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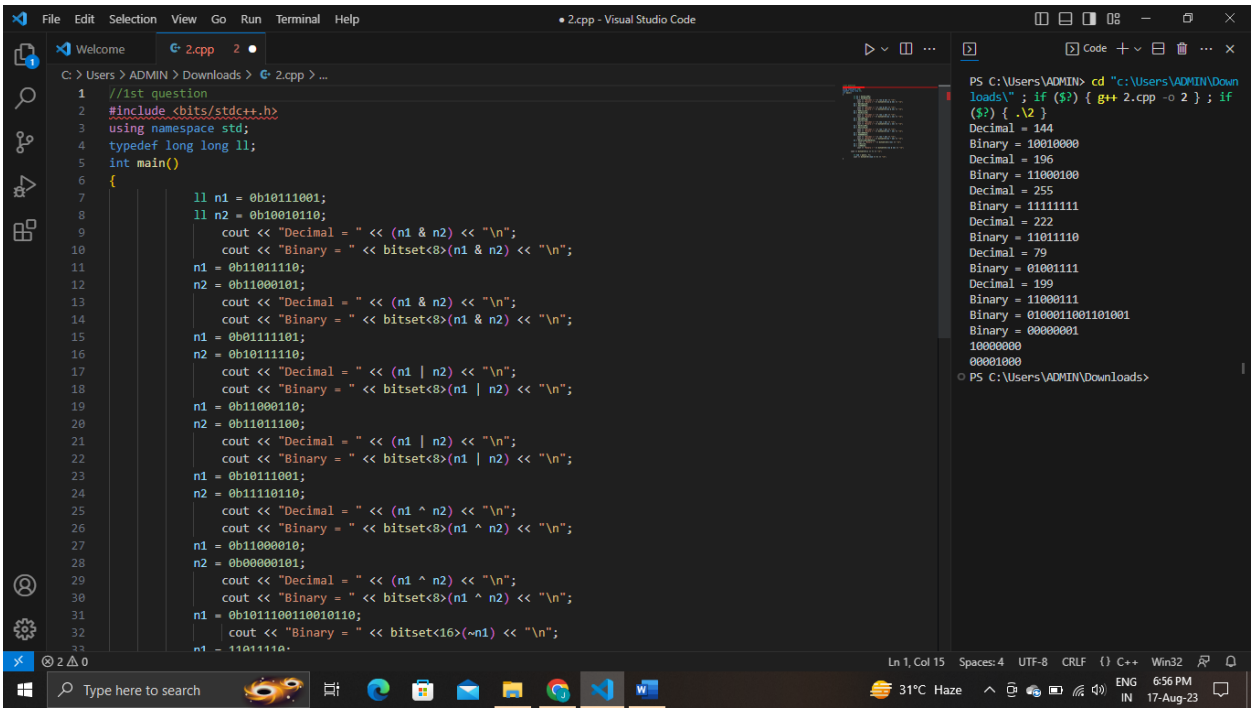
Student ID:-202312090 (IT603)-Programming

1).

```
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
int main()
{
        ll n1 = 0b10111001;
        ll n2 = 0b10010110;
           cout << "Decimal = " << (n1 & n2) << "\n";
           cout << "Binary = " << bitset<8>(n1 & n2) << "\n";
        n1 = 0b11011110;
        n2 = 0b11000101;
           cout << "Decimal = " << (n1 & n2) << "\n";
           cout << "Binary = " << bitset<8>(n1 & n2) << "\n";
        n1 = 0b01111101;
        n2 = 0b10111110;
           cout << "Decimal = " << (n1 | n2) << "\n";
           cout << "Binary = " << bitset<8>(n1 | n2) << "\n";
        n1 = 0b11000110;
        n2 = 0b11011100;
           cout << "Decimal = " << (n1 | n2) << "\n";
           cout << "Binary = " << bitset<8>(n1 | n2) << "\n";
        n1 = 0b10111001;
        n2 = 0b11110110;
           cout << "Decimal = " << (n1 ^ n2) << "\n";
```

