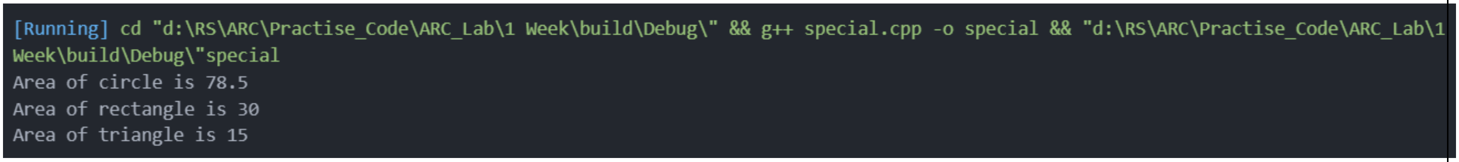
```
/*1 To calculate the area of circle, rectangle and triangle using function
overloading*/
#include<iostream>
using namespace std;
class Area
{
public:
   void area(int r)
   {
      cout << "Area of circle is " << 3.14 * r * r << endl;
   }
   void area(int l, int b)
   {
      cout << "Area of rectangle is " << l * b << endl;
   }
   void area(double b, double h)
   {
      cout << "Area of triangle is " << 0.5 * b * h << endl;
   }
};
int main()
{
   Area a;
   a.area(5);
   a.area(5, 6);
```

```
    a.area(5.0, 6.0);  // Use double values for the triangle area

    return 0;

}
```

Output:



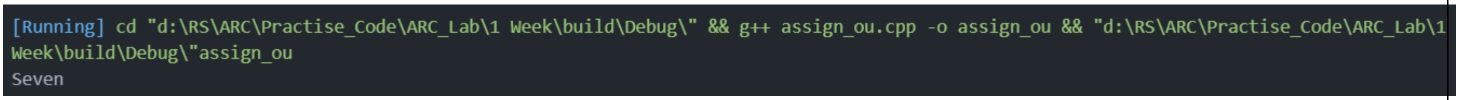
```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ special.cpp -o special && "d:\RS\ARC\Practise_Code\ARC_Lab\1
Week\build\Debug\"special
Area of circle is 78.5
Area of rectangle is 30
Area of triangle is 15
```

/*2 Prints the English name of an integer from 1 to 9*/

```
#include<iostream>

using namespace std;

class Number

{

public:

    void print(int n)

    {

        switch (n)

        {

        case 1:

            cout << "One" << endl;

            break;

        case 2:

            cout << "Two" << endl;

            break;

        case 3:

            cout << "Three" << endl;

            break;
        case 4:
            cout << "Four" << endl;
            break;
        case 5:
            cout << "Five" << endl;
            break;
        case 6:
            cout << "Six" << endl;
            break;
        case 7:
            cout << "Seven" << endl;
            break;
        case 8:
            cout << "Eight" << endl;
            break;
        case 9:
            cout << "Nine" << endl;
            break;
        default:
            cout << "Invalid input" << endl;
        }
    }
};

int main()
```

```
{
    Number n;
    n.print(5);
    return 0;
}
```

Output:

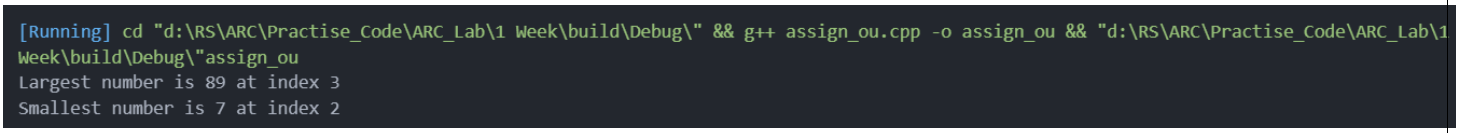


```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1
Week\build\Debug\"assign_ou
Seven
```

