Algorithms and data structures

Laboratory No. 1 Introductory tasks

Exercise 1 Write a program that after loading a sequence of words in one line from a standard input, will display these words in the reverse order of loading on the screen. Use the array to reverse the order of the words.

For example for input: *ene due rike fake*, program will print: *fake rike due ene*

Exercise 2 Write a program that retrieves data from the user about the shopping list. We assume that the user gives a list of products in one line, separated by a comma sign, e.g.: "*cucumber, bread, sparkling water, cinnamon*". Then the list is presented for the user. User has the ability to mark the purchased item. An example of the appearance of the displayed list:

```
1. cucumber
2. bread
3. sparkling water
4. cinnamon
Enter the item you put in your cart:
```

e.g. after throwing a cucumber into the basket (selecting 1):

```
1. cucumber [bought]
2. bread
3. sparkling water
4. cinnamon
```

Use a string array to complete the task. We assume that in optimistic scenario the user can only enter an integer. If the number is outside the range of the list, the message is displayed: "Invalid number". If other than an integer (e.g. "stop", “ddsd”, itp) is specified, the program displays the status of the list and interrupts operation.

Exercise 3 Write a program that allows you to store temperature readings. The user provides a temperature reading via keyboard, and the program saves it in memory and calculates the average of all saved readings and displays all saved readings. Use the array to store data. If there is not enough space in the array, expand it. The program terminates if the user provides input other than integers.

For example, after user enters the next 5th reading, the program will display:

```
Enter a reading:
10 11 9 10 12
average: 10.4
Readings: 10 11 9 10 12
```

Hint: Check contains and split methods in String class and append method in StringBuilder class. Use Scanner to read data from standard input.

After solving the tasks, think about why an array is not always a good choice for storing data in memory.