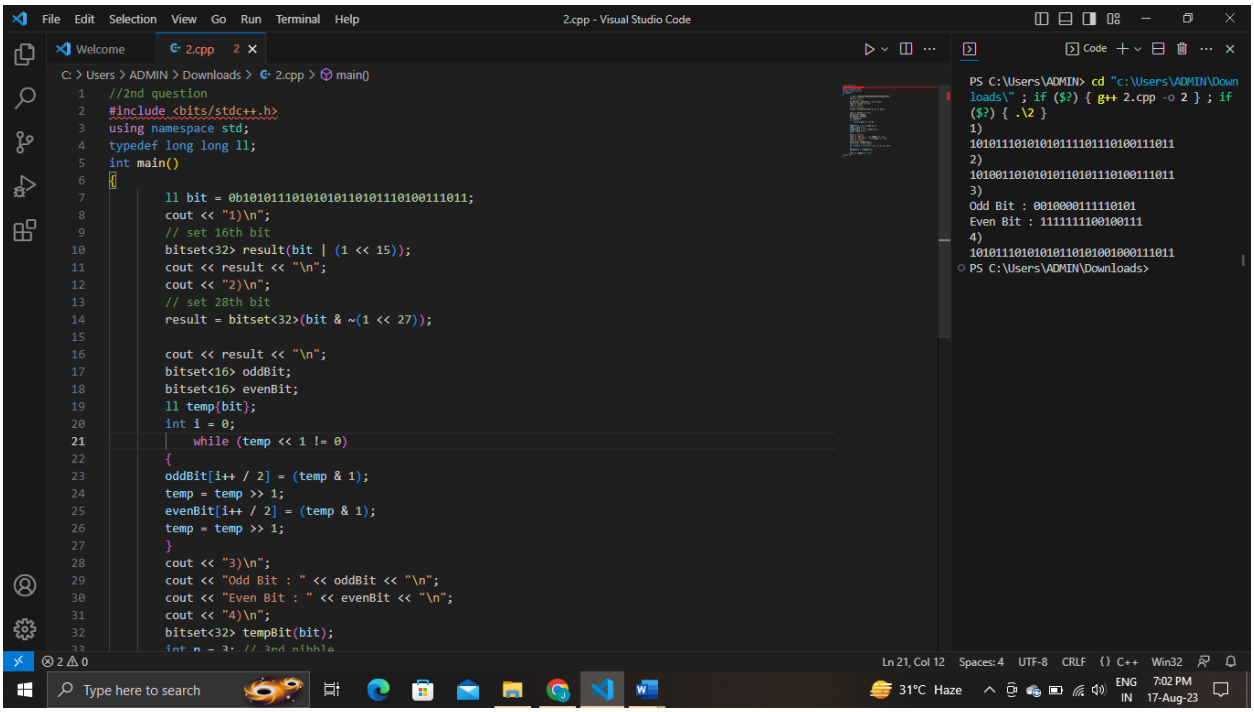
```
    cout << "Binary = " << bitset<8>(n1 ^ n2) << "\n";
  n1 = 0b11000010;
  n2 = 0b00000101;
    cout << "Decimal = " << (n1 ^ n2) << "\n";
    cout << "Binary = " << bitset<8>(n1 ^ n2) << "\n";
  n1 = 0b1011100110010110;
     cout << "Binary = " << bitset<16>(~n1) << "\n";
  n1 = 11011110;
  n2 = 11000101;
    cout << "Binary = " << bitset<8>(~n1 & n2) << "\n";

 cout << bitset<8>(1 << 7) << "\n";

  ll num = pow(2, 7);
  cout << bitset<8>(num >> 4) << "\n";
}
```



2).

```
//2nd question
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
int main()
{
    ll bit = 0b10101110101010110101110100111011;
    cout << "1)\n";
    // set 16th bit
    bitset<32> result(bit | (1 << 15));
    cout << result << "\n";
    cout << "2)\n";
    // set 28th bit
    result = bitset<32>(bit & ~(1 << 27));

    cout << result << "\n";
    bitset<16> oddBit;
    bitset<16> evenBit;
    ll temp{bit};
    int i = 0;
      while (temp << 1 != 0)
    {
    oddBit[i++ / 2] = (temp & 1);
    temp = temp >> 1;
    evenBit[i++ / 2] = (temp & 1);
    temp = temp >> 1;
    }
    cout << "3)\n";
```

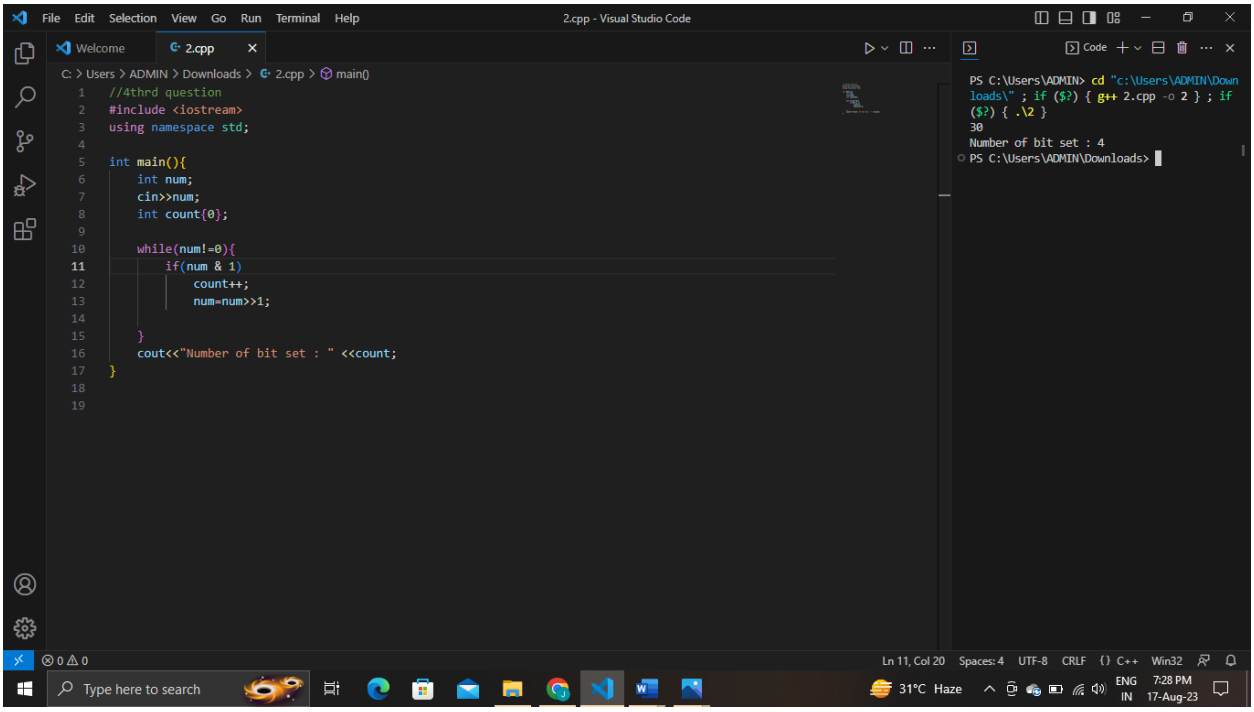
```
    cout << "Odd Bit : " << oddBit << "\n";
    cout << "Even Bit : " << evenBit << "\n";
    cout << "4)\n";
    bitset<32> tempBit(bit);
    int n = 3; // 3rd nibble
    for (size_t i = 4 * (n - 1); i < 4 * n; i++)
    {
    tempBit[i] = ~tempBit[i];
    }
    cout << tempBit << "\n";
return 0;
}
```



