfully.

Select choice:

1. Sign In

2. log in

2

Enter username:

abc

Enter password:

321

Invalid login credentials!!

Select choice:

1. Sign In

2. log in

2

Enter username:

abc

Enter password:

123

User verified!

--------------------------------

Process exited after 25.33 seconds with return value 0

Press any key to continue . . .

#include <iostream>

#include <string>

using namespace std;

struct User {

string username;

string password;

string email;

};

int main() {

User user;

int choice;

bool loggedIn = false;

while (true) {

cout << "\n=== Network Security Subject Portal ===\n";

cout << "1. Register\n";

cout << "2. Login\n";

cout << "3. Exit\n";

cout << "Enter your choice:";

cin >> choice;

switch (choice) {

case 1:

//Registration

cout << "Enter username:";

cin >> user.username;

cout << "Enter password:";

cin >> user.password;

cout << "Enter email:";

cin >> user.email;

cout << "Registration Succesful!\n";

break;

case 3:

// exit

cout << "Exiting the portal. Goodbye!\n";

return 0;

default:

cout << "Invalid choice! Please try again.\n";

break;

case 2:

if(user.username.empty() || user.password.empty()){

cout<<"no user registered";

break;

}

string inputusername,inputpassword;

cout<<"\n --- login ---\n";

cout<<"enter username:";

cin>>inputusername;

cout<<"enter password";

cin>>inputpassword;

if(inputusername==user.username && inputpassword==user.password){

cout<<"welcome to network secutrity "<<user.username<<"!\n";

loggedIn=true;

}

else{

cout<<"invaid usernme or password";

}

break;

}

if (loggedIn) break;

}

}

o/p

=== Network Security Subject Portal ===

1. Register

2. Login

3. Exit

Enter your choice:2

no user registered

=== Network Security Subject Portal ===

1. Register

2. Login

3. Exit

Enter your choice:1

Enter username:abc

Enter password:123

Enter email:abc

Registration Succesful!

=== Network Security Subject Portal ===

1. Register

2. Login

3. Exit

Enter your choice:2

--- login ---

enter username:abc

enter password123

welcome to network secutrity abc!

--------------------------------

Process exited after 17.24 seconds with return value 0

Press any key to continue . . .

Exp – 2  
#include <bits/stdc++.h>

using namespace std;

int main(){

string s;

cout<<"Enter the word: ";

cin>>s;

int len=s.length();

int z = 3;

for(int i=0;i<len;i++){

int y = (s[i] - 'a' + z) % 26;

cout << (char)('a' + y);

}

}

O/P

Enter the word: hello

khoor

--------------------------------

Process exited after 3.036 seconds with return value 0

Press any key to continue . . .

Exp - 3

I/P

#include <bits/stdc++.h>

using namespace std;

int main(){

string s;

cout<<"Enter the word: ";

cin>>s;

int len=s.length();

cout<<"Enter the code integer : ";

int z;

cin>>z;

for(int i=0;i<len;i++){

int y = (s[i] - 'a' + z) % 26;

cout << (char)('a' + y);

}

}

O/P

Enter the word: book

Enter the code integer : 3

errn

--------------------------------

Process exited after 5.085 seconds with return value 0

Press any key to continue . . .

#include <bits/stdc++.h>

using namespace std;

string Monoalpha(const string &plaintext, const string &key){

string ciphertext = "";

for (char ch: plaintext){

if (isalpha(ch)){

if (islower(ch)) ciphertext += key[ch-'a'];

else ciphertext += toupper(key[ch-'A']);

}

else ciphertext += ch;

}

return ciphertext;

}

int main(){

string plaintext, key;

cout<<"Enter the plaintext: ";

getline(cin, plaintext);

cout<<"Enter a 26 character key for substitution: ";

cin>>key;

if (key.length()!=26){

cout<<"Error: Key should be 26 characters long\n";

return 1;

}

string ciphertext = Monoalpha(plaintext, key);

cout<<"Ciphertext: "<<ciphertext<<endl;

}

OUTPUT:

Enter the plaintext: helloworld

Enter a 26 character key for substitution: abcdefghijklmnopqrstuvwxyz

Ciphertext: helloworld

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Process exited after 22.53 seconds with return value 0

Press any key to continue . . .  
  
VERNAM

i/p

#include <bits/stdc++.h>

#include<random>

using namespace std;

int main(){

srand(time(0));

string str;

cout<<"Enter the string to be coded in verner:";

cin>>str;

string ran = str;

int z=0;int len=str.length();

for (int i=0;i<len;i++){

int x = rand();

ran[i]=(char)('a'+ x%26);

}

cout << "one time pad : " << ran << '\n';

int arr[len];

for(int i=0;i<len;i++){

arr[i]=(str[i]-'a')+(ran[i]-'a');

}

string ver;

cout<<"numbers are:";

for (int i=0;i<len;i++){

arr[i] %= 26;

ver[i]=(char)(arr[i]+'a');

cout<<arr[i]<<" ";

}

cout<<endl<<"Vernam cipher is: ";

for(int i=0;i<len;i++){

cout<<ver[i]<< " ";

}

}

o/p

Enter the string to be coded in verner:hello

one time pad : zarfz

numbers are:6 4 2 16 13

Vernam cipher is:g e c q n

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Process exited after 1.901 seconds with return value 0

Press any key to continue . . .

