

Project Report
On
Execution Of Login System

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Submitted as an assessment of
Data Structures Using C

Under the guidance of
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Index of Contents

1. Project Description
2. Objectives
3. Flowchart
4. Code
5. Output
6. Learning Outcomes
7. Bibliography

Project Description

Our group intends on implementing a login/authentication system in C language as a part of our assessment under the course Data Structures using C, guided by Professor Prabhat Thakur. This product has a wide range of applications, ranging from banks, universities, OTT platforms, cloud servers, personal use, etc. Today we live in a data driven world, therefore the protection of data becomes a major concern. One of the main verticals of data protection is “who gets to access what data?”. This issue can be solved by setting up a simple authentication system. It is a common security measure designed to prevent unauthorized access to confidential data. This system makes prevention and tracking of breach of access easy. A login system usually runs on the basis of associating an unique identifying password with each member of the system. The wide range of password options available make it resistant to attacks. For example, if we were to set up a system with passwords containing 4 numbers (0 to 9), with repetition allowed, we would still have 10000 combinations possible.

Vulnerabilities:

Although the login system is widely used now-a-days there also exists ways and techniques to corrupt the system and get hands on valuable data. One such way is **Password Theft**. It refers to the activity when an associated identity is revealed to masses other than the identity holder. Technological progress has made brute-force password-search tools, like “John the Ripper” extremely effective. As a result, attackers can find passwords fairly easily by following their **Electronic Fingerprints**. Another tool is **Phishing**, which attracts users to attractive content, asking them to use sensitive information to connect and view content.

Objectives

IDE used- Dev C++

Each associated identity has a full name, email address, password, user name and phone number. The user name is generated by removing the “@”, the domain name and the extension from the email address.

The program focuses on implementing 3 tasks at the moment-

1. Sign up
2. Login
3. Exit

The sign up creates a new associated identity. The above mentioned credentials are fed by the user. On successful sign up, a message is displayed, an user name is allotted and the password is remembered by the system.

The login asks the user for the user name and the password. On successful login, an appropriate message is displayed, whereas, if the credentials do not match, then a beeping sound along with an appropriate message is displayed.

The exit simply ends the execution of the program.

Vulnerabilities and areas of improvement-

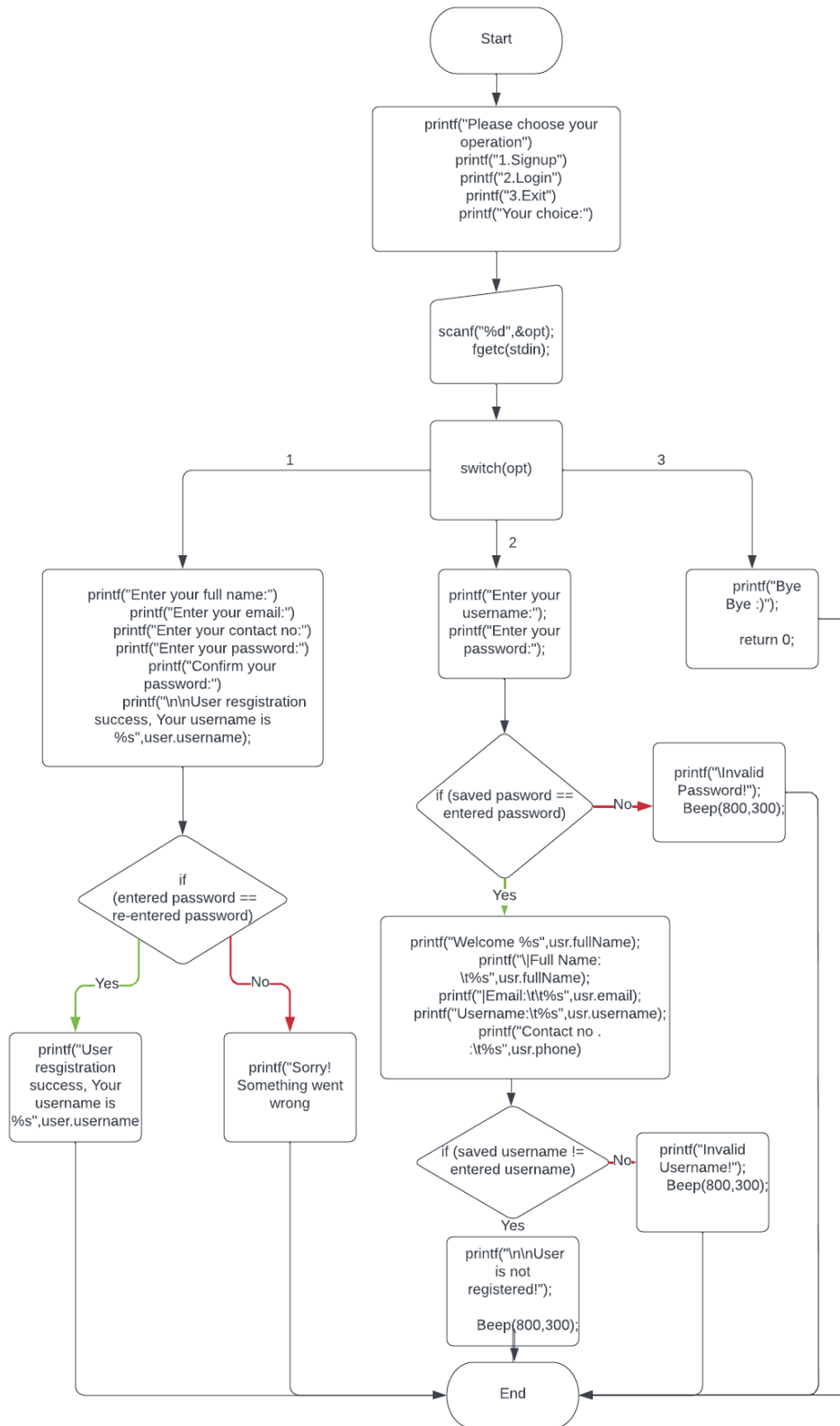
The system developed by us does allow you to sign up with the same email address. This makes the system vulnerable and less efficient in case a single user creates multiple ids using the same email address.