3).

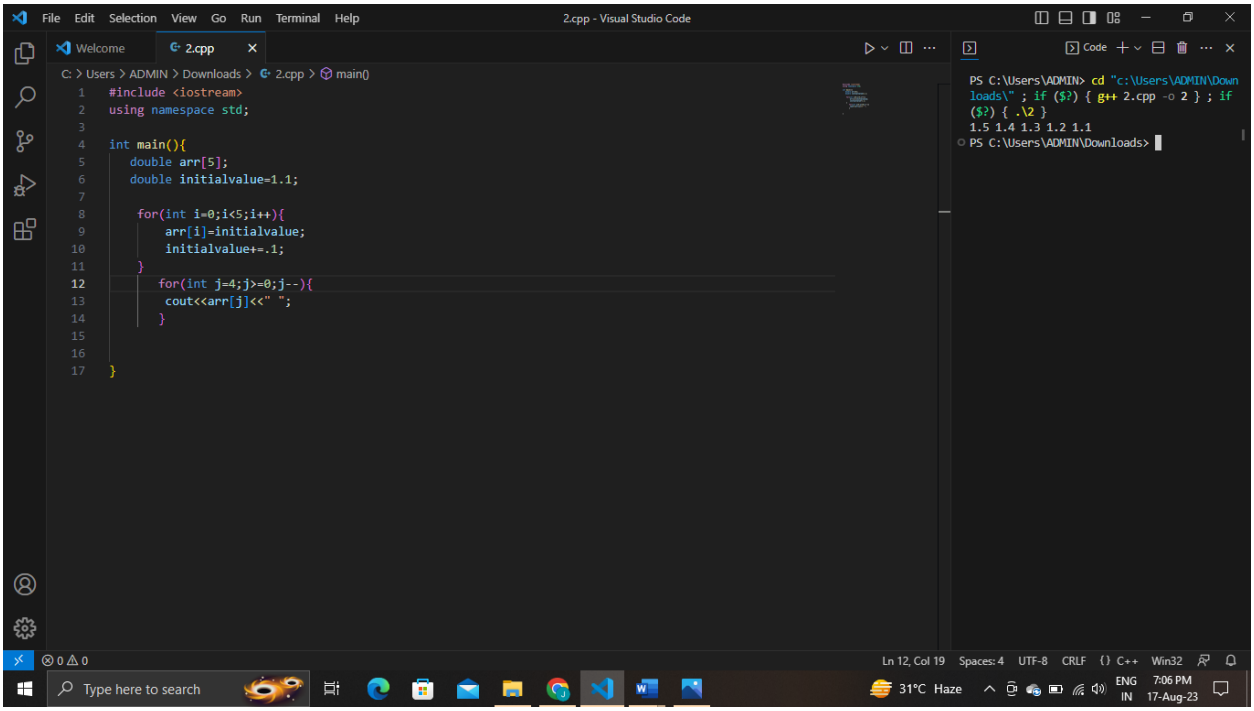
```
//4thrd question
#include <iostream>
using namespace std;
```

```
int main(){
    int num;
    cin>>num;
    int count{0};

    while(num!=0){
        if(num & 1)
            count++;
            num=num>>1;

    }
    cout<<"Number of bit set : " <<count;
}
```



6).

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

int main(){
  double arr[5];
  double initialvalue=1.1;

   for(int i=0;i<5;i++){
       arr[i]=initialvalue;
       initialvalue+=.1;
   }
      for(int j=4;j>=0;j--){
       cout<<arr[j]<<" ";
      }


