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SECURE CODING LAB

1. Write a C Program to authenticate a user using username and password. Have a list of 5 usernames and passwords in an array. If the entered username and password matches with the username / password combination in the array, then print as “Authentication Successful” else print “Authentication failed , try again”. The user is permitted to enter the wrong password only 3 times. If the user exceeds the limit, then print “Limit exceeded. Try later”.

Source Code:-

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

int main ()
{
char * username[5] = {
   "tousif", "akhil", "shebu", "rahul", "ravi"
};

char * password[5] = {
     "tousif", "akhil", "shebu", "rahul", "ravi"
};
   int i;
   char iu[20],ip[20];
   int limit=0,flag=0;
   while(limit<3)
{

   printf("Enter Username and Password\n");
   scanf("%s",iu);
   scanf("%s",ip);
   for (i = 0; i < 5; i++) {
      if (!strcmp(iu,username[i]))
      {
         if(!strcmp(ip,password[i]))
         {
            printf("Authentication Successful\n");
                  flag=1;
```

```
                        break;
                        }

        }
    }
if(flag==0)
{
        printf("\n Authentication Failed. Try Again!\n");
}       limit++;
else
break;
}

{       if(flag==0)

}       printf("\n Limit exceeded. try later\n");
}
```

Output :-

```
tousif@TousifVM:~$ cd Desktop
tousif@TousifVM:~/Desktop$ gcc prog1.c -o prog1
tousif@TousifVM:~/Desktop$ ./prog1
Enter Username and Password
tousif
qwer

 Authentication Failed. Try Again!
Enter Username and Password
akhil
rtyu

 Authentication Failed. Try Again!
Enter Username and Password
user
pswd

 Authentication Failed. Try Again!

 Limit exceeded. try later
tousif@TousifVM:~/Desktop$ ./prog1
Enter Username and Password
tousif
tousif
Authentication Successful
tousif@TousifVM:~/Desktop$
```

2. Write a C program to create a password strength meter. A password is said to be strongif it is at least 8 characters long and contains at least one lowercase character, one uppercase character, one special character (!@#$%^&*()) andone digit. The program should obtain a password string from the user and compute the password strength (in percentage) based on the 5 criteria listed above for strong passwords.

Source Code :-

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

void main()
{
   char pswd[30];
   printf("Enter your Password \n");
   scanf("%s",pswd);
   printf("%s",pswd);
   int len,per=0,i,upcount=0,locount=0,dicount=0,speccount=0;
   len=strlen(pswd);
   if(len>=8)
   {
      per=per+20;
   }
   for(i=0;i<len;i++)
   {
      if(isupper(pswd[i]))
      {
         upcount++;
      }
      else
      if(islower(pswd[i]))
      {
         locount++;
      }
      else
      if(isdigit(pswd[i]))
      {
         dicount++;
```

```
    }
    else
    {
        speccount++;
    }
}
if(upcount)
{
    per=per+20;
}
if(locount)
{
    per=per+20;
}
if(dicount)
{
    per=per+20;
}
if(speccount)
{
    per=per+20;
}
printf("Your Password Strength is: %d",per);
}
```

Output :-

```
tousif@TousifVM:~/Desktop$ gcc prog2.c -o prog2
tousif@TousifVM:~/Desktop$ ./prog2
Enter your Password
tousif
tousif
 Your Password Strength is:  20
tousif@TousifVM:~/Desktop$ ./prog2
Enter your Password
tousiftousif
tousiftousif
 Your Password Strength is:  40
tousif@TousifVM:~/Desktop$ ./prog2
Enter your Password
tousif123
tousif123
 Your Password Strength is:  60
tousif@TousifVM:~/Desktop$ ./prog2
Enter your Password
touSIF123
touSIF123
 Your Password Strength is:  80
tousif@TousifVM:~/Desktop$ ./prog2
Enter your Password
T@usif789
T@usif789
 Your Password Strength is:  100
tousif@TousifVM:~/Desktop$
```

3. Write a C program to generate strong passwords of a length specified by the user.

Source Code :-

```
#include<stdio.h>
#include<stdlib.h>
#include<time.h>
int main()
{
   char upper[30] = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";
   char lower[30] = "abcdefghijklmnopqrstuvwxyz";
   char dig[10] = "1234567890";
```

```
char spcl[10] = "!@#$%^&*()";
int n=0,i,a,b,c,d;
srand(time(NULL));
while(n<=8)
{
   printf("Enter the number greater than 7\n");
   scanf("%d", &n);
}
printf("\nThe Generated Strong Password: ");
for(int i=0; i<n/4; i++)
{
   a = (rand()%25);
   b = (rand()%25);
   c = (rand()%9);
   d = (rand()%9);
   printf("%c%c%c%c", upper[a], lower[b], dig[c] , spcl[d]);
}
if(n%4 == 3)
{
   b = (rand()%25);
   d = (rand()%9);
   c = (rand()%9);
   printf("%c%c%c", lower[b], dig[c] , spcl[d]);
}
if(n%4 == 2)
{
   a = (rand()%25);
   c = (rand()%9);
   printf("%c%c", upper[a], dig[c]);
}
if(n%4 == 1)
{
   d = (rand()%9);
   printf("%c",spcl[d]);
}
printf("\n");
return 0;
}
```

Output :-

```
tousif@TousifVM:~/Desktop$ gcc prog3.c -o prog3
tousif@TousifVM:~/Desktop$ ./prog3
Enter the number greater than 7
5
Enter the number greater than 7
12

The Generated Strong Password: Rs3*Dd6%Mh4#
tousif@TousifVM:~/Desktop$ ./prog3
Enter the number greater than 7
11

The Generated Strong Password: Oc1!Qq3$m7%
tousif@TousifVM:~/Desktop$ ./prog3
Enter the number greater than 7
14

The Generated Strong Password: Qp7%Nt7$Qa5#L8
tousif@TousifVM:~/Desktop$
```