Experiment - 1

Aim: Introduction to Linux and Vi editor.

Source:
Introduction to Linux:

Linux stands as a testament to the power of open-source collaboration, offering an operating system that marries stability, security, and adaptability. Its Unix-like architecture serves as a canvas for various distributions, with each, like Ubuntu or CentOS, painting its unique strokes to cater to diverse user needs. The hierarchical file system, spearheaded by the root directory ("/"), orchestrates the organization of files and directories.

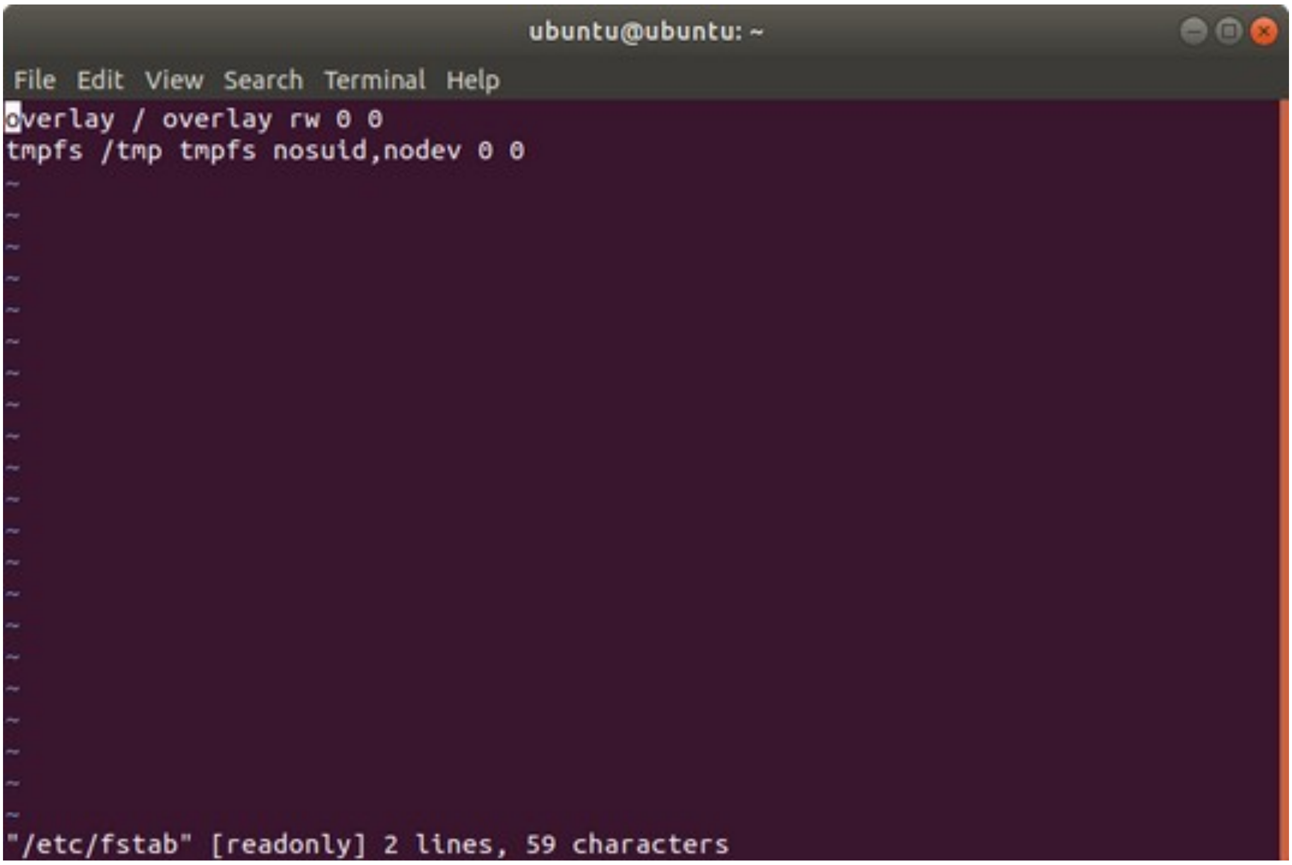
What sets Linux apart is its command-line interface (CLI), an omnipotent tool for users to navigate, configure, and optimize their systems. Package management, facilitated by tools like apt and yum, introduces a streamlined approach to software installation and maintenance. This inherent flexibility positions Linux not only as a robust choice for servers and embedded systems but also as an accessible platform for personal computing.