}
```



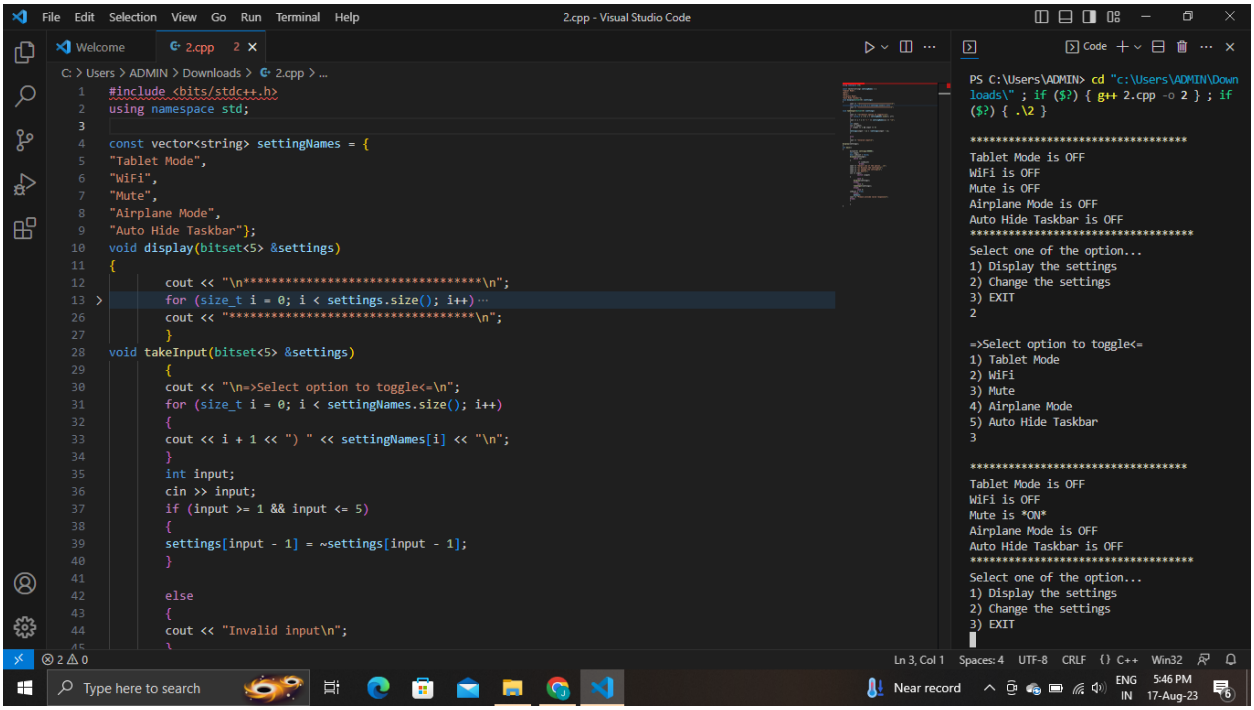
4).

```
#include <bits/stdc++.h>
using namespace std;
const vector<string> settingNames = {
"Tablet Mode",
"WiFi",
"Mute",
"Airplane Mode",
"Auto Hide Taskbar"};
void display(bitset<5> &settings)
{
cout << "\n==================================\n";
for (size_t i = 0; i < settings.size(); i++)
{
if (settings[i])
{
```

```
cout << settingNames[i];
cout << " is *ON*\n";
}
else
{
cout << settingNames[i];
cout << " is OFF\n";
}
}
cout << "==================================\n";
}
void takeInput(bitset<5> &settings)
{
cout << "\n=>Select option to toggle<=\n";
for (size_t i = 0; i < settingNames.size(); i++)
{
cout << i + 1 << ") " << settingNames[i] << "\n";
}
int input;
cin >> input;
if (input >= 1 && input <= 5)
{
settings[input - 1] = ~settings[input - 1];
}
else
{
cout << "Invalid input\n";
}
display(settings);
```

```
}
int main()
{
bitset<5> settings(00000);
int input;
bool isExist = false;
display(settings);
while (1)
{
if (isExist)
break;
cout << "Select one of the option...\n";
cout << "1) Display the settings\n";
cout << "2) Change the settings\n";
cout << "3) EXIT\n";
cin >> input;
switch (input)
{
case 1:
display(settings);
break;
case 2:
takeInput(settings);
break;
case 3:
isExist = true;
break;
default:
cout << "Please provide valid response\n";
```

```
break;
}
}
}
```



5).

```
#include <iostream>
using namespace std;
typedef unsigned int uint;
void print(int num)
{
cout << "\nValues Selected : \n\n";
int temp = 0;
while (temp < 12)
{
if ((temp + 1) == 1)
{
```

```
if (num & 1)
cout << "Seat Covers";
}
else if ((temp + 1) == 2)
{
if (num & 1)
cout << " : Beige ";
}
else if ((temp + 1) == 3)
{
if (num & 1)
cout << " : Dark ";

