

# C++ Programming

## Lab Manual 3

Home Task

Name: Hassan Aun Ali

CMS: 463654

Section B

Q1) Taking province as user input and outputting its population using switch-case.

```
#include <iostream>

using namespace std;

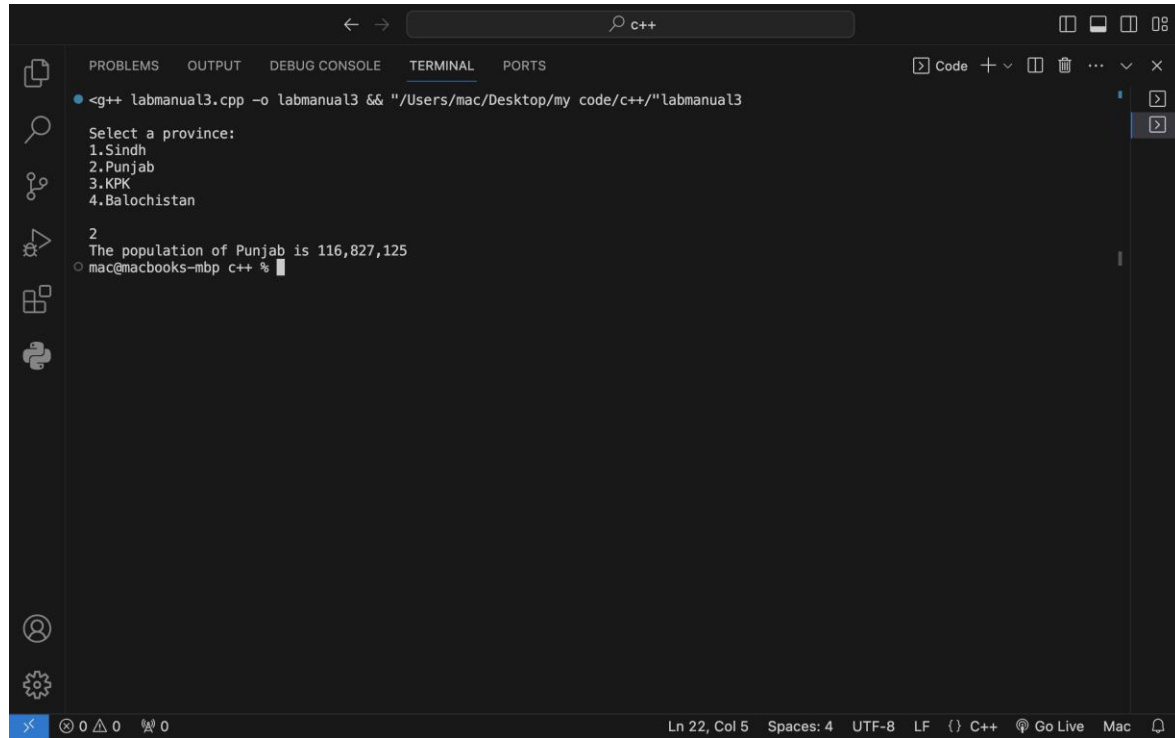
int main(){

    int province;

    cout<<"\nSelect a province: \n1.Sindh\n2.Punjab\n3.KPK\n4.Balochistan\n"<<endl;
    cin>>province;

    switch (province){
    case 1 : cout<<"The population of Sindh is 54,858,515"<<endl;
    break;
    case 2 : cout<<"The population of Punjab is 116,827,125"<<endl;
    break;
    case 3 : cout<<"The population of KPK is 39,372,462"<<endl;
    break;
    case 4 : cout<<"The population of Balochistan is 20,094,659"<<endl;
    break;
    }
```

## Output:



The screenshot shows a terminal window with the following content:

```
<g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
```

Select a province:  
1.Sindh  
2.Punjab  
3.KPK  
4.Balochistan

2  
The population of Punjab is 116,827,125

mac@macbooks-mbp c++ %

The terminal window has a dark theme and a sidebar on the left with icons for Explorer, Search, Source Control, Run and Debug, Extensions, and Settings. The top bar shows the file name 'c++' and various window controls. The bottom status bar indicates the current line and column (Ln 22, Col 5), spaces (4), encoding (UTF-8), line feed (LF), and the active language (C++).