/*3 Find the index of the largest number and smallest number in an array*/

```
#include<iostream>
#include<vector>
using namespace std;
int main() {
    vector<int> arr = {12, 34, 7, 89, 45, 22};
    int maxIndex = 0, minIndex = 0;
    int maxNum = arr[0], minNum = arr[0];
    for(int i = 1; i < arr.size(); i++) {
        if(arr[i] > maxNum) {
            maxNum = arr[i];
            maxIndex = i;
        }
        if(arr[i] < minNum) {
            minNum = arr[i];
            minIndex = i;
        }
    }


    cout << "Largest number is " << maxNum << " at index " << maxIndex << endl;
    cout << "Smallest number is " << minNum << " at index " << minIndex << endl;
    return 0;
}
```

Output:



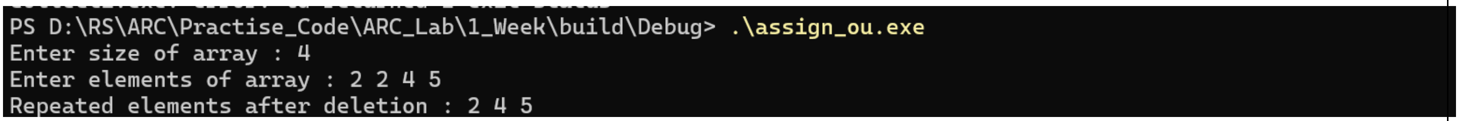
```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1
Week\build\Debug\"assign_ou
Largest number is 89 at index 3
Smallest number is 7 at index 2
```

/*4.Write a program to eliminate duplicates from an array*/

```
#include<iostream>
using namespace std;
int main ()
{
    int A[10], B[10], n, i, j, k = 0;
    cout << "Enter size of array : ";
    cin >> n;
    cout << "Enter elements of array : ";
    for (i = 0; i < n; i++)
        cin >> A[i];
    for (i = 0; i < n; i++)
    {
        for (j = 0; j < k; j++)
        {
            if (A[i] == B[j])
```

```
                break;
        }
        if (j == k)
        {
            B[k] = A[i];
            k++;
        }
    }
    cout << "Repeated elements after deletion : ";
    for (i = 0; i < k; i++)
        cout << B[i] << " ";
    return 0;
}
```

Output:



```
PS D:\RS\ARC\Practise_Code\ARC_Lab\1_Week\build\Debug> .\assign_ou.exe
Enter size of array : 4
Enter elements of array : 2 2 4 5
Repeated elements after deletion : 2 4 5
```

/*5. A library wants to analyse book ratings given by readers.

Requirements:

Store ratings of M books in an array (values between 1 to 5).

Implement the following functionalities:

Calculate the average rating.

Count how many books have a rating of 4 or 5.

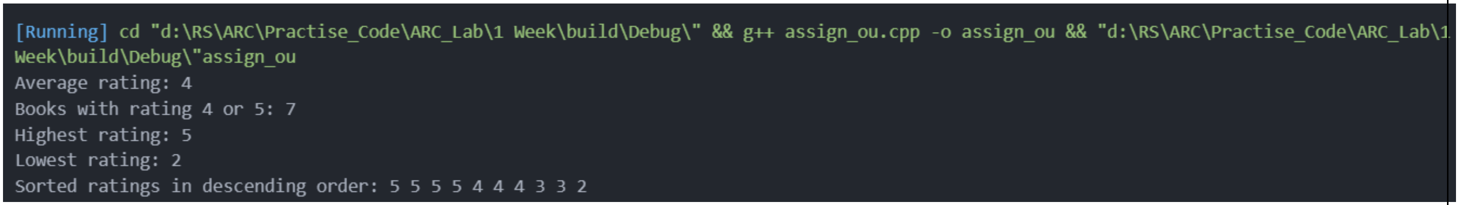
Find the book with the highest and lowest rating.

Sort the ratings in descending order.

