

# SoftUni Judge System Guidelines

This document describes how assignments are sent and verified through the fully automated “SoftUni Judge” system. The system is online at <https://judge.softuni.bg>. The username and the password are the ones used for logging into <https://softuni.bg>.

## Fully automated testing system

Submitting exercises is fully automated and online. It is done through “SoftUni Judge”: <https://judge.softuni.bg>.

- The assignments are checked online with the “SoftUni Judge” tool through a series of tests. Each successfully passed test brings points to the overall score for the assignment. A test is passed successfully when its result is correct and the testing time is within certain limits.
- **The tests** used by “SoftUni Judge” for verifying assignments are not revealed during competition mode.
- Each participant uses his/her **username** and **password** for <https://softuni.bg> to enter the judge tool.
- Submitting assignments and their verification happens **in real time**. Once an assignment is submitted, the judge tool responds in seconds with the following verification result:
  - The amount of **points** the participant gets from the submitted solution – between 0 and 100
  - A compile time **error message**
- The participant receives the following **status information** for every **test**:
  - Correct result
  - Wrong result
  - Runtime error
  - Time limit
  - Memory limit
- The judge tool verifies the output from the tests **symbol by symbol**
  - Each comma, unnecessary symbol or a missing whitespace results in **0 points** for the corresponding test.
  - Please **do not include any unwanted information** to your assignments, such as “Please enter N=” when it is required to enter a number as an input. This will bring **0 points**.
  - If the output requires a number to be printed to the console (for example: 25), do not include any descriptive messages, such as “The result is 25”. Print **only what is asked in the assignment**.
- The system supports **public rankings** in real time, accessible to all SoftUni students.
  - The rankings display the points per assignment per student.
- The highest score achieved for every assignment is kept in the rankings. If a participant submits a solution that scores less than the solutions he/she has sent before, the system will not take points away.

## Programming Languages

The judge system supports the following programming languages:

- **C# 7** – CSC version 2.10.0.0, x64 Windows, C# version 7.3
- **Java 11** – OpenJDK 11.0.13, x64 Ubuntu
- **C 99** – GCC 7.5.0, x64 Ubuntu
- **C++ 14** – GCC 7.5.0, x64 Ubuntu
- **JavaScript** – Node.JS version v12.22.9, x64 Ubuntu
- **Python 3.6** – Python version 3.6.9, x64 Ubuntu
- **PHP 7** – PHP version 7.2.24 (CLI), x64 Ubuntu

## An Example Assignment – Min3Numbers

You can test your solution for the Min3Numbers exercise with the judge tool at:

<https://judge.softuni.bg/Contests/Practice/Index/132>.

You are given an **N amount of numbers**:  $a_0, a_1, \dots, a_{N-1}$ . Find the three numbers with the smallest values and print them on the console.

### Input

- The input consists of the following lines:
  - First line: You will receive **N** – the amount of numbers
  - N number of lines: **Each line has one number**

On the first line of the input you will receive **N** – the amount of numbers. On the next N number of lines there will be **one number per line**. The input data will be correct and within the described format. There is no need to verify the input.

### Output

Print out to the console **the three smallest numbers** in increasing order. Print each number on a new line. If the numbers are less than three, print them anyway in increasing order.

### Constraints

- N** is an integer within the range of [1 ... 10 000].
- The numbers **a0, a1, ..., aN-1** are integers in the range of [-100 000 ... 100 000].
- The **time limit** is 100 ms
- The **memory limit** is 16 MB

### Examples

You can find examples of inputs and their corresponding outputs in the tables below:

Input	Output	Input	Output	Input	Output	Input	Output	Input	Output
5	-5	2	111	1	20	6	-6	3	1
50	10	222	222	20		-1	-5	1	2
10	15	111				-2	-4	2	3
30						-3		3	
15						-4			
-5						-5			
						-6			

*Scroll down to see implementations in different languages.*

## C# Solution

This is an example solution with C#. The standard C# console is used for the input and the output.