Introduction to Vi Editor:

Vi, or "Visual Editor," asserts its dominance as a stalwart text editor within the Unix/Linux realm. Functioning seamlessly in Command, Insert, and Visual modes, Vi presents users with a dynamic environment for text manipulation. Basic commands like `dd` for deletion and `yy` for copying provide the building blocks for efficient editing, while advanced features such as intricate navigation, global search and replace capabilities, and a customizable interface elevate Vi to an indispensable tool for seasoned users.

Behind the scenes, Vi's configuration files, most notably `.vimrc`, offer a canvas for users to tailor their editing experience. The evolution of Vi into Vim (Vi Improved) adds a layer of sophistication, introducing a plethora of enhancements to enrich the editing journey. Vim, with its extended functionalities, becomes not just an editor but an environment where creativity meets productivity, solidifying its place as a text-editing powerhouse in the Unix/Linux ecosystem.

Snippets:



```
overlay / overlay rw 0 0
tmpfs /tmp tmpfs nosuid,nodev 0 0
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~
"/etc/fstab" [readonly] 2 lines, 59 characters
```
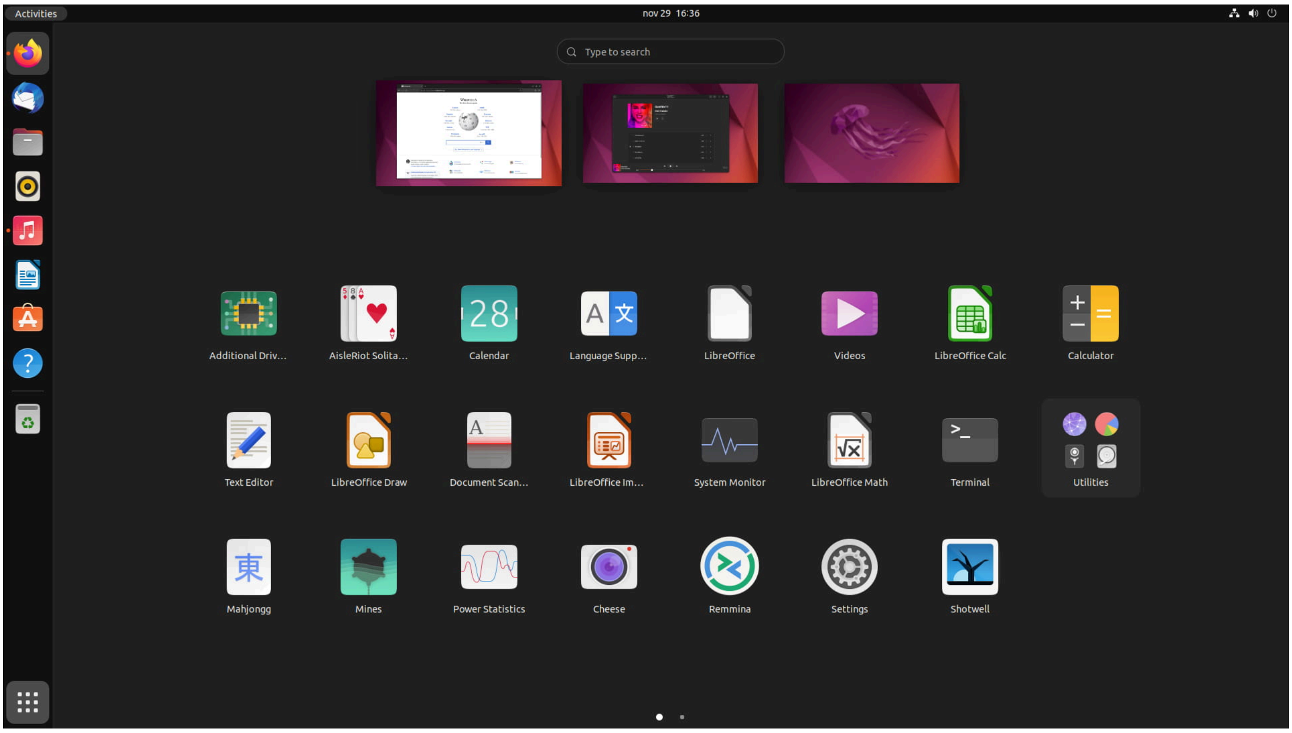


