Lab 1:
String Operations using Pointers

➔ Aim:

Perform the following operations: 1.Length 2.Copy 3.Concat 4.Compare 5.Reverse

➔ Theory:

● What is String?

String is a sequential set of characters which may include alphabets, numbers or symbols. For example: “Hello123@mail.com” is a string which contains 17 characters

.

● String Operations:

There are various operations that could be performed on a string. Following are the widely used operations on the string:

1.Length
2.Copy
3.Concat
4.Compare.
5.Reverse.

We can perform string operations using pointers or using library functions.
The following are the library function to perform string operations if the string is character array:

1.strlen(str): To find length of string
2.strcpy(dest,src): To copy src in dest.
3.strcat(first,second): To concatenate two strings.
4.strcmp(first,second): To compare two strings.
5. strrev(str): To reverse a string.

1. String Length:

This operation gives the length i.e the number of characters in the string. For example: ”Data Structures” is a string which has length as 15 including the white spaces.

Pseudocode:

```
void stringLength(char* s1)
{
int slen1=0;
while(*s1)
{
*s1++;
slen1++;
}
cout<<"\nLength of String 1: "<<slen1;
```

```
}
```

2. String Copy:
This operation copies the one string into another.For example variable ‘src’ contains “Hello!” which is to be copied in variable ‘dest’.
Pseudocode:

```
void stringCopy(char* s1,char* s2)
{
while(*s1)
{
*s2=*s1;
*s1++;
*s2++;
}
*s2='\0';
}
```

3. String Concatenate:
Concatenate operation is used to add or join two strings. For example, if string “C++ ” is to be added with “Programming” then this operation will be used which will give “C++ Programming” as the resultant string.
Pseudocode:

```
void stringConcatenate(char* s1,char* s2)
{
while(*s1)
{
s1++;
}
while(*s2)
{
*s1=*s2;
s2++;
s1++;
}
*s1='\0';
}
```

4. String Compare: This operation is used to check whether two strings are equal or not.
Pseudocode:

```
bool stringCompare(char* s1,char* s2)
{
while(*s1 == *s2)
{
if((*s1=='\0')&&(*s2=='\0'){
return true;
s1++;
s2++;
}
```

return false;
}

5. String Reverse:

This operation is used to reverse the string sequence. For example, After reverse operation “Hello” string will be “olleH”.

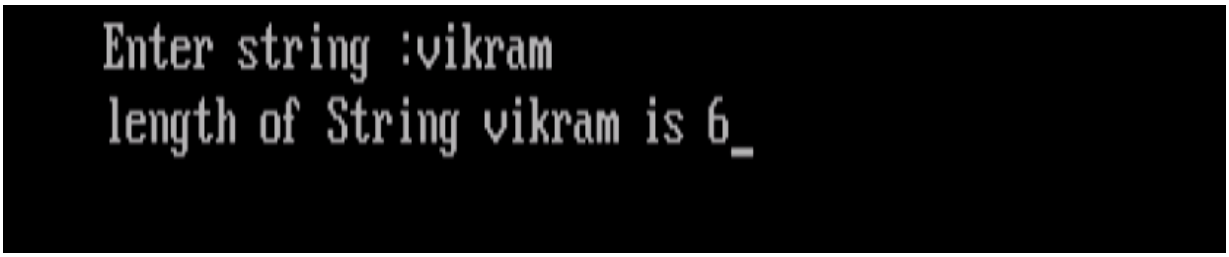
Pseudocode:

```
void stringReverse(char *s1)
{
int len=0,i=0;
char *begin,*end,temp;
begin=s1;
end=s1;
while(*s1)
{
*s1++;
len++;
}
for(i=0;i<(len-1);i++)
{
end++;
}
for(i=0;i<(len/2);i++)
{
temp=*begin;
*begin=*end;
*end=temp;
begin++;
end--;
}
}
```

1. **Program to find length of string:**

```
#include<iostream.h>

#include<conio.h>

void main()

{

int length=0;

char a[50],*ptr;

cout<<"Enter string :";
```

```
cin>>a;
ptr=a;
while(*ptr!='\0')
{
length++;
ptr++;
}
cout<<"length of String "<<a<<" is "<<length;
getch();
}
```