}
else if ((temp + 1) == 4)
{
if (num & 1)
cout << " : Dual Pattern ";
}
else if ((temp + 1) == 5)
{
if (num & 1)
cout << "\n"
<< "Alloys";
}
else if ((temp + 1) == 6)
{
if (num & 1)
cout << "\n"
```

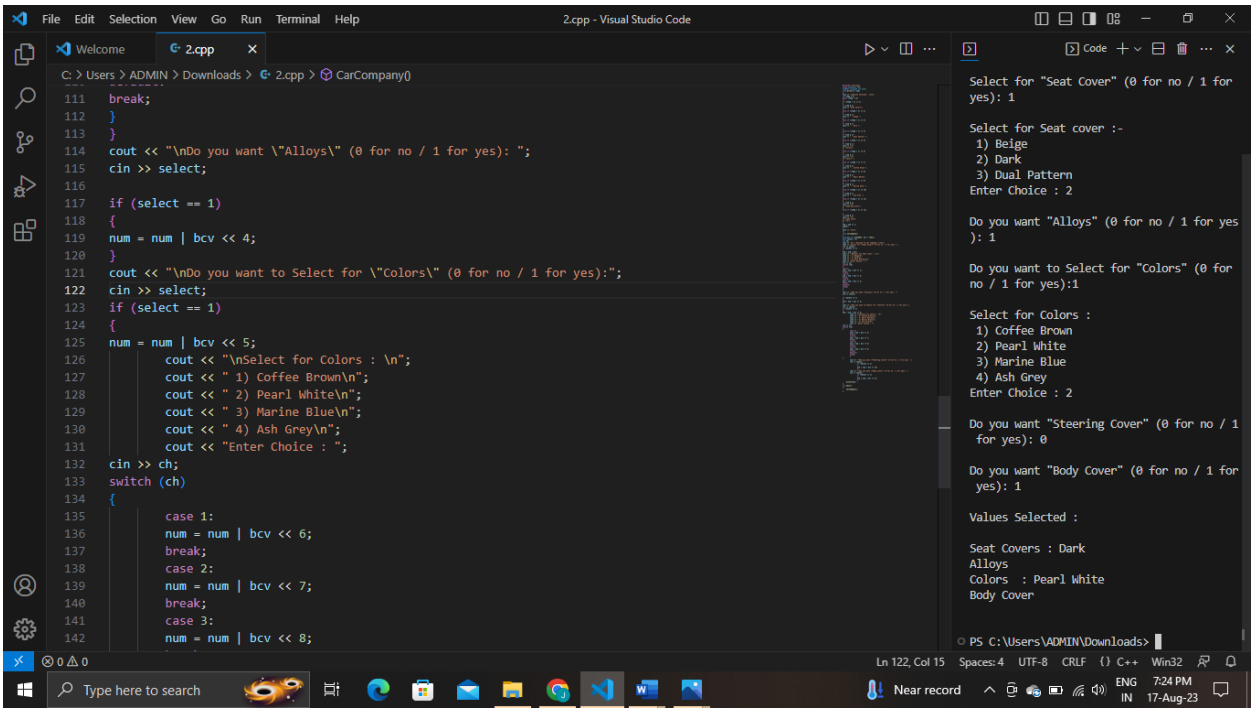
```
<< "Colors ";
}
else if ((temp + 1) == 7)
{
if (num & 1)
cout << " : Coffee Brown ";
}
else if ((temp + 1) == 8)
{
if (num & 1)
cout << " : Pearl White";
}
else if ((temp + 1) == 9)
{
if (num & 1)
cout << " : Marine Blue ";
}
else if ((temp + 1) == 10)
{
if (num & 1)
cout << " : Ash Grey ";
}
else if ((temp + 1) == 11)
{
if (num & 1)
cout << "\n"
<< "Steering Cover";
}
else if ((temp + 1) == 12)
```

```
{
if (num & 1)
cout << "\n"
<< "Body Cover"
<< "\n";
}
num = num >> 1;
temp++;
}
cout << "\n\n";
}
void CarCompany()
{
unsigned int num{0b0}, bcv = {0b1};
bool select = 0;
int ch;
cout << "\n--- Welcome To Car Company---\n\n";
cout << "Select for \"Seat Cover\" (0 for no / 1 for yes): ";
cin >> select;
if (select == 1)
{
num = num | bcv;
cout << "\nSelect for Seat cover :- \n";
cout << " 1) Beige\n";
cout << " 2) Dark\n";
cout << " 3) Dual Pattern\n";
cout << "Enter Choice : ";
cin >> ch;
```

```
switch (ch)
{
case 1:
num = num | bcv << 1;
break;
case 2:
num = num | bcv << 2;
break;
case 3:
num = num | bcv << 3;
break;
default:
break;
}
}
cout << "\nDo you want \"Alloys\" (0 for no / 1 for yes): ";
cin >> select;

if (select == 1)
{
num = num | bcv << 4;
}
cout << "\nDo you want to Select for \"Colors\" (0 for no / 1 for yes):";
cin >> select;
if (select == 1)
{
num = num | bcv << 5;
      cout << "\nSelect for Colors : \n";
      cout << " 1) Coffee Brown\n";
```

```
        cout << " 2) Pearl White\n";
        cout << " 3) Marine Blue\n";
        cout << " 4) Ash Grey\n";
        cout << "Enter Choice : ";
cin >> ch;
switch (ch)
{
        case 1:
        num = num | bcv << 6;
        break;
        case 2:
        num = num | bcv << 7;
        break;
        case 3:
        num = num | bcv << 8;
        break;
        case 4:
        num = num | bcv << 9;
        break;
        default:
        break;
        }
}
        cout << "\nDo you want \"Steering Cover\" (0 for no / 1 for yes): ";
        cin >> select;
                if (select == 1)
                {
                num = num | bcv << 10;
                }
```