Q2)Determining whether an inputted alphabet is a vowel or a consonant using switch-case statements

```
char alphabet;
cout<<"Enter an alphabet: "<<endl;
cin>>alphabet;
alphabet = tolower(alphabet);

if (alphabet >= 'a' && alphabet <= 'z'){
    switch (alphabet){
        case 'a':case 'e':case 'i':case 'o':case 'u':
            cout<<"Alphabet is a vowel"<<endl;
            break;
        default: cout<<"Alphabet is a consonant"<<endl;
            break;
    }
}
else{
    cout<<"Invalid Syntax"<<endl;
}
```

Output:

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter an alphabet:
u
Alphabet is a vowel
mac@macbooks-mbp c++ %
```

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter an alphabet:
w
Alphabet is a consonant
mac@macbooks-mbp c++ %
```

Q3) Taking a number as an input from user and determining if it is equal, greater or less than zero using switch case statements.

```
int number;
```

```
int s;

cout<<"Enter a number: "<<endl;
cin>>number;

if (number > 0){
    s = 1;
}
else if (number == 0){
    s = 0;
}
else if (number < 0 ){
    s = -1;
}
else{
    cout<<"Invalid Syntax"<<endl;
}

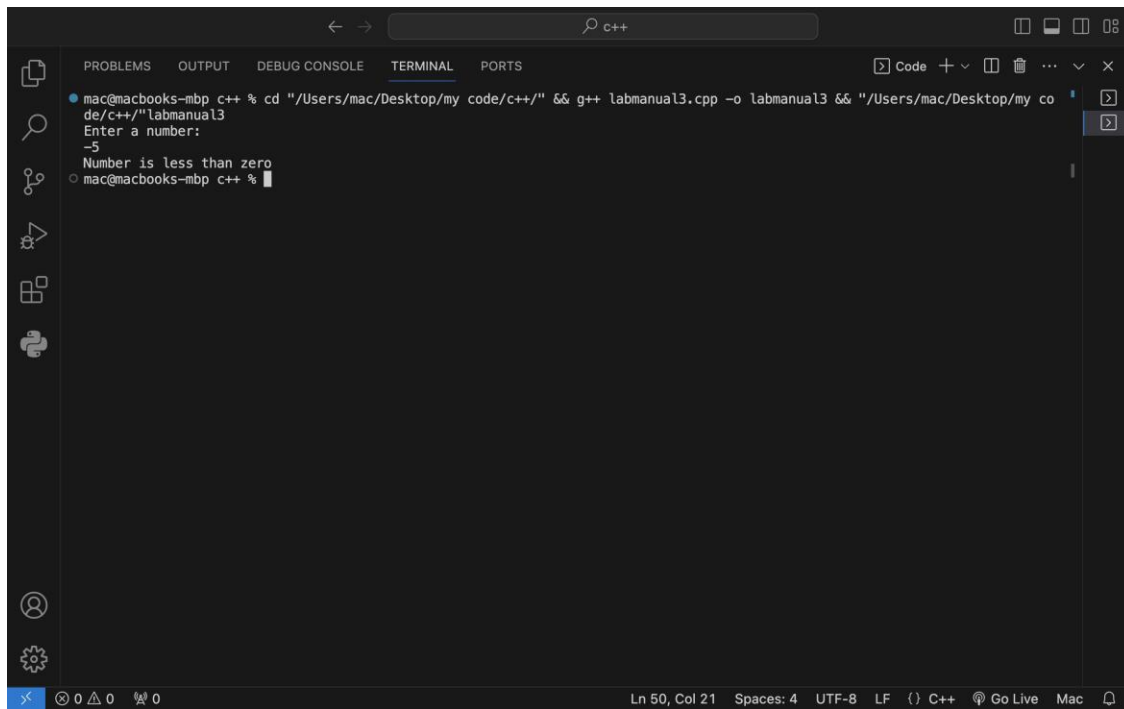
switch (s){
    case 1 : cout<<"Number is greater than zero"<<endl;
    break;
    case 0 : cout<<"Number is equal to zero"<<endl;
    break;
    case -1 : cout<<"Number is less than zero"<<endl;
    break;
}
```

**Output:**

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter a number:
3
Number is greater than zero
mac@macbooks-mbp c++ %
```

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter a number:
0
Number is equal to zero
mac@macbooks-mbp c++ %
```





The image shows a Visual Studio Code interface with a terminal window open. The terminal displays the following text:

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter a number:
-5
Number is less than zero
mac@macbooks-mbp c++ %
```

The terminal window is titled "c++" and has tabs for "PROBLEMS", "OUTPUT", "DEBUG CONSOLE", "TERMINAL", and "PORTS". The "TERMINAL" tab is active. The status bar at the bottom indicates "Ln 50, Col 21", "Spaces: 4", "UTF-8", "LF", "C++", "Go Live", and "Mac".

Q4) Determining whether a person is a child, teenager or an adult using nested if-else.