There is no algorithm that tests the vulnerability of the passwords entered by the user.

Flowchart

Link to the flowchart:

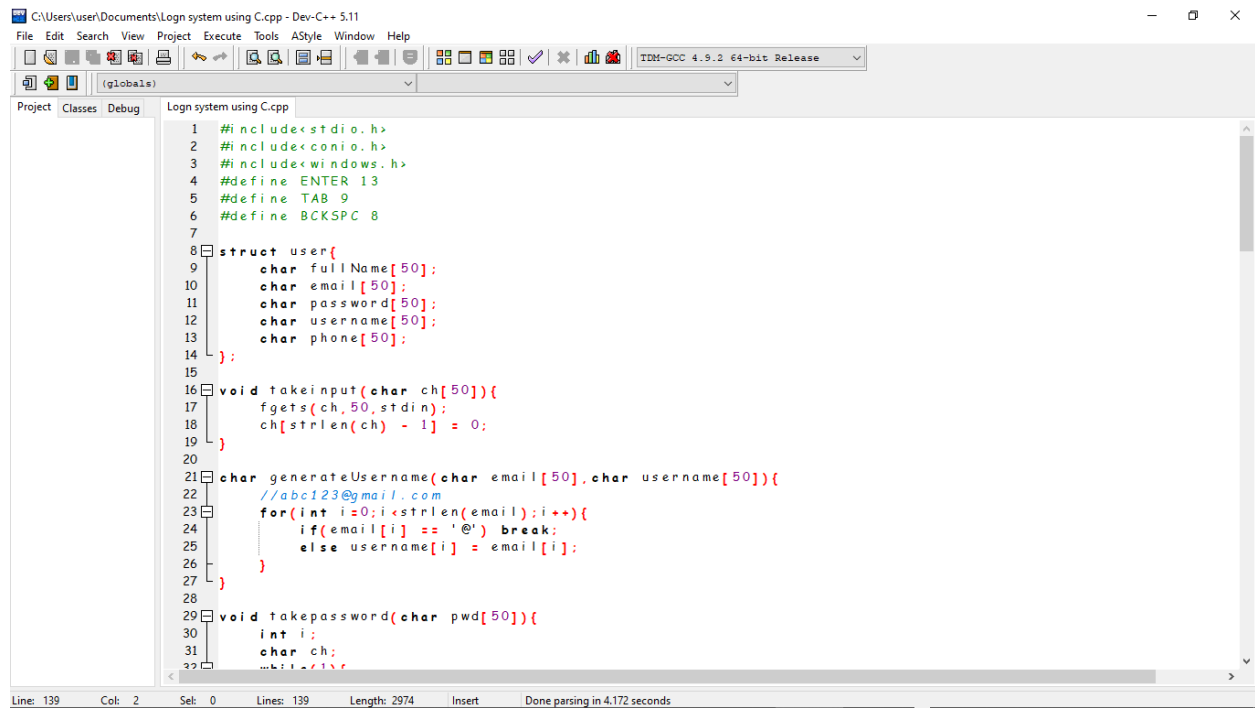
https://lucid.app/lucidchart/421bb3bc-89a1-449b-8f6a-ffd323d8bec4/edit?invitationId=inv_d07b3d08-705b-4334-b1bd-005f49c0019d