Activities
nov 29 16:36
Type to search
Additional Driv...
AisleRiot Solita...
Calendar
Language Supp...
LibreOffice
Videos
LibreOffice Calc
Calculator
Text Editor
LibreOffice Draw
Document Scan...
LibreOffice Im...
System Monitor
LibreOffice Math
Terminal
Utilities
Mahjongg
Mines
Power Statistics
Cheese
Remmina
Settings
Shotwell

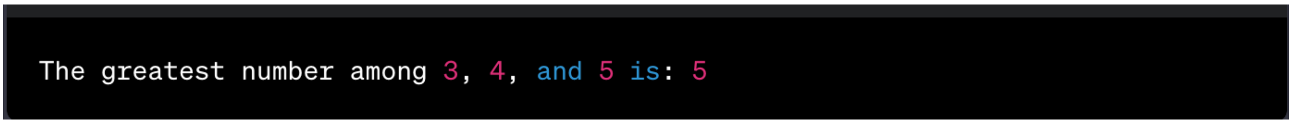
Experiment - 2

Aim: Write a program to find the greatest of three numbers (numbers passed as command line parameters)

Source:

```
#include<iostream>
#include<cstdlib> // For atoi function

using namespace std;

int findGreatest(int num1, int num2, int num3) {
   // Find the maximum among three numbers
   return max(num1, max(num2, num3));
}

int main(int argc, char* argv[]) {
   // Check if three command-line arguments are provided
   if (argc != 4) {
      cout << "Please provide three numbers as command-line parameters." << endl;
   } else {
      // Parse command-line arguments as integers
      int num1 = atoi(argv[1]);
      int num2 = atoi(argv[2]);
      int num3 = atoi(argv[3]);

      // Call the function to find the greatest number
      int result = findGreatest(num1, num2, num3);

      // Display the result
      cout << "The greatest number among " << num1 << ", " << num2 << ", and " << num3 << " is: " <<
result << endl;
   }

   return 0;
}
```

Output:



```
The greatest number among 3, 4, and 5 is: 5
```

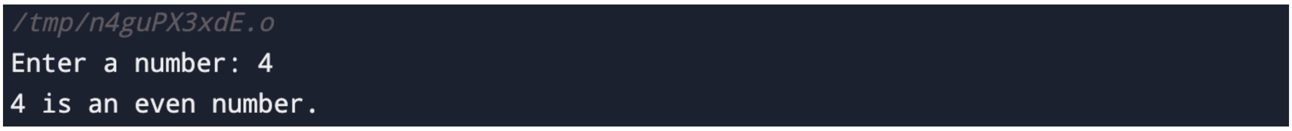
Experiment - 3

Aim: Write a script to check whether the given no. is even/odd

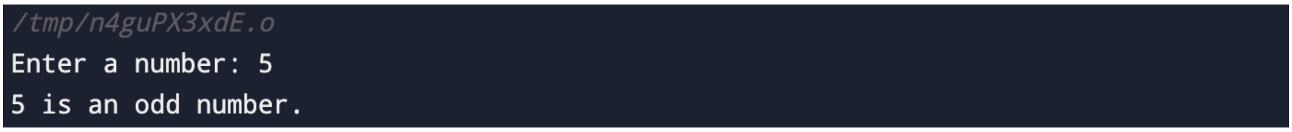
Source:

```
#include<iostream>

using namespace std;

int main() {
    // Declare a variable to store the user input
    int number;

    // Prompt the user to enter a number
    cout << "Enter a number: ";
    cin >> number;

    // Check if the number is even or odd
    if (number % 2 == 0) {
        cout << number << " is an even number." << endl;
    } else {
        cout << number << " is an odd number." << endl;
    }

    return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter a number: 4
4 is an even number.
```



```
/tmp/n4guPX3xdE.o
Enter a number: 5
5 is an odd number.
```