Vigenere:

i/p:

#include <bits/stdc++.h>

using namespace std;

int main(){

string str;

string ran;

cout<<"Enter the string to be coded in vigenere:";

cin>>str;

string fixstr="mec";

int z=0;int len=str.length();

for (int i=0;i<len;i++){

if(z>2){

z=0;

}

ran[i]=fixstr[z];

z++;

}

int arr[len];

for(int i=0;i<len;i++){

arr[i]=(str[i]-'a')+(ran[i]-'a');

}

string ver;

cout<<"numbers are:";

for (int i=0;i<len;i++){

if(arr[i]>25){

arr[i]-=26;

}

ver[i]=(char)(arr[i]+'a');

cout<<arr[i];cout<<" ";

}

cout<<endl;

cout<<"vigenere cipher is:";

for(int i=0;i<len;i++){

cout<<ver[i];

cout<<" ";

}

}

o/p

Enter the string to be coded in vigenere:hello

numbers are:19 8 13 23 18

vigenere cipher is:t i n x s

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Process exited after 3.208 seconds with return value 0

Press any key to continue . . .

Exp – 4

I/P

#include <bits/stdc++.h>

using namespace std;

int main(){

int g, n;

cout<<"Enter the two large prime numbers agreed upon by Alice and Bob "<<endl;

cout<<"Enter 1st prime no: ";

cin>>n;

cout<<"Enter 2nd prime no: ";

cin>>g;

cout << "Enter x : ";

int x,y;

cin >> x;

cout << "Enter y : ";

cin >> y;

int a=(int)(pow(g,x))%n;

int b=(int)(pow(g,y))%n;

int k1=(int)(pow(b,x))%n;

int k2=(int)(pow(a,y))%n;

cout<<"The serial sent by Alice, K1 is: "<<k1<<endl;

cout<<"The serial sent by Bob, K2 is: "<<k2<<endl;

}

O/P:

Enter the two large prime numbers agreed upon by Alice and Bob

Enter 1st prime no: 11

Enter 2nd prime no: 7

Enter x : 3

Enter y : 6

The serial sent by Alice, K1 is: 9

The serial sent by Bob, K2 is: 9

--------------------------------

Process exited after 8.537 seconds with return value 0

Press any key to continue . . .

Exp – 6

#include <stdio.h>

#include <string.h>

void xor\_encrypt\_decrypt(char \*text, char key) {

for (int i = 0; text[i] != '\0'; i++) {

text[i] ^= key;

}

}

int main() {

char text[100], key;

printf("Enter text to encrypt: ");

fgets(text, sizeof(text), stdin);

text[strcspn(text, "\n")] = 0; // remove newline

printf("Enter a single character key: ");

scanf("%c", &key);

xor\_encrypt\_decrypt(text, key);

printf("Encrypted Text: %s\n", text);

xor\_encrypt\_decrypt(text, key);

printf("Decrypted Text: %s\n", text);

return 0;

}

Exp – 7

#include <openssl/aes.h>

#include <stdio.h>

#include <string.h>

int main() {

AES\_KEY enc\_key, dec\_key;

unsigned char key[] = "thisisa128bitkey"; // 16 bytes = 128-bit key

unsigned char text[] = "HelloWorldAES123"; // 16 bytes = 128-bit block

unsigned char encrypted[16], decrypted[16];

// Set encryption and decryption keys

AES\_set\_encrypt\_key(key, 128, &enc\_key);

AES\_set\_decrypt\_key(key, 128, &dec\_key);

// Encrypt the text

AES\_encrypt(text, encrypted, &enc\_key);

printf("Encrypted Text: ");

for (int i = 0; i < 16; i++)

printf("%02x ", encrypted[i]);

printf("\n");

// Decrypt the text

AES\_decrypt(encrypted, decrypted, &dec\_key);

printf("Decrypted Text: %s\n", decrypted);

return 0;

}

Exp – 9

#include<bits/stdc++.h>

using namespace std;

int gcd(int a, int b) {

int t;

while (1) {

t = a % b;

if (t == 0) return b;

a = b;

b = t;

}

}

int main() {

double p = 13;

double q = 11;

double n = p \* q;

double phi = (p - 1) \* (q - 1);

double e = 7;

double track;

while (e < phi) {

track = gcd(e, phi);

if (track == 1) break;

else e++;

}

double d1 = 1 / e;

double d = fmod(d1, phi);

double message = 9;

double c = pow(message, e);

double m = pow(c, d);

c = fmod(c, n);

m = fmod(m, n);

cout << "Original Message = " << message << '\n';

cout << "p = " << p << '\n';

cout << "q = " << q << '\n';

cout << "n = p\*q = " << n << '\n';

cout << "phi = " << phi << '\n';

cout << "e = " << e << '\n';

cout << "d = " << d << '\n';

cout << "Encrypted message = " << c << '\n';

cout << "Decrypted message = " << m << '\n';

}

output:

Original Message = 9

p = 13

q = 11

n = p\*q = 143

phi = 120

e = 7

d = 0.142857

Encrypted message = 48

Decrypted message = 9