### Min3Numbers.cs

```
using System;
using System.Linq;

class Min3Numbers
{
    static void Main()
    {
        int n = int.Parse(Console.ReadLine());
        int[] numbers = new int[n];
        for (int i = 0; i < n; i++)
        {
            numbers[i] = int.Parse(Console.ReadLine());
        }

        var smallest3Nums = numbers.OrderBy(i => i).Take(3);

        foreach (var num in smallest3Nums)
        {
            Console.WriteLine(num);
        }
    }
}
```

Constraints in the judge system about the C# language:

- Supported version: C# 7, Microsoft Visual C# Compiler, 64-bit on Windows.
- In case multiple classes are implemented, they must be all placed inside of one file, one after another. There may be only one **Main()** method.
- Libraries outside the .NET Framework 4.7 standard are NOT to be used.
- Only the [Wintellect.PowerCollections](#) library is accepted.

## C++ Solution

This is an example solution with C++. The standard C++ console is used for the input and the output.

### Min3Numbers.cpp

```
#include <vector>
#include <iostream>
#include <algorithm>

using namespace std;

int main() {
    int n;
    cin >> n;
    vector<int> numbers;
    for (int i = 0; i < n; i++) {
        int num;
        cin >> num;
        numbers.push_back(num);
    }

    sort(numbers.begin(), numbers.end());

    int count = 0;
    for (auto it = numbers.begin(); it != numbers.end(); ++it) {
        cout << *it << endl;
        count++;
        if (count >= 3) {
            return 0;
        }
    }

    return 0;
}
```

Constraints in the judge system about the C++ language:

- Supported version: C++ 14, GCC 5.2 on Windows (MinGW-w64).
- Libraries outside the standard C++ STL are NOT to be used.
- The type **long** is 32 bits.

## C Solution

This is an example solution with C. The standard C console is used for the input and the output.

### Min3Numbers.c

```
#include <stdio.h>
#include <stdlib.h>

int int_compare(const void *a, const void *b) {
    return (*(int*)a - *(int*)b);
}

int main() {
    int n;
    scanf("%d", &n);
    int* numbers = (int*)malloc(sizeof(int) * n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &numbers[i]);
    }

    qsort(numbers, n, sizeof(int), int_compare);

    int count = (n < 3) ? n : 3;
    for (int i = 0; i < count; i++) {
        printf("%d\n", numbers[i]);
    }

    return 0;
}
```

Constraints in the judge system about the C language:

- Supported version: C99, GCC 5.2 on Windows (MinGW-w64).
- Libraries outside the standard library are NOT to be used.
- The type **long** is 32 bits.

## Java Solution

This is an example solution with Java. The standard Java console is used for the input and the output.

### Min3Numbers.java

```
import java.util.Arrays;
import java.util.Scanner;

public class Min3Numbers {
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        int[] numbers = new int[n];
        for (int i = 0; i < n; i++) {
            numbers[i] = scan.nextInt();
        }

        Arrays.sort(numbers);

        for (int i = 0; i < Math.min(n, 3); i++) {
            System.out.println(numbers[i]);
        }
    }
}
```

Constraints in the judge system about the Java language:

- Supported version: Java 8, javac 1.8.0 Compiler, 64-bit on Windows
- Libraries outside the standard JDK 8 library are NOT to be used.
- There must be only one public class with a **main(args)** method.
- In case of the implementation of various classes, they must be all placed inside of the source code, one after another. It is required that only one of them is public.

## JavaScript Solution

This is an example solution with JavaScript. The input from the function **solve(arr)** is an array of strings. The output is to be printed on the console.

### Min3Numbers.js

```
function solve(arr) {
    var numbers = arr.splice(1).map(Number);

    numbers.sort(function (a, b) { return a - b; });
    let smallest3Numbers = numbers.slice(0, 3);

    for (let num of smallest3Numbers) {
        console.log(num);
    }
}
```

Constraints in the judge system about the JavaScript language:

- Supported version: JavaScript on Node.JS version 8.10.0, 64-bit on Windows (V8 engine, ECMA-262, 3rd edition)
- Submitted only one function **solve(arr)**, which receives the input as an array of strings.
- If multiple functions are used, they must be all placed inside the main function.
- Printing on the console is to be done with **console.log(...)**.

## Python Solution

This is an example solution with Python. The standard Python console is used for the input and the output.