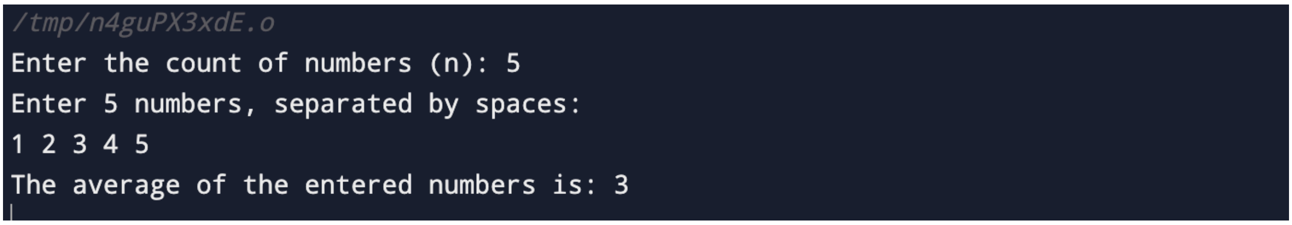
Experiment - 4

Aim: Write a script to calculate the average of n numbers

Source:

```
#include<iostream>

using namespace std;

int main() {
   // Declare variables
   int n;
   double sum = 0.0;

   // Prompt the user to enter the count of numbers
   cout << "Enter the count of numbers (n): ";
   cin >> n;

   // Check if n is non-negative
   if (n <= 0) {
      cout << "Please enter a positive count of numbers." << endl;
      return 1; // Indicate an error
   }

   // Prompt the user to enter the numbers
   cout << "Enter " << n << " numbers, separated by spaces:" << endl;

   // Read and calculate the sum
   for (int i = 0; i < n; ++i) {
      double number;
      cin >> number;
      sum += number;
   }

   // Calculate the average
   double average = sum / n;

   // Display the result
   cout << "The average of the entered numbers is: " << average << endl;

   return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter the count of numbers (n): 5
Enter 5 numbers, separated by spaces:
1 2 3 4 5
The average of the entered numbers is: 3
```

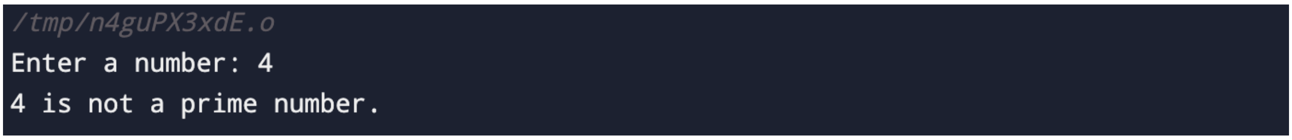
Experiment - 5

Aim: Write a script to check whether the given number is prime or not

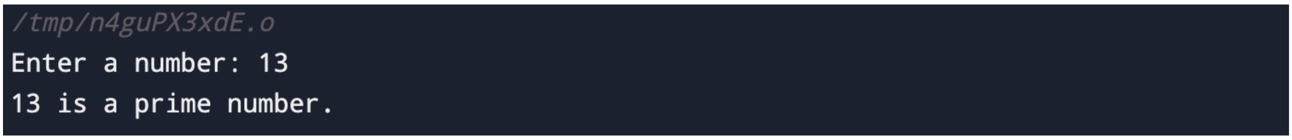
Source:

```
#include<iostream>
#include<cmath>

using namespace std;

bool isPrime(int number) {
    // Check for special cases
    if (number <= 1) {
        return false;
    }

    // Check for divisibility up to the square root of the number
    for (int i = 2; i <= sqrt(number); ++i) {
        if (number % i == 0) {
            return false; // Number is divisible by i, not prime
        }
    }

    return true; // Number is prime
}

int main() {
    // Declare a variable to store the user input
    int number;

    // Prompt the user to enter a number
    cout << "Enter a number: ";
    cin >> number;

    // Check if the number is prime
    if (isPrime(number)) {
        cout << number << " is a prime number." << endl;
    } else {
        cout << number << " is not a prime number." << endl;
    }

    return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter a number: 4
4 is not a prime number.
```



```
/tmp/n4guPX3xdE.o
Enter a number: 13
13 is a prime number.
```

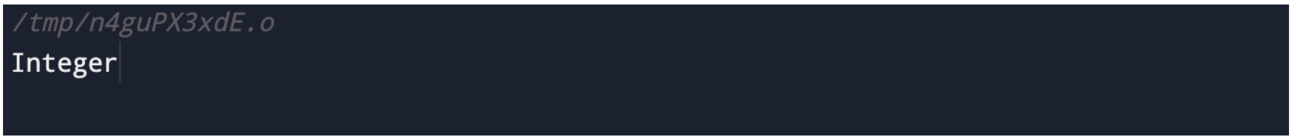
Experiment - 6

Aim: Write a program to check whether the given input is a number or a string

Source:

```
#include <iostream>
using namespace std;

// Function to check if st is number or not
bool isNumber(string st){
	int i = 0;
	while (st[i] != NULL) {
		if (st[i] < 48 || st[i] > 57)
			return false;
		i++;
	}
	return true;
}

int main(){

	// Saving the input in a string
	string st = "123";

	// Function returns true if all elements are in
	// range '0-9'
	if (isNumber(st))
		cout << "Integer";

	// Function returns false if the input is not an
	// integer, a string
	else
		cout << "String";

	return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Integer
```