```
    cout << "\nDo you want \"Body Cover\" (0 for no / 1 for yes): ";
    cin >> select;
        if (select == 1)
        {
        num = num | bcv << 11;
        }
  print(num);
}
int main()
{
  CarCompany();
}
```



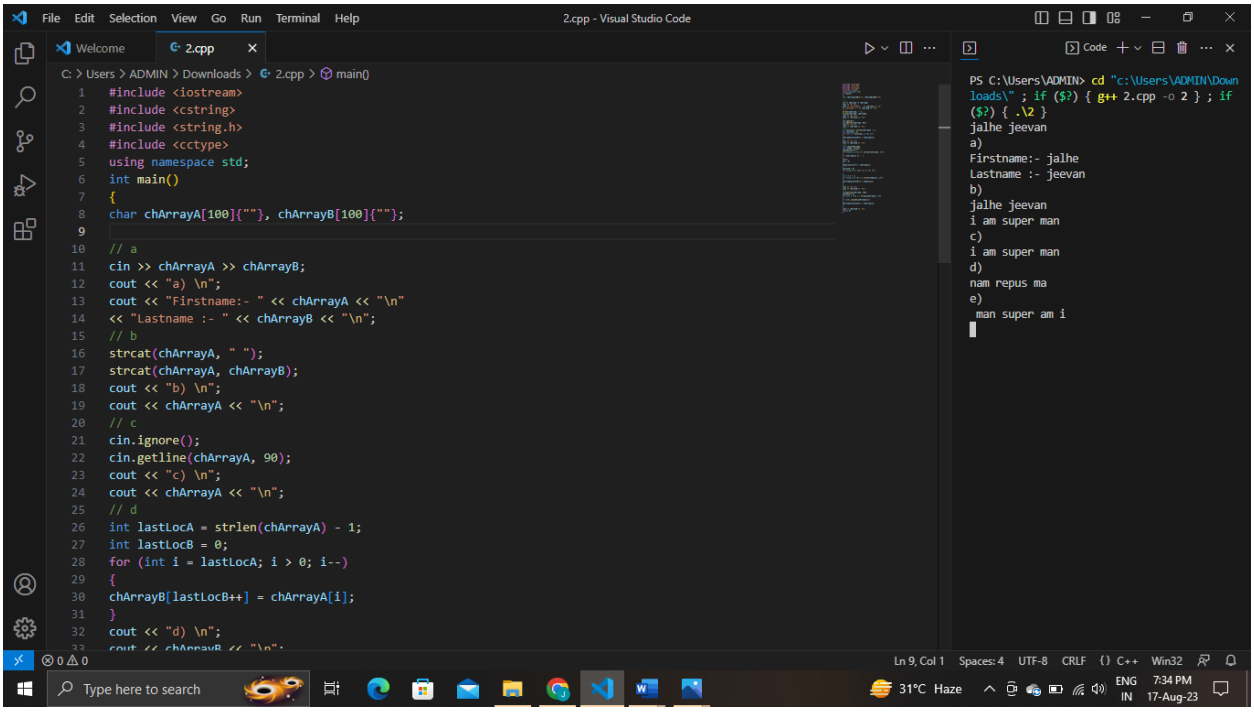
7).

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

```
#include <cctype>
using namespace std;
int main()
{
char chArrayA[100]{""}, chArrayB[100]{""};
// a
cin >> chArrayA >> chArrayB;
cout << "a) \n";
cout << "Firstname:- " << chArrayA << "\n"
<< "Lastname :- " << chArrayB << "\n";
// b
strcat(chArrayA, " ");
strcat(chArrayA, chArrayB);
cout << "b) \n";
cout << chArrayA << "\n";
// c
cin.ignore();
cin.getline(chArrayA, 90);
cout << "c) \n";
cout << chArrayA << "\n";
// d
int lastLocA = strlen(chArrayA) - 1;
int lastLocB = 0;
for (int i = lastLocA; i > 0; i--)
{
chArrayB[lastLocB++] = chArrayA[i];
}
cout << "d) \n";
cout << chArrayB << "\n";
```

```
// e
char temp[100][100];
int row{0}, col{0};
temp[0][col++] = ' ';
for (size_t i = 0; i < strlen(chArrayA); i++)
{
if (chArrayA[i] == ' ')
{
row++;
col = 0;
}
temp[row][col++] = chArrayA[i];
}
lastLocB = 0;
for (size_t I = row + 1; I > 0; I--)
{
int i = I - 1;
for (size_t j = 0; j < strlen(temp[i]); j++)
{
chArrayB[lastLocB++] = temp[i][j];
}
}
cout << "e) \n";
cout << chArrayB << "\n";
// f
cin.getline(chArrayA, 100);
lastLocB = 0;
for (int i = 0; i < strlen(chArrayA); ++i)
{
```