Code

Github link for the code:

<https://github.com/Prachi-Lal/Login-System-Using-C>



The screenshot shows a C++ IDE window titled "C:\Users\user\Documents\Login system using C.cpp - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar contains various icons for file operations, execution, and debugging. The compiler is set to "TDM-GCC 4.9.2 64-bit Release". The project is named "Login system using C.cpp". The code is as follows:

```
1  #include<stdio.h>
2  #include<conio.h>
3  #include<windows.h>
4  #define ENTER 13
5  #define TAB 9
6  #define BCKSPC 8
7
8  struct user{
9      char fullName[50];
10     char email[50];
11     char password[50];
12     char username[50];
13     char phone[50];
14 };
15
16 void takeinput(char ch[50]){
17     fgets(ch,50,stdin);
18     ch[strlen(ch) - 1] = 0;
19 }
20
21 char generateUsername(char email[50],char username[50]){
22     //abc123@gmail.com
23     for(int i=0;i<strlen(email);i++){
24         if(email[i] == '@') break;
25         else username[i] = email[i];
26     }
27 }
28
29 void takepassword(char pwd[50]){
30     int i;
31     char ch;
32     while(1){
33         printf("Enter password: ");
34         for(i=0;i<50;i++){
35             ch = getch();
36             if(ch == '\n') break;
37             pwd[i] = ch;
38         }
39         printf("\n");
40     }
41 }
```

The status bar at the bottom shows: Line: 139, Col: 2, Sel: 0, Lines: 139, Length: 2974, Insert, Done parsing in 4.172 seconds.

```
C:\Users\user\Documents\Logn system using C.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Classes Debug Logn system using C.cpp
31 char ch;
32 while(1){
33     ch = getch();
34     if(ch == ENTER || ch == TAB){
35         pwd[i] = '\0';
36         break;
37     } else if(ch == BCKSPC){
38         if(i > 0){
39             i--;
40             printf("\b\b");
41         }
42     } else{
43         pwd[i++] = ch;
44         printf("%c\b", ch);
45     }
46 }
47 }
48
49
50 int main()
51 {
52     system("color 0b");
53     FILE *fp;
54     int opt,usrFound = 0;
55     struct user user;
56     char password2[50];
57     printf("\n\t\t\t\t-----Welcome to authentication system-----");
58     printf("\nPlease choose your operation");
59     printf("\n1.Signup");
60     printf("\n2.Login");
61     printf("\n3.Exit");
62 }
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```
C:\Users\user\Documents\Logn system using C.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Classes Debug Logn system using C.cpp
91 Beep(750,300);
92 }
93 break;
94
95 case 2:
96
97 char username[50],pword[50];
98 struct user usr;
99
100 printf("\nEnter your username:\t");
101 takeinput(username);
102 printf("Enter your password:\t");
103 takepassword(pword);
104
105 fp = fopen("Users.dat","r");
106 while(fread(&usr,sizeof(struct user),1,fp)){
107 if(!strcmp(usr.username,username)){
108 if(!strcmp(usr.password,pword)){
109 system("cls");
110 printf("\n\t\t\t\t\tWelcome %s",usr.fullName);
111 printf("\n\nFull Name:\t%s",usr.fullName);
112 printf("\nEmail:\t\t\t%s",usr.email);
113 printf("\nUsername:\t\t%s",usr.username);
114 printf("\nContact no.:\t\t%s",usr.phone);
115 }
116 else {
117 printf("\n\nInvalid Password!");
118 Beep(800,300);
119 }
120 usrFound = 1;
121 }
122 }
123 }
```