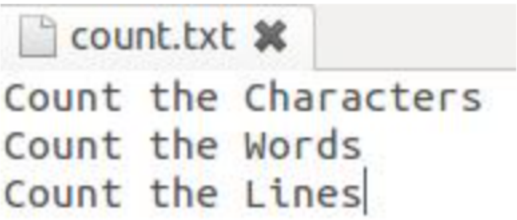
Experiment - 7

Aim: Write a program to compute no. of characters and words in each line of given file

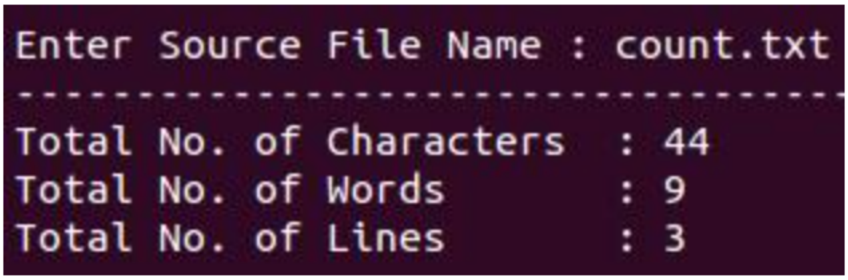
Source:

```
#include<iostream>
#include<fstream>
#include<string.h>
#include<cstdlib>
using namespace std;
int main()
{
    int noc=0,now=0,nol=0;
    FILE *fr;
    char fname[20],ch;

    cout<<"\n Enter Source File Name : ";
    gets(fname);
    fr=fopen(fname,"r");
    if(fr==NULL)
    {
        cout<<"\n Invalid File Name. \n No such File or Directory ";
        exit(0);
    }
    ch=fgetc(fr);
    while(ch!=EOF)
    {
        if(ch!=' ' && ch!='\n')
            noc++;
        if(ch==' ')
            now++;
        if(ch=='\n')
        {
            nol++;
            now++;
        }
        ch=fgetc(fr);
    }
    fclose(fr);
    cout<<" -------------------------------------";
    cout<<"\n Total No. of Characters  : "<<noc;
    cout<<"\n Total No. of Words       : "<<now;
    cout<<"\n Total No. of Lines       : "<<nol;

    return 0;
}
```

Output:
count.txt



```
Count the Characters
Count the Words
Count the Lines
```



```
Enter Source File Name : count.txt
-----------------------------------
Total No. of Characters  : 44
Total No. of Words       : 9
Total No. of Lines       : 3
```

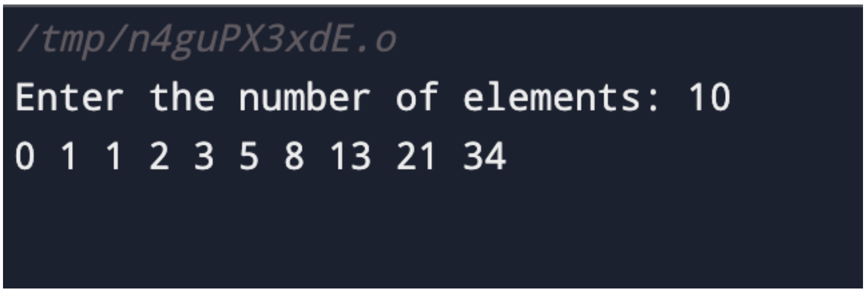
Experiment - 8

Aim: Write a program to print the Fibonacci series upto n terms

Source:

```
#include <iostream>
using namespace std;
int main() {
  int n1=0,n2=1,n3,i,number;
 cout<<"Enter the number of elements: ";
 cin>>number;
 cout<<n1<<" "<<n2<<" "; //printing 0 and 1
 for(i=2;i<number;++i) //loop starts from 2 because 0 and 1 are already printed
 {
  n3=n1+n2;
  cout<<n3<<" ";
  n1=n2;
  n2=n3;
 }
   return 0;
   }
```