```
int age;

cout<<"Enter an age: "<<endl;
cin>>age;

if (age > 0){
    if (age < 13)
        cout<<"Person is a child"<<endl;
    else{
        if (age < 20)
            cout<<"Person is a teenager"<<endl;
        else{
            if (age<100)
                cout<<"Person is an adult"<<endl;
            else{
                cout<<"Age cannot be greater than 100"<<endl;
            }
        }
    }
}

else{
    cout<<"Invalid Syntax"<<endl;
}
```

## Output:

The image displays two screenshots of a Visual Studio Code terminal window, showing the execution of a C++ program. The terminal output is as follows:

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter an age:
34
Person is an adult
mac@macbooks-mbp c++ %
```

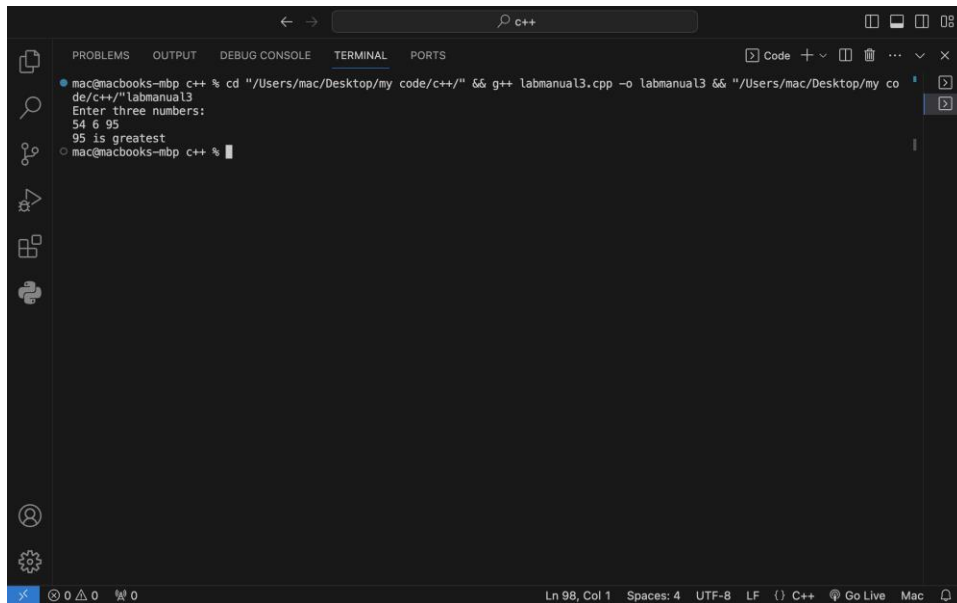
The first screenshot shows the program output for an input age of 34, resulting in "Person is an adult". The second screenshot shows the program output for an input age of 4, resulting in "Person is a child".

Q5) Taking three inputs from user and outputting greater one using nested if-else.

```
int a,b,c;  
cout<<"Enter three numbers: "<<endl;  
cin>>a>>b>>c;
```

```
if (a > b){  
    if (a > c)  
        cout<<a<<" is greatest"<<endl;  
    else{  
        if (b > c)  
            cout<<b<<" is greatest"<<endl;  
        else{  
            cout<<c<<" is greatest"<<endl;  
        }  
    }  
}  
else{  
    if (b > c)  
        cout<<b<<" is greatest"<<endl;  
    else{  
        cout<<c<<" is greatest"<<endl;  
    }  
}
```

## Output:



The image shows a screenshot of a Visual Studio Code (VS Code) terminal window. The terminal is running a C++ program. The output of the program is as follows:

```
mac@macbooks-mbp c++ % cd "/Users/mac/Desktop/my code/c++/" && g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter three numbers:
54 6 95
95 is greatest
mac@macbooks-mbp c++ %
```

The terminal window has a dark theme. The top bar shows the search icon and the text "c++". The left sidebar contains icons for Explorer, Search, Source Control, Run and Debug, Extensions, and Settings. The bottom status bar shows "Ln 98, Col 1", "Spaces: 4", "UTF-8", "LF", "C++", "Go Live", and "Mac".