***/**

```
#include<iostream>
#include<vector>
#include<algorithm>
using namespace std;
double calculateAverageRating(vector<int> ratings) {
    int sum = 0;
    for(int rating : ratings) {
        sum += rating;
    }
    return (double)sum / ratings.size();
}
int countRatingsAboveFourOrFive(vector<int> ratings) {
    int count = 0;
    for(int rating : ratings) {
        if(rating >= 4) {
            count++;
        }
    }
    return count;
}
int main() {
    vector<int> ratings = {4, 3, 5, 4, 5, 2, 3, 4, 5, 5};
    double averageRating = calculateAverageRating(ratings);
    int booksWithRatingAboveFourOrFive = countRatingsAboveFourOrFive(ratings);
cout << "Average rating: " << averageRating << endl;

cout << "Books with rating 4 or 5: " << booksWithRatingAboveFourOrFive << endl;

int highestRating = *max_element(ratings.begin(), ratings.end());

int lowestRating = *min_element(ratings.begin(), ratings.end());

cout << "Highest rating: " << highestRating << endl;

cout << "Lowest rating: " << lowestRating << endl;

sort(ratings.begin(), ratings.end(), greater<int>());

cout << "Sorted ratings in descending order: ";

for(int rating : ratings) {

    cout << rating << " ";

}

cout << endl;

return 0;

}
```

Output:



```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1 
Week\build\Debug\"assign_ou
Average rating: 4
Books with rating 4 or 5: 7
Highest rating: 5
Lowest rating: 2
Sorted ratings in descending order: 5 5 5 5 4 4 4 3 3 2
```

/*6. Temperature Data Analysis

You are developing a weather tracking system that records daily temperatures.

Requirements:

Store weekly temperature data in an array.

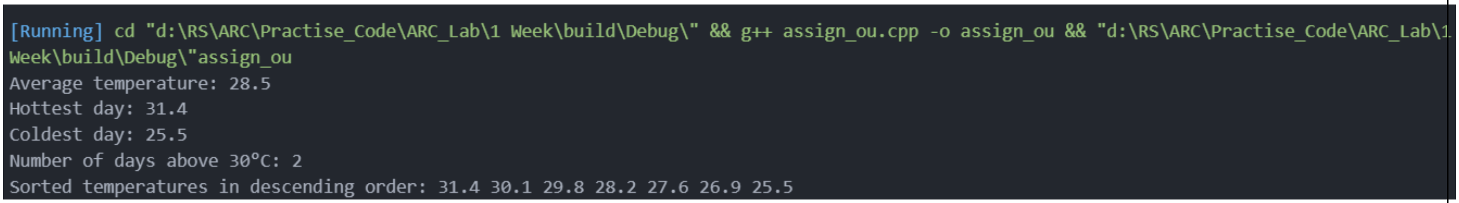
Implement the following functionalities:

Find the average temperature of the week.

Identify the hottest and coldest day.

```
Find the number of days when the temperature was above 30°C.

Sort temperatures in descending order.

*/

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

double calculateAverageTemperature(vector<double> temperatures) {

    double sum = 0;

    for(double temperature : temperatures) {

        sum += temperature;

    }

    return sum / temperatures.size();

}

pair<double, double> findHottestAndColdestDay(vector<double> temperatures) {

    double hottestTemperature = temperatures[0];

    double coldestTemperature = temperatures[0];

    for(double temperature : temperatures) {

        if(temperature > hottestTemperature) {

            hottestTemperature = temperature;

        }

        if(temperature < coldestTemperature) {

            coldestTemperature = temperature;

        }

    }
    return {hottestTemperature, coldestTemperature};
}
int countDaysAboveThirty(vector<double> temperatures) {
    int count = 0;
    for(double temperature : temperatures) {
        if(temperature > 30) {
            count++;
        }
    }
    return count;
    }
int main() {
    vector<double> temperatures = {25.5, 28.2, 29.8, 27.6, 26.9, 30.1, 31.4};
    double averageTemperature = calculateAverageTemperature(temperatures);
    pair<double, double> hottestAndColdestDay =
findHottestAndColdestDay(temperatures);
    cout << "Average temperature: " << averageTemperature << endl;
    cout << "Hottest day: " << hottestAndColdestDay.first << endl;
    cout << "Coldest day: " << hottestAndColdestDay.second << endl;
    cout << "Number of days above 30°C: " << countDaysAboveThirty(temperatures)
<< endl;
    sort(temperatures.begin(), temperatures.end(), greater<double>());
    cout << "Sorted temperatures in descending order: ";
    for(double temperature : temperatures) {
        cout << temperature << " ";
    }
    cout << endl;
    return 0;
    }
```