### Min3Numbers.py

```
n = int(input())
nums = list()
for i in range(0, n) :
    nums.append(int(input()))
nums = sorted(nums)
count = min(len(nums), 3)
for i in range(0, count) :
    print(nums[i])
```

Constraints in the judge system about the Python language:

- Supported version: Python 3.6.0, 64-bit on Windows
- The input is to be read with the standard **input()** or with **sys.stdin**.
- The output is to be printed with the standard **print()** or with **sys.stdout**.

## PHP Solution

This is an example solution with PHP. The standard CLI console is used for the input and the output.

### Min3Numbers.php

```
<?php
    fscanf(STDIN, "%d", $n);
    $numbers = array($n);
    for ($i=0; $i < $n; $i++) {
        fscanf(STDIN, "%d", $numbers[$i]);
    }

    sort($numbers);
    $smallest3Numbers = array_slice($numbers, 0, 3);

    foreach ($smallest3Numbers as $num) {
        fprintf(STDOUT, "%d\n", $num);
    }
?>
```

Constraints in the judge system about the PHP language:

- It is supported: PHP 7 CLI (command line interface), engine PHP version 7.1.11, 64-bit on Windows
- The input is read from the standard input – a file with a name **STDIN**.
- The result is printed with the standard output – a file with a name **STDOUT**.



## Link to the SoftUni Judge system – Min3Numbers

You can test your solution for the Min3Numbers exercise with the judge tool at:

<https://judge.softuni.bg/Contests/Practice/Index/132>.

## Submitting a solution

Once you have logged-in at SoftUni Judge, submitting a solution is done from your user interface:

The screenshot shows the 'Submit a solution' page for the 'Min 3 Numbers' problem. The page includes a header with the URL 'https://judge.softuni.bg/Contests/Practice/Index/132#0' and a 'Results' link. The main content area is titled 'Min 3 Numbers' and contains a list of links for different programming languages: 'Condition of the task', 'Solution of C #', 'C++ Solution', 'Java solution', 'JavaScript Solution', 'Decision of C', 'Solution in PHP', 'Python Solution', and 'Ruby's decision'. Below these links is a large black rectangular area for the code editor. To the right of the code editor is a 'Problem results' table showing the results of previous submissions. Below the code editor is a 'Submit' button and a dropdown menu for selecting the programming language. The dropdown menu is currently open, showing options: 'C# code', 'C++ code', 'JavaScript code (NodeJS)', 'Java code', 'PHP code (CLI)', and 'Python code'. Below the dropdown menu is a 'Points' section with a progress bar and a 'Time and memory used' section with a table. The table has columns for 'Points', 'Time and memory used', and 'Submission date'. The table shows the results of previous submissions, including the current submission which is highlighted with a red box.

Participant	Result
Hofhearted	100 / 100
boryana.ai	100 / 100
moni200001	100 / 100
ObedMarsh	100 / 100

Points	Time and memory used	Submission date
0		

## Results

The results from the submitted solutions appear in the table below the submit form a couple of seconds after sending them:

The screenshot shows the 'Results' page for the 'Min 3 Numbers' problem. The page includes a header with the URL 'https://judge.softuni.bg/Contests/Practice/Index/132#0'. The main content area is titled 'Submissions' and contains a table with columns for 'Points', 'Time and memory used', and 'Submission date'. The table shows the results of previous submissions, including the current submission which is highlighted with a red box. The table also includes a 'Details' button for each submission. Below the table is a 'Compile time error' section with a table showing the results of previous submissions.

Points	Time and memory used	Submission date	Details
100 / 100	Memory: 10.04 MB Time: 0.022 s	15:39:11 27.10.2015	Details
70 / 100	Memory: 9.93 MB Time: 0.151 s	15:37:41 27.10.2015	Details
40 / 100	Memory: 13.47 MB Time: 0.054 s	14:15:25 27.10.2015	Details
20 / 100	Memory: 1.59 MB Time: 0.002 s	12:13:21 27.10.2015	Details
20 / 100	Memory: 1.96 MB Time: 0.024 s	11:50:59 27.10.2015	Details
Compile time error	---	11:49:42 27.10.2015	Details