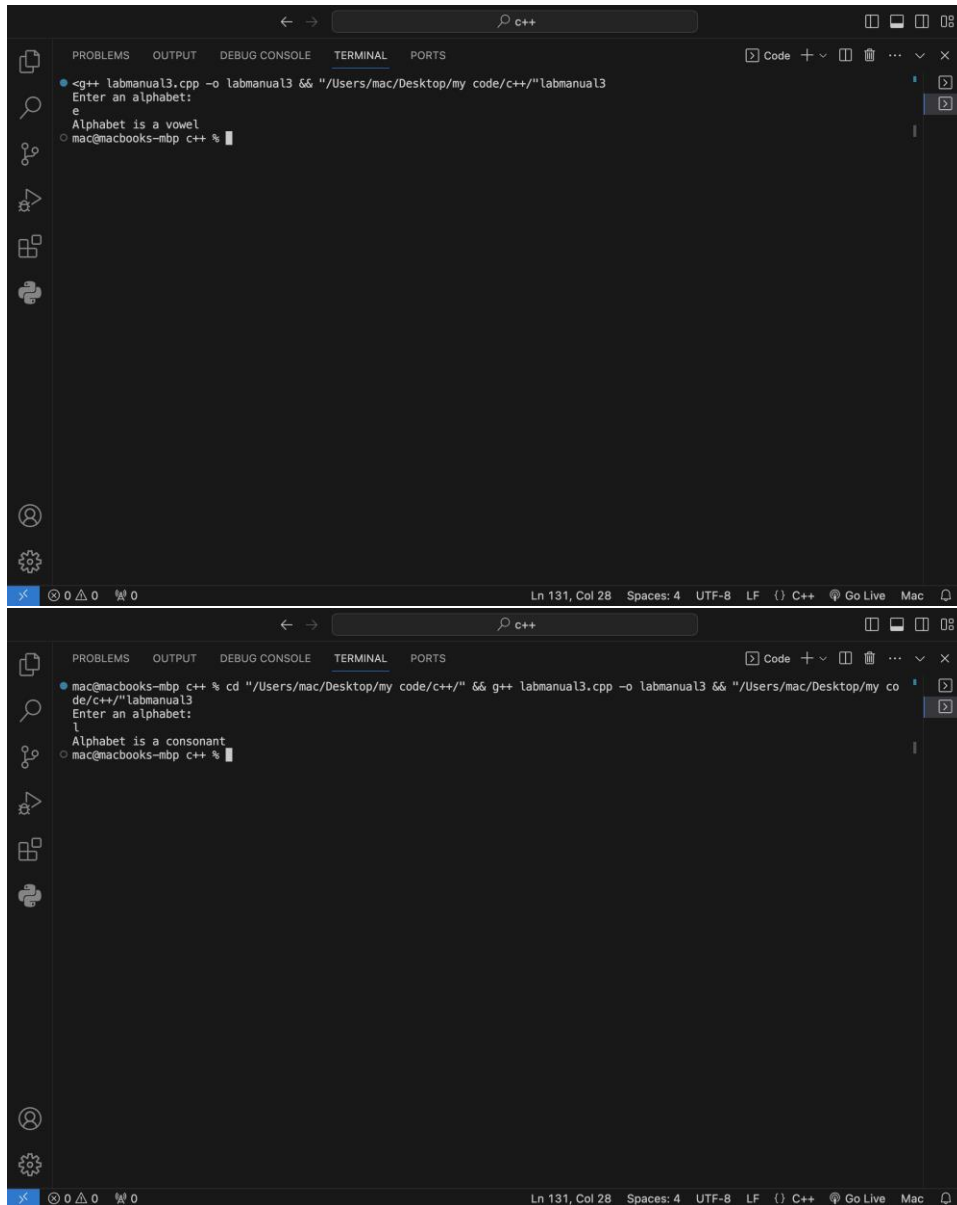
Q6) Determining whether an input alphabet is a vowel or a consonant using nested if-else.

```
char alpha;
cout<<"Enter an alphabet: "<<endl;
cin>>alpha;
alpha = tolower(alpha);

if (alpha >= 'a' && alpha <= 'z'){
    if (alpha == 'a') //checking vowels
        cout<<"Alphabet is a vowel"<<endl;
    else{
        if (alpha == 'e')
            cout<<"Alphabet is a vowel"<<endl;
        else{
            if (alpha == 'i')
                cout<<"Alphabet is a vowel"<<endl;
            else{
                if (alpha == 'o')
                    cout<<"Alphabet is a vowel"<<endl;
                else{
                    if (alpha == 'u')
                        cout<<"Alphabet is a vowel"<<endl;
                    else{
                        cout<<"Alphabet is a consonant"<<endl; //alphabet consonat
                    }
                }
            }
        }
    }
}
```

```
}  
}  
}  
}  
}  
else{  
cout<<"Invalid Syntax"<<endl; //this will output if user input is anything other than an alphabet  
}  
}
```

## Output:



The image displays two screenshots of a Visual Studio Code terminal window, showing the execution of a C++ program. The terminal has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and PORTS. The first screenshot shows the program being compiled and run with the input 'e', resulting in the output 'Alphabet is a vowel'. The second screenshot shows the program being compiled and run with the input 'l', resulting in the output 'Alphabet is a consonant'.

```
mac@macbooks-mbp ~ % g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter an alphabet:
e
Alphabet is a vowel
mac@macbooks-mbp ~ % g++ labmanual3.cpp -o labmanual3 && "/Users/mac/Desktop/my code/c++/"labmanual3
Enter an alphabet:
l
Alphabet is a consonant
mac@macbooks-mbp ~ %
```