

C# 3- Practice – Arrays, arrays of objects, lists**Array****1. Exercise**

Write a program, which creates an array of **10 elements of type integer** and initializes each of the elements with a random number between [0-100].

Sum the elements, calculate the average, and find the maximum and minimum values of the elements! Print the array and the calculated results to the console. Sort the elements in ascending order. Don't burn the values into the code.

2. Exercise

Write a program, which reads the scores of a test and according to the given score grade determines the marks of the test. Store the score grade and the name of marks in an array, and use these arrays determining the marks.

Score Grade	Marks
0 – 50	1
51 – 65	2
66 – 75	3
76 – 85	4
86 – 100	5

Array of objects, lists**3. Exercise: Song contest**

There is again a competition, now a song contest in the school. Every student can be participant on this competition and there is a jury to score their production.

The participant has to give his/her name, department, and each of them get a unique number.

During the competition each member of the jury gives a score to the participant, and the sum of these scores will be the total score of this competitor.

Write a program doing these:



- Read the data of participant from a data file (*competitors.txt*). Their number let be the serial number of reading. (It is not unique, but now it is enough – later on we will talk about real unique number)
- Write the data of participant to the console.
- Now the competition is the following: each competitor is scored, namely each member of the jury gives a random score to him/her. (The number of members of jury and the score limit is given at the beginning of the program). After scoring write the data of participant as well.
- Determine the result of the competition:
 1. Who is the winner? (Don't forget about dead heat – that is it is possible that more students got the maximal score.)
 2. What is the result of this competition? Sort the participant in decreasing order by score.

- Find the participant of a given department. This search let be in a loop. Of course, write if there is no result as well.

4. Exercise Winter Olympic Games

Write a program to administer the Winter Olympic Games!

During registration the athletes give their names, numbers, and sport. Of course, they all want to get a medal. For simplicity, we make no difference now between the medals. When the athlete gets medal his/her medals count is incremented by one.

To control the events the program must do the following:

- Read the data of athletes from a text file. The number let be the serial number of reading. The structure of data-file per line: *athletes' _name; sport*.
- Write the data of athletes to the console. (number, name, sport, count of medals).
- Now the competition is the following: ask how many sports are, then generate a winner accidentally for every sports. The winner will receive medal.
- Write the data of athletes to the console again.
- Determine the result of the Olympic games:
 - Who got the most medals?
 - What is the result of this competition? Sort the athletes in decreasing order by count of their medals.
- Find the athletes of a given sport. This search let be in a loop. Of course, write if there is no result of search as well.

Improve, extend your solution:

1. Extend the *Athletes* class :

a/ Give the *nationality* of the athletes.

b/ Make a difference between the medals. Introduce a method to calculate points according to the count of medals. For example: gold medal is 3 points, silver medal is 2 points and bronze medal is 1 point. Modify the sorting: Sort the athletes in decreasing order by points.

5. Exercise – Improve the vehicle fleet problem of practice 2

Create a program to solve the following problems: The owner of vehicles knows that only 10 vehicles can be accommodated in the parking lot. The data of the vehicles are in a text file (*vehicles.txt*). The structure of the text file per line: *license plate number, year of manufacture, average fuel consumption per 100 km*.

After the registration of all vehicles, let operate them! The operation means the next tasks:

While there is more transport job (ask the user), enter the current petrol price (our assumption is that every vehicle refuel in the same time and in the same place), then ask for each vehicle whether it ready to go for the next transport. If the vehicle starts the next transport ask the distance to be covered and run the vehicle. Having “asked” every vehicle write to the console the current transport cost. If there is no more transport write the total operation cost also.

6. Exercise – Modify the animal competition problem

Create a control class for the solution.

- a) Read the data from a text file.
- b) First register the animals, then the competition can be start.
- c) Who is the winner? (Be careful! It can be a dead heat.)
- d) Sort the result
 - In decreasing order by points
 - In increasing order by age.