Output:

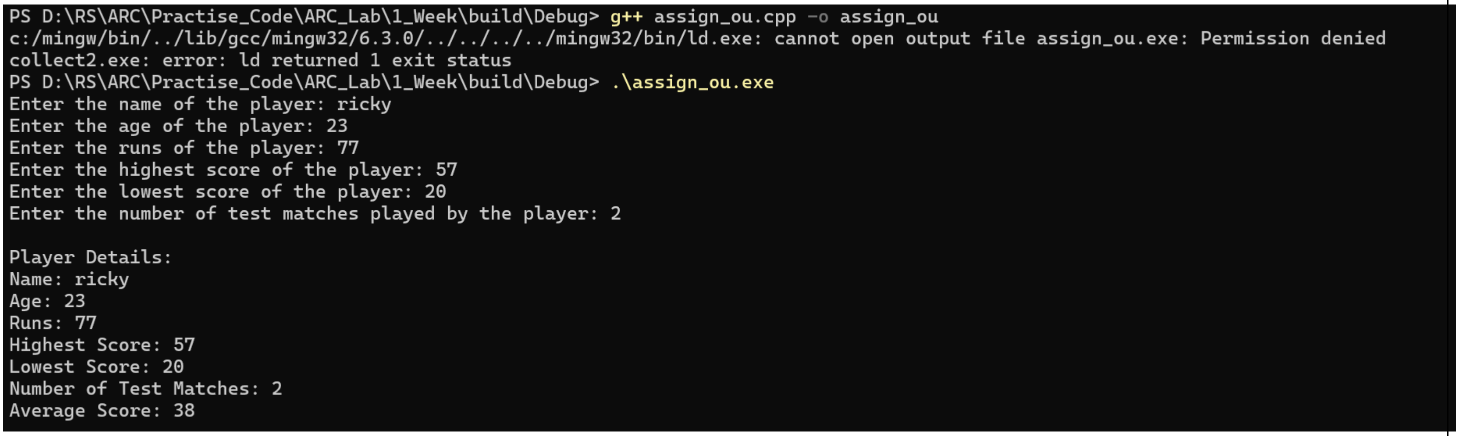


```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1
Week\build\Debug\"assign_ou
Average temperature: 28.5
Hottest day: 31.4
Coldest day: 25.5
Number of days above 30°C: 2
Sorted temperatures in descending order: 31.4 30.1 29.8 28.2 27.6 26.9 25.5
```

/*7. Create a class player with following data members name, age , runs, highest , lowest, test, average. Write member function for each of the following: (i) to get data (ii) to display data (iii) to calculate average of player.*/

```
#include<iostream>
using namespace std;
class player {
    public:
    string name;
    int age;
    int runs;
    int highest;
    int lowest;
    int test;
    double average;
    void getdata(){
        cout<<"Enter the name of the player: ";
        cin>>name;
        cout<<"Enter the age of the player: ";
    cin>>age;
    cout<<"Enter the runs of the player: ";
    cin>>runs;
    cout<<"Enter the highest score of the player: ";
    cin>>highest;
    cout<<"Enter the lowest score of the player: ";
    cin>>lowest;
    cout<<"Enter the number of test matches played by the player: ";
    cin>>test;
    average = runs/test;
    cout<<endl;
    cout<<"Player Details: "<<endl;
    cout<<"Name: "<<name<<endl;
    cout<<"Age: "<<age<<endl;
    cout<<"Runs: "<<runs<<endl;
    cout<<"Highest Score: "<<highest<<endl;
    cout<<"Lowest Score: "<<lowest<<endl;
    cout<<"Number of Test Matches: "<<test<<endl;
    cout<<"Average Score: "<<average<<endl;
    cout<<endl;
    }
};
int main(){
    player p;
    p.getdata();
    return 0;
    }
```