```
if (std::isalpha(chArrayA[i]))
{
chArrayB[lastLocB++] = chArrayA[i];
}
}
cout << chArrayB << "\n";
return 0;
}
```



8).

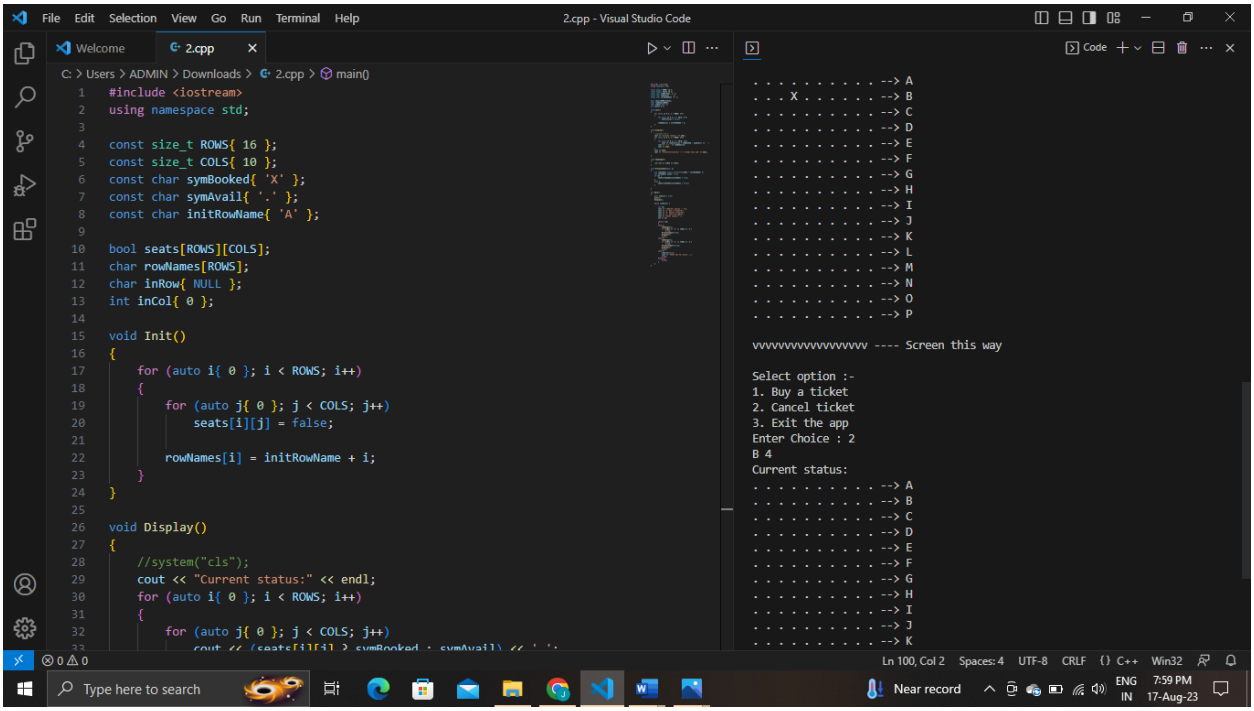
```
#include <iostream>
using namespace std;

const size_t ROWS{ 16 };
const size_t COLS{ 10 };
const char symBooked{ 'X' };
const char symAvail{ '.' };
const char initRowName{ 'A' };
```

```
bool seats[ROWS][COLS];
char rowNames[ROWS];
char inRow{ NULL };
int inCol{ 0 };

void Init()
{
   for (auto i{ 0 }; i < ROWS; i++)
   {
      for (auto j{ 0 }; j < COLS; j++)
         seats[i][j] = false;

      rowNames[i] = initRowName + i;
   }
}

void Display()
{
   //system("cls");
   cout << "Current status:" << endl;
   for (auto i{ 0 }; i < ROWS; i++)
   {
      for (auto j{ 0 }; j < COLS; j++)
         cout << (seats[i][j] ? symBooked : symAvail) << ' ';
      cout << "--> " << rowNames[i];
      cout << endl;
   }
   cout << endl;
```

```
    cout << "vvvvvvvvvvvvvvvvvv ---- Screen this way" << endl;

}

void TakeInput()
{
    std::cin >> inRow >> inCol;
}

void ProcessInput(bool n)
{
    int rowIndex{ static_cast<int>(inRow - initRowName) };
    int colIndex{ inCol - 1 };
    if (n) {
        seats[rowIndex][colIndex] = true;
    }
    else {
        seats[rowIndex][colIndex] = false;
    }

}

int main()
{
    bool isExist = true;
    Init();
    Display();

    while (isExist) {
```

```
int ch;
cout << "\nSelect option :- \n";
cout << "1. Buy a ticket\n";
cout << "2. Cancel ticket\n";
cout << "3. Exit the app\n";
cout << "Enter Choice : ";
cin >> ch;

switch (ch)
{
case 1:
   TakeInput();
   if (inRow == 'Q' || inRow == 'q')
      break;
   ProcessInput(true);
   Display();
   break;
case 2:
   TakeInput();
   if (inRow == 'Q' || inRow == 'q')
      break;
   ProcessInput(false);
   Display();
   break;
case 3:
   isExist=false;
   cout << "Thank You For Visit...";
   break;
```

```
        default:
            break;
        }
    }
}
```



9).