Line: 139 Col: 2 Sel: 0 Lines: 139 Length: 2974 Insert Done parsing in 4.172 seconds

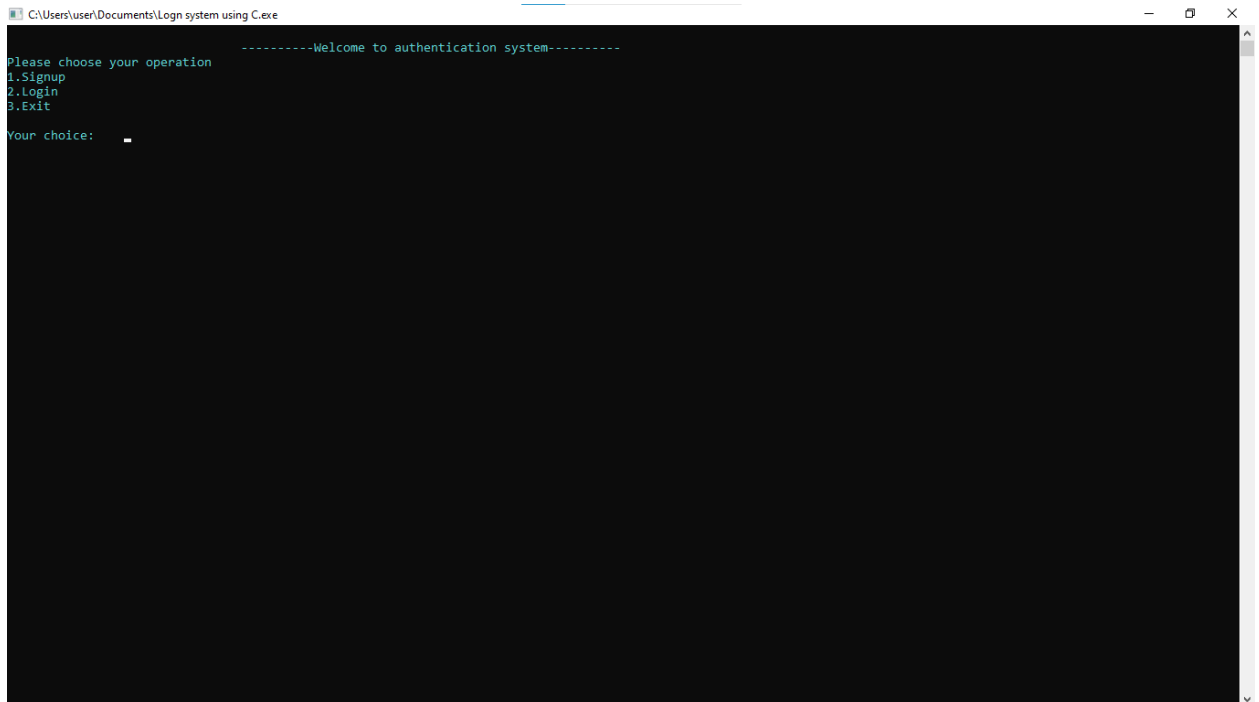
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C:\Users\user\Documents\Logn system using C.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Classes Debug Logn system using C.cpp
109 system("cls");
110 printf("\n\t\t\t\t\tWelcome %s",usr.fullName);
111 printf("\n\nFull Name:\t%s",usr.fullName);
112 printf("\nEmail:\t\t\t%s",usr.email);
113 printf("\nUsername:\t\t%s",usr.username);
114 printf("\nContact no.:\t\t%s",usr.phone);
115 }
116 else {
117 printf("\n\nInvalid Password!");
118 Beep(800,300);
119 }
120 usrFound = 1;
121 }
122 }
123 if(!usrFound){
124 printf("\n\nUser is not registered!");
125 Beep(800,300);
126 }
127 fclose(fp);
128 break;
129
130 case 3:
131 printf("\t\t\t\t\tBye Bye :)");
132 return 0;
133 }
134
135
136
137
138 return 0;
139 }
```

Line: 111 Col: 68 Sel: 0 Lines: 139 Length: 2974 Insert Done parsing in 4.172 seconds

Output

We test run our program, checking for a couple of scenarios. The snapshots of the same have been attached below.

1. Initial Setup