Output:



```
PS D:\RS\ARC\Practise_Code\ARC_Lab\1_Week\build\Debug> g++ assign_ou.cpp -o assign_ou
c:/mingw/bin/../lib/gcc/mingw32/6.3.0/../../../../mingw32/bin/ld.exe: cannot open output file assign_ou.exe: Permission denied
collect2.exe: error: ld returned 1 exit status
PS D:\RS\ARC\Practise_Code\ARC_Lab\1_Week\build\Debug> .\assign_ou.exe
Enter the name of the player: ricky
Enter the age of the player: 23
Enter the runs of the player: 77
Enter the highest score of the player: 57
Enter the lowest score of the player: 20
Enter the number of test matches played by the player: 2

Player Details:
Name: ricky
Age: 23
Runs: 77
Highest Score: 57
Lowest Score: 20
Number of Test Matches: 2
Average Score: 38
```

/*8.   C++ Program for Calculating Labor Wage Based on Hours Worked in a Day using class and object with the following member variables employee name, emp id , no of hours, total wages and member function get data to read the inputs Calculate the wage(), display()

Hours Worked   Rate

the first 8 hours   50

next 4 hours   10/hr

next 4 hours   20/hr

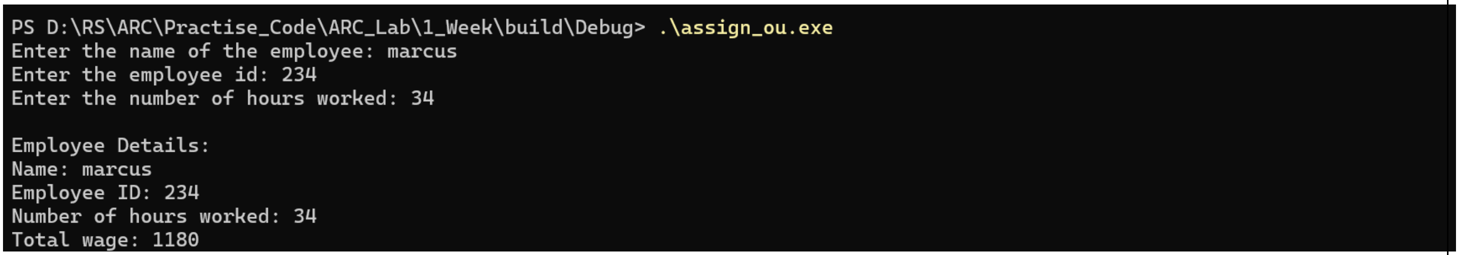
next 4 hours   25/hr

next 4 hours   40/hr

***/**

```
#include<iostream>
using namespace std;
class labor{
  public:
  string name;
  int id;
int hours;
int wage;
void getdata(){
    cout<<"Enter the name of the employee: ";
    cin>>name;
    cout<<"Enter the employee id: ";
    cin>>id;
    cout<<"Enter the number of hours worked: ";
    cin>>hours;
    cout<<endl;
    }
void calculate(){
    if(hours<=8){
        wage = hours*50;
        }
    else if(hours>8 && hours<=12){
        wage = 8*50 + (hours-8)*10;
        }
    else if(hours>12 && hours<=16){
        wage = 8*50 + 4*10 + (hours-12)*20;
        }
    else if(hours>16 && hours<=20){
        wage = 8*50 + 4*10 + 4*20 + (hours-16)*25;
        }
    else{
        wage = 8*50 + 4*10 + 4*20 + 4*25 + (hours-20)*40;
        }
    }
void display(){
    cout<<"Employee Details: "<<endl;
    cout<<"Name: "<<name<<endl;
    cout<<"Employee ID: "<<id<<endl;
    cout<<"Number of hours worked: "<<hours<<endl;
    cout<<"Total wage: "<<wage<<endl;
    }
};
int main(){
    labor l;
    l.getdata();
    l.calculate();
    l.display();
    return 0;
    }
```

Output:



```
PS D:\RS\ARC\Practise_Code\ARC_Lab\1_Week\build\Debug> .\assign_ou.exe
Enter the name of the employee: marcus
Enter the employee id: 234
Enter the number of hours worked: 34

Employee Details:
Name: marcus
Employee ID: 234
Number of hours worked: 34
Total wage: 1180
```