Output:



```
/tmp/n4guPX3xdE.o
Enter the number of elements: 10
0 1 1 2 3 5 8 13 21 34
```

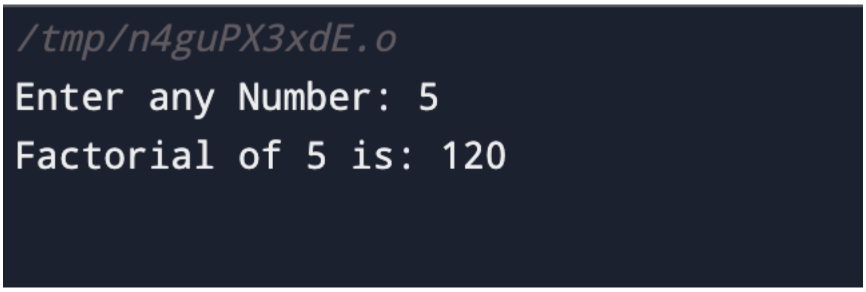
Experiment - 9

Aim: Write a program to calculate the factorial of a given number

Source:

```
#include <iostream>
using namespace std;
int main()
{
   int i,fact=1,number;
  cout<<"Enter any Number: ";
 cin>>number;
  for(i=1;i<=number;i++){
      fact=fact*i;
  }
  cout<<"Factorial of " <<number<<" is: "<<fact<<endl;
  return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter any Number: 5
Factorial of 5 is: 120
```

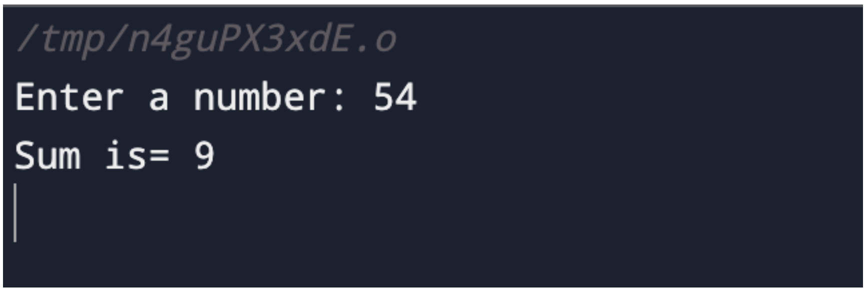
Experiment - 10

Aim: Write a program to calculate the sum of digits of the given number

Source:

```
#include <iostream>
using namespace std;
int main()
{
int n,sum=0,m;
cout<<"Enter a number: ";
cin>>n;
while(n>0)
{
m=n%10;
sum=sum+m;
n=n/10;
}
cout<<"Sum is= "<<sum<<endl;
return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter a number: 54
Sum is= 9
```

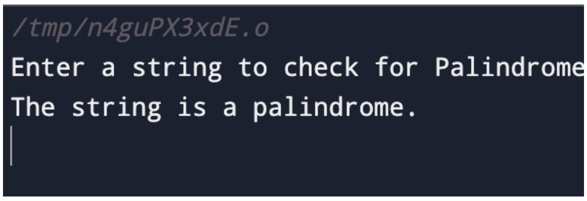
Experiment - 11

Aim: Write a program to check whether the given string is a palindrome

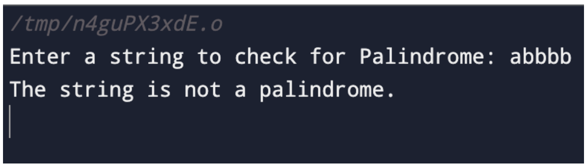
Source:

```
#include <iostream>
#include <string>
using namespace std;

int main()
{
  string str, temp;
  int i = 0, j;

  cout << "Enter a string to check for Palindrome: ";
  cin >> str;

  temp = str;

  j = str.length() - 1;

        //Reversing the temp string.

  while (i < j)
  {
    swap(str[i], str[j]);
    i++;
    j--;
  }

  if (temp == str)
  {
    cout << "The string is a palindrome." << endl;
  }
  else
  {
    cout << "The string is not a palindrome." << endl;
  }

  return 0;
}
```

Output:



```
/tmp/n4guPX3xdE.o
Enter a string to check for Palindrome
The string is a palindrome.
```



```
/tmp/n4guPX3xdE.o
Enter a string to check for Palindrome: abbbb
The string is not a palindrome.
```