```
C:\Users\User\Documents\Logn system using C.exe

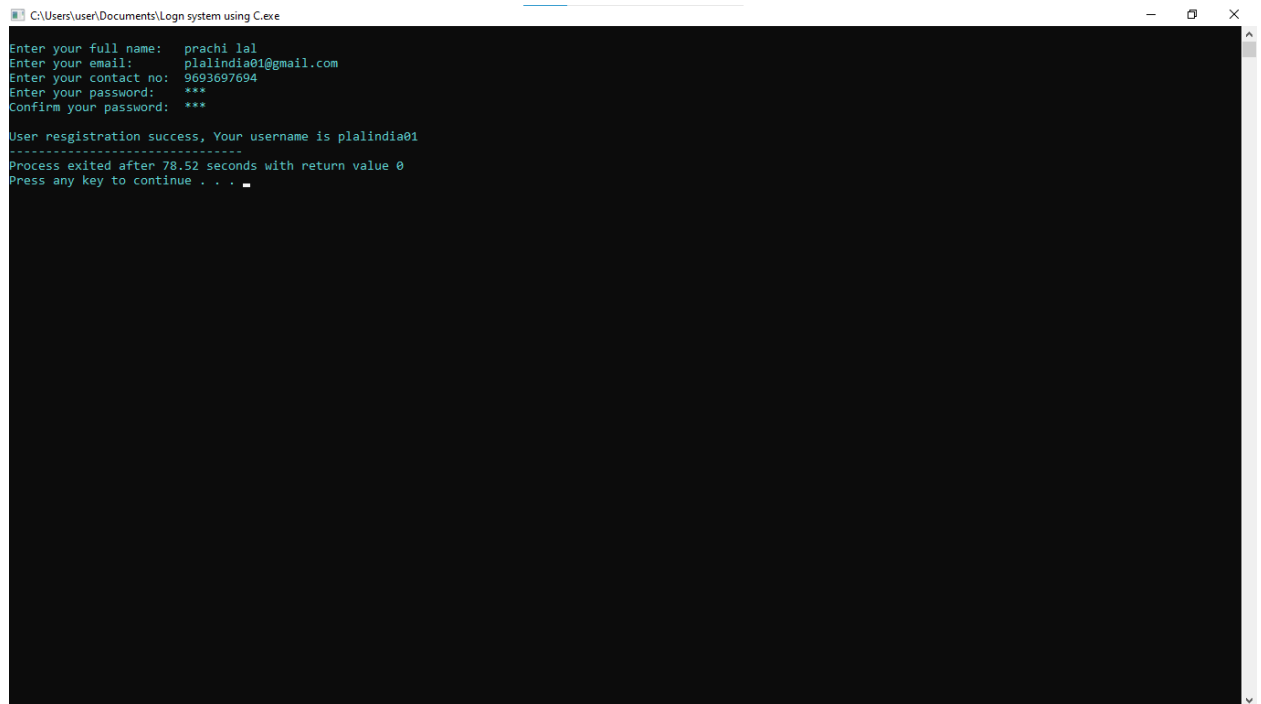
Please choose your operation
1.Signup
2.Login
3.Exit
Your choice: _
```

The screenshot shows a Windows command prompt window titled "C:\Users\User\Documents\Logn system using C.exe". The window has a black background with white text. The text displayed is as follows:

```
-----Welcome to authentication system-----
Please choose your operation
1.Signup
2.Login
3.Exit
Your choice: _
```

The cursor is positioned after the underscore in "Your choice: _", indicating that the user is about to enter a choice.

2. Successful Sign Up

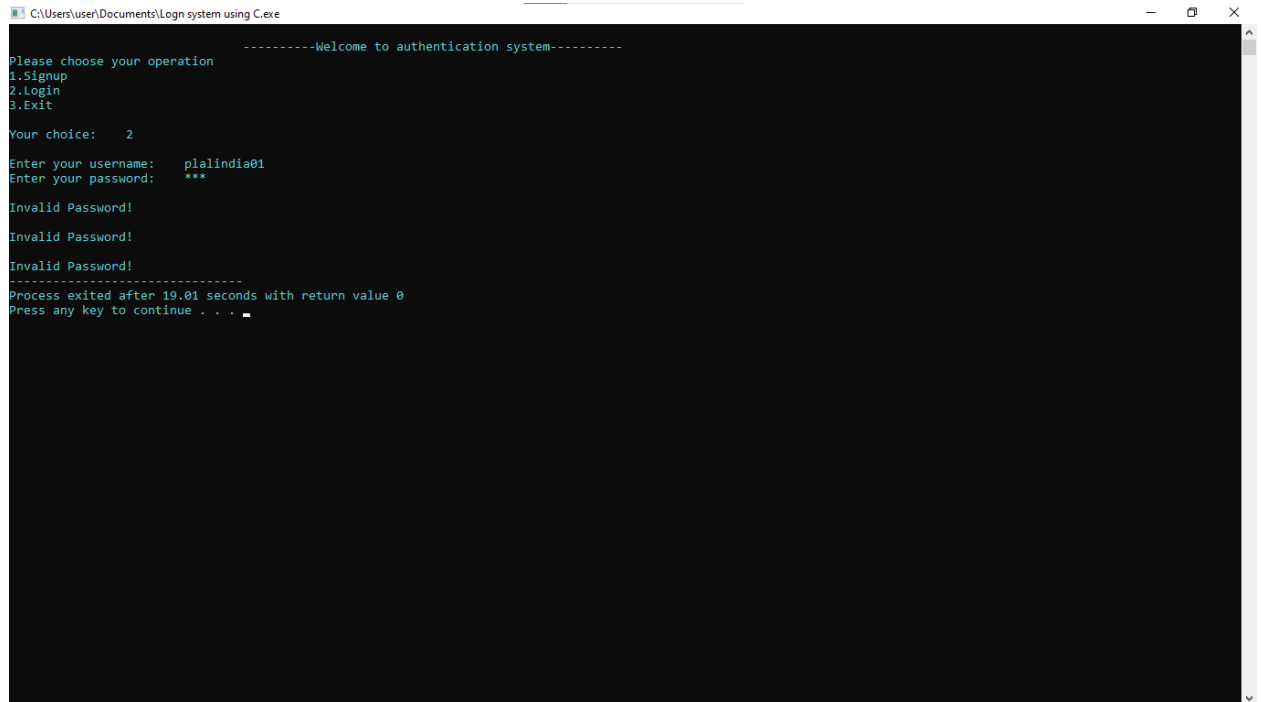


```
C:\Users\User\Documents\Logn system using C.exe

Enter your full name: prachi lal
Enter your email: plalindia01@gmail.com
Enter your contact no: 9693697694
Enter your password: ***
Confirm your password: ***

User resgistration success, Your username is plalindia01
-----
Process exited after 78.52 seconds with return value 0
Press any key to continue . . .
```

3. Invalid Password



```
C:\Users\User\Documents\Logn system using C.exe

-----Welcome to authentication system-----

Please choose your operation
1.Signup
2.Login
3.Exit

Your choice: 2

Enter your username: plalindia01
Enter your password: ***

Invalid Password!

Invalid Password!

Invalid Password!

-----
Process exited after 19.01 seconds with return value 0
Press any key to continue . . .
```

Learning Objectives

We, as a team, are proud of ourselves for being able to complete this project in the given time frame. We would like to extend our gratitude to Professor Prabhat Thakur for such a great learning experience. This project puts our theoretical knowledge to practical use. We explored different libraries in C. We also made use of data structures, like “struct” to use. We now understand how appropriate use of data structures can make a program more efficient and economical. We made use of multiple custom tailored methods to make the code less complicated and clear. We made use of iterative and conditional statements wherever required. The project also gave us a clear idea of what data type needs to be associated with what variable. We also tried using a beeping sound to announce unauthorized access. The project might not be industry standard, because of its existing vulnerabilities, but still is a decent implementation of a login system, with its basic abilities.

Bibliography

We would like to thank the following resources for making our lives easier during the implementation of this project-

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