/*9. Suppose you have a Piggie Bank with an initial amount of $50 and you have to add some more amount to it. Create a class 'AddAmount' with a data member

named 'amount' with an initial value of $50. Now make two constructors of this class as follows:

1 - without any parameter - no amount will be added to the Piggie Bank

2 - having a parameter which is the amount that will be added to the Piggie Bank

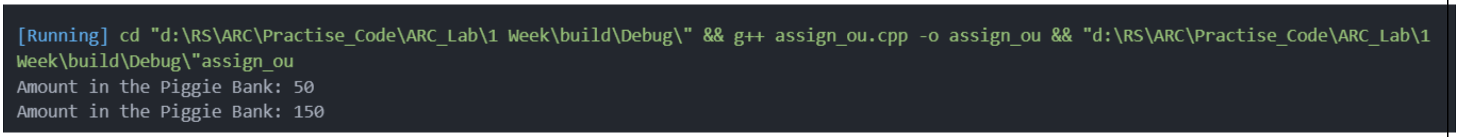
Create an object of the 'AddAmount' class and display the final amount in the Piggie Bank.

***/**

```
#include<iostream>
using namespace std;
class AddAmount{
    public:
    int amount = 50;
    AddAmount(){
        cout<<"Amount in the Piggie Bank: "<<amount<<endl;
        }
    AddAmount(int a){
        amount = amount + a;
        cout<<"Amount in the Piggie Bank: "<<amount<<endl;
        }
    };
    int main(){
        AddAmount a1;
        AddAmount a2(100);
        return 0;
```

```
   }
```

Output:

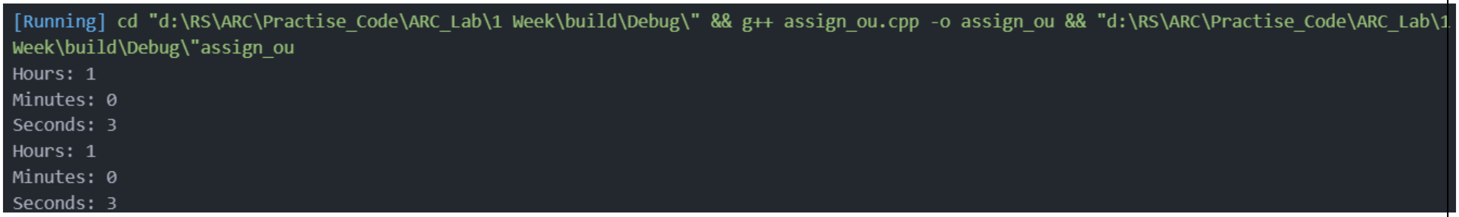


```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\"assign_ou
Amount in the Piggie Bank: 50
Amount in the Piggie Bank: 150
```

/* 10. Create a class Time with the following data members int m, h, s. Write a constructor and copy constructor to initialize the objects and member function for(I) to convert sec in minutes and hours (ii)to display data.*/

```
#include<iostream>

using namespace std;

class Time{

   public:

   int m,h,s;

   Time(int a, int b, int c){

      h = a;

      m = b;

      s = c;

      }

   Time(const Time &t){

      h = t.h;

      m = t.m;

      s = t.s;

      }

   void convert(){
    m = s/60;
    s = s%60;
    h = h + m/60;
    m = m%60;
    }
void display(){
    cout<<"Hours: "<<h<<endl;
    cout<<"Minutes: "<<m<<endl;
    cout<<"Seconds: "<<s<<endl;
    }
};
int main(){
    Time t1(1,2,3);
    Time t2(t1);
    t1.convert();
    t2.convert();
    t1.display();
    t2.display();
    return 0;
}
```

Output:



```
[Running] cd "d:\RS\ARC\Practise_Code\ARC_Lab\1 Week\build\Debug\" && g++ assign_ou.cpp -o assign_ou && "d:\RS\ARC\Practise_Code\ARC_Lab\1
Week\build\Debug\"assign_ou
Hours: 1
Minutes: 0
Seconds: 3
Hours: 1
Minutes: 0
Seconds: 3
```