2. **Program to copy one string to another using pointer**

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
void main()
```

```
{
clrscr();
char a[50]="hello ",b[50]="world",*ptr,*p2;
ptr=a;
p2=b;
while(*p2!='\0')
{
*ptr=*p2;
p2++;
ptr++;
}
ptr='\0';
cout<<a;
getch();
}
```

3. Program for concatenation for strings:

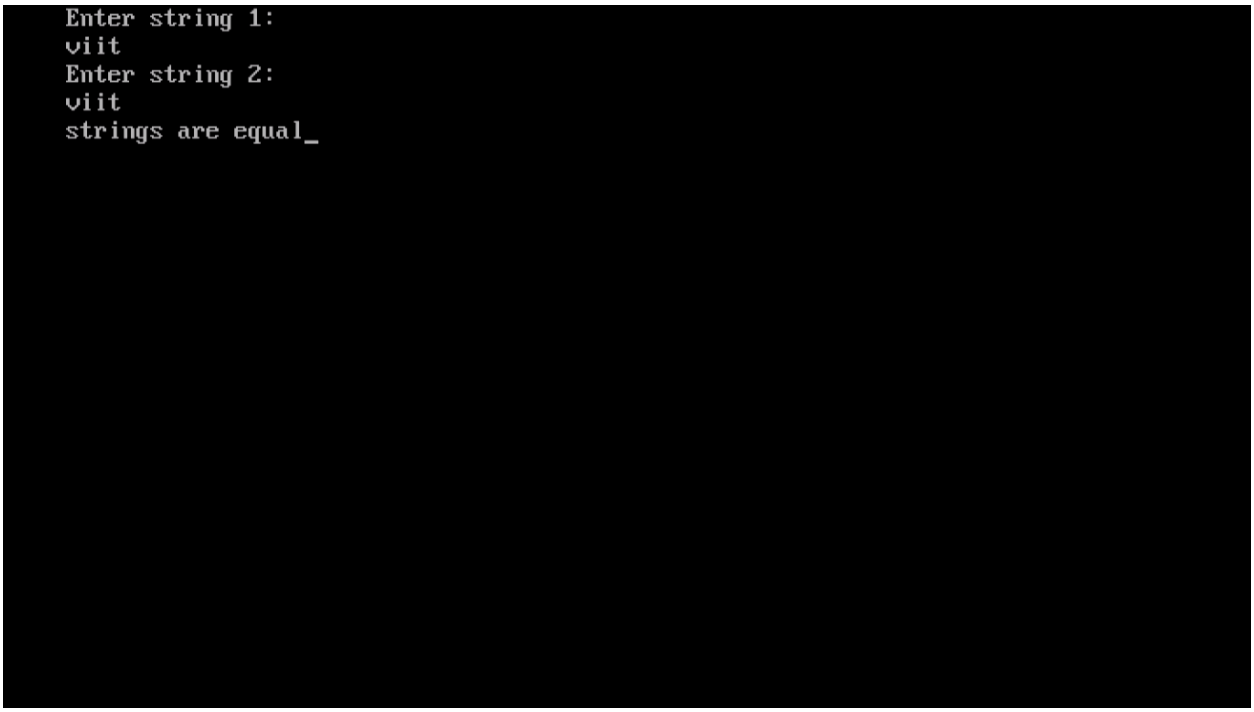
```
#include<iostream.h>
#include<conio.h>
#include<string.h>
```

```
void main()
{
clrscr();
char a[50]="hello ",b[50]="world",*ptr,*p2;
ptr=a+strlen(a);
p2=b;
while(*p2!='\0')
{
*ptr=*p2;
p2++;
ptr++;
}
ptr='\0';
cout<<a;
getch();
}
```

4. Program to compare two strings:

```
#include<iostream.h>
#include<conio.h>

int string_compare(char *s1,char *s2)
{
 while(*s1==*s2)
 {
   if((*s1=='\0')&&(*s2=='\0'))
   return 1;
   s1++;
   s2++;
 }
 return 0;
}
void main()
{
clrscr();
int b1;
char a[50],b[50],*p1,*p2;
cout<<"Enter string 1:"<<endl;
cin>>a;
cout<<"Enter string 2:"<<endl;
cin>>b;
```

```
p1=a;

p2=b;

b1=string_compare(p1,p2);




if(b1==0)

cout<<"strings are not equal";

else

cout<<"strings are equal";

getch();

}
```



5. Program to reverse string:

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
void main()
{
char a[20],b[20],*q,*p;
int l;
clrscr();
cout<<"enter strings:"<<endl;
cin>>a;
l=strlen(a);
p=a;
p=p+l-1;
while(*p!='\0')
{
cout<<*p;
p--;
}
getch();
}
```

➔ **Conclusion:**
In this way the string operations like String Length, String Copy, String Concat, String Compare, String Reverse can be performed using pointers.