**Q1**- An electricity board charges the following rates to domestic users to discourage large consumption of energy. For the first 100 units: - 60 P per unit For the next 200 units: -80 P per unit Beyond 300 units: -90 P per unit All users are charged a minimum of Rs 50 if the total amount is more than Rs 300 then an additional surcharge of 15% is added. Implement a C++ program to read the names of users and number of units consumed and display the charges with names.

**SOURCE CODE -**

#include <iostream>

using namespace std;

int main()

{

string name;

int units;

cout << "ENTER THE NAME - ";

getline(cin, name);

cout << "ENTER THE NUMBER OF UNITS CONSUMED - ";

cin >> units;

double bill;

bill = 50;

if (units <= 100)

{

bill += .6 \* units;

}

else if (units > 100 && units <= 300)

{

bill += 100 \* .6 + (units - 200) \* .8;

}

else if (units > 300)

{

bill += (100 \* .6) + (200 \* .8) + ((units - 300) \* .9);

}

if (bill > 300)

bill += bill \* .15;

cout << "NAME - " << name << endl

<< "UNITS CONSUMED - " << units << endl

<< "BILL - " << bill;

}

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> g++ q1.cpp

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> ./a.exe

ENTER THE NAME - Daksh

ENTER THE NUMBER OF UNITS CONSUMED - 20

NAME - Daksh

UNITS CONSUMED - 20

BILL - 62

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC D1, ROLL NO. - 22>

**Q2-** Construct a C++ program that removes a specific character from a given string and return the updated string. Typical Input: computer science is the future.

**SOURCE CODE -**

#include <iostream>

using namespace std;

int main()

{

string str;

char a;

string res;

cout << "ENTER A STRING - ";

getline(cin, str);

cout << "ENTER THE CHARACHTER TO BE REMOVED - ";

cin >> a;

for (int i = 0; i < str.length(); i++)

{

if (str[i] != a)

res += str[i];

}

cout << res << endl;

}

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC b1, ROLL NO. - 22> g++ q2.cpp

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> ./a.exe

ENTER A STRING - computer science is the future

ENTER THE CHARACHTER TO BE REMOVED - t

compuer science is he fuure

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22>

**Q3-** Implement a C++ program to find the non-repeating characters in string.

**SOURCE CODE -**

#include <iostream>

using namespace std;

int main()

{

string str = "";

cout << "ENTER THE STRING - ";

getline(cin, str);

int c = 0;

for (int i = 0; i < str.length(); i++)

{

for (int j = 0; j < str.length(); j++)

{

if (str[i] == str[j])

c++;

}

if (c == 1)

cout<<str[i]<<" ";

c=0;

}

}

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22> g++ q3.cpp

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22> ./a.exe

ENTER THE STRING - graphic era university

g p h c u n v s t y

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22>

**Q4.** You are given an array of elements. Now you need to choose the best index of this array. An index of the array is called best if the special sum of this index is maximum across the special sum of all the other indices. To calculate the special sum for any index you pick the first element that is and add it to your sum. Now you pick next two elements i.e., and and add both of them to your sum. Now you will pick the next elements, and this continues till the index for which it is possible to pick the elements. Find the best index and in the output print its corresponding special sum. Note that there may be more than one best index, but you need to only print the maximum special sum.

**SOURCE CODE -**

#include <iostream>

using namespace std;

int main()

{

int n;

cout << "ENTER THE SIZE OF THE ARRAY - ";

cin >> n;

int a[n];

int c = 1;

int currentSum = 0;

int maxSum = 0;

int maxSumIndex = 0;

for (int i = 0; i < n; i++)

{

cout << "ENTER THE ARRAY ELEMENTS - ";

cin >> a[i];

}

for (int i = 0; i < n; i++)

{

for (int j = i; n - j >= c; j += c - 1)

{

for (int k = j; k < j + c; k++)

{

currentSum += a[k];

}

c++;

}

c = 1;

if (currentSum > maxSum)

{

maxSum = currentSum;

maxSumIndex = i;

}

currentSum = 0;

}

cout << maxSum << "\n"

<< maxSumIndex;

**}**

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC D1, ROLL NO. - 22> g++ q4.cpp

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> ./a.exe

ENTER THE SIZE OF THE ARRAY - 5

ENTER THE ARRAY ELEMENTS - 1

ENTER THE ARRAY ELEMENTS - 3

ENTER THE ARRAY ELEMENTS - 1

ENTER THE ARRAY ELEMENTS - 2

ENTER THE ARRAY ELEMENTS - 5

8

2

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22>

**Q5.** Implement a C++ program to demonstrate the concept of data abstraction using the concept of Class and Objects.

**SOURCE CODE -**

#include <iostream>

using namespace std;

class abstract

{

private:

int a, b;

public:

void set(int x, int y)

{

a = x;

b = y;

}

void display()

{

cout << "a = " << a << endl;

cout << "b = " << b << endl;

}

};

int main()

{

abstract obj;

obj.set(10, 20);

obj.display();

}

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> g++ q5.cpp

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC B1, ROLL NO. - 22> ./a.exe

a = 10

b = 20

PS C:\Users\admin\Desktop\vscode\MANAS NAUTIYAL, SEC D1, ROLL NO. - 36>

**Q6**. Define a class Hotel in C++ with the following specifications Private members • Rno Data member to store room number • Name Data member to store customer name • Tariff Data member to store per day charges • NOD Data member to store number of days of stay • CALC() Function to calculate and return amount as NOD\*Tariff ,and if the value of days\* Tariff >10000, then total amount is 1.05\* days\*Tariff. Public members • Checkin() Function to enter the content Rno, Name, Tariff and NOD • Checkout() Function to display Rno, Name, Tariff, NOD and Amount (amount to be displayed by calling function) CALC().

**SOURCE CODE -**

#include <iostream>

using namespace std;

class hotel

{

private:

int rno;

string name;

int tariff;

int NOD;

double calc()

{

if (tariff \* NOD > 10000)

return tariff \* NOD \* 1.05;

else

return tariff \* NOD;

}

public:

void checkin()

{

cout << "ENTER THE ROOM NO. - ";

cin >> rno;

getchar();

cout << "ENTER THE NAME OF THE GUEST - ";

getline(cin, name);

cout << "ENTER THE TARIFF - ";

cin >> tariff;

cout << "ENTER THE DURATION OF STAY - ";

cin >> NOD;

}

void checkout()

{

cout << endl << "BILL- " << calc() << endl;

cout << "ROOM NUMBER - " << rno << endl;

cout << "NAME - " << name << endl;

cout << "TARIFF - " << tariff << endl;

cout << "NUMBER OF DAYS - " << NOD << endl;

}

};

int main()

{

hotel h;

h.checkin();

h.checkout();

}

**OUTPUT -**

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22> g++ q6.cpp

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22> ./a.exe

ENTER THE ROOM NO. - 101

ENTER THE NAME OF THE GUEST - Manas

ENTER THE TARIFF - 500

ENTER THE DURATION OF STAY - 5

BILL- 2500

ROOM NUMBER - 101

NAME - Manas

TARIFF - 500

NUMBER OF DAYS - 5

PS C:\Users\admin\Desktop\vscode\DAKSH GAUTAM, SEC B1, ROLL NO. - 22>