```
#include <bits/stdc++.h>
using namespace std;
vector<int> pendingOrders;
void placeOrder()
{
int orderNumber = 1 + pendingOrders.size();
pendingOrders.push_back(orderNumber);
cout << "==================================\n";
cout << "Your order is placed. Order Number:- " << orderNumber << "\n";
cout << "==================================\n";
```

```
cin.ignore();
}
void displayPendingOrders()
{
cout << "==================================\n";
cout << "Pending orders:- "
<< "\n";
for (int orderNumber : pendingOrders)
{
cout << "=> Order Number: " << orderNumber << "\n";
}
cout << "Total pending orders:- " << pendingOrders.size() << "\n";

cout << "==================================\n";
}
void serveOrder()
{
cout << "==================================\n";
cout << "Pending orders:\n";
for (int orderNumber : pendingOrders)
{
cout << "=> Order Number: " << orderNumber << "\n";
}
cout << "\nPick order: ";
int pickedOrder;
cin >> pickedOrder;
auto it = find(pendingOrders.begin(), pendingOrders.end(), pickedOrder);
if (it != pendingOrders.end())
{
```

```
pendingOrders.erase(it);
cout << "Order " << pickedOrder << " has been served.\n";
}
else
{
cout << "Invalid order number.\n";
}
cin.ignore();
cout << "================================\n";
}
int main()
{
int choice{0};
bool exit = false;
while (1)
{
if (exit)
break;
cout << "1) Place order\n2) Pending orders\n3) Serve order\n4) Exit\nEnter your pick: ";
cin >> choice;
switch (choice)
{
case 1:
placeOrder();
break;
case 2:

displayPendingOrders();
break;
```

case 3:

serveOrder();

break;

case 4:

exit = true;

break;

default:

cout << "Please enter valid choice."

<< "\n";

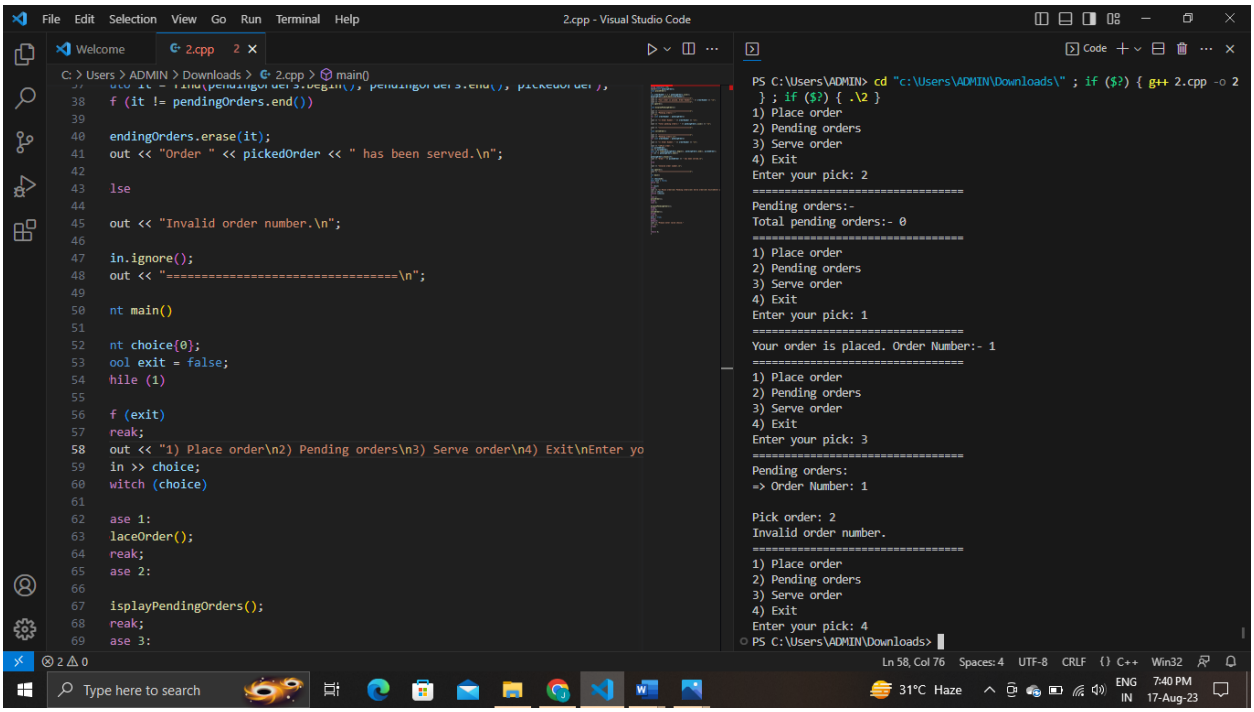
break;

}

}

return 0;

}



10).

#include <bits/stdc++.h>

using namespace std;

```
#define MAX 1000
int main()
{
int row, col;
cin >> row >> col;
char arr[MAX][MAX] = {0};
bool flg = 0;
for (int i = 0; i < row; i++)
{
for (int j = 0; j < col; j++)
{
arr[i][j] = '*';
}
}
int round = 0;
row--, col--;
while (1)
{
int col_limit = col - (round + 1), row_limit = row - (round + 1);
int x1 = round, y1 = round, x2 = round, y2 = col - round, x3 = row - round,
y3 = round, x4 = row - round, y4 = col - round;

if (y1 > y2 || y3 > y4 || x1 > x3 || x2 > x4)
break;
while (y1 <= col_limit)
arr[x1][y1++] = arr[x4][y4--] = '-';
while (x2 <= row_limit)
arr[x2++][y2] = arr[x3--][y3] = '-';
round += 2;
```

```
}
if (row == col && (row % 4) == 0)
{
arr[row / 2][col / 2] = '-';
}
for (int i = 0; i < row + 1; i++)
{
for (int j = 0; j < col + 1; j++)
{
cout << arr[i][j] << " ";
}
cout << endl;
}
}
```