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## Lab Session 4 : Input/Output

**Task 1:** Do the exercises in the sections:

- 1.4. Arrays
- 1.5. Input and Output

of the “chapter 1. Elements of Programming” of the Book “Introduction to Programming” on the website of the Princeton as we did before:

<https://introcs.cs.princeton.edu/java/home/>

**Task 2:** Do the following exercises:

**Exercise 1:** Write a Java program to find min and max of an array of doubles:

- Size of the array is entered from the keyboard
- Values of elements of array are entered from the keyboard
- Print out the found min and max to the screen
- Use Scanner wrapper and `nextDouble()` method to get data from keyboard

**Exercise 2:** Write a Java program to sort an array of doubles using **Bubble Sort**:

- Size of the array is entered from the keyboard
- Values of elements of array are entered from the keyboard
- Print out the sorted array to the screen
- Use Scanner wrapper and `nextDouble()` to get data from keyboard

**Pseudocode** of the Bubble Sort algorithm is given as follows:

```
-----  
procedure bubbleSort ( A : list of sortable items )  
    n = length(A)
```



```
for i = 0 to n-2 do
  for j = i + 1 to n-1 do
    if A[j-1] > A[j] then
      swap(A[j-1], A[j])
    end if
  end for
end for
end procedure
```

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**Exercise 3:** Write a Java program to manage the employee information of a company as follows:

- Information of each employee is entered from keyboard, including:
  - Employee ID
  - Employee full name
  - Employee department
  - Basic salary
  - Extra salary
- Number of employees (n) is entered from keyboard
- Information of n employees are saved in a text file named: employees.txt
- Information about total income of each employee is read from the employees.txt file and calculated by the formula:
  - $\text{income} = \text{basic\_salary} + \text{extra\_salary} * 2.5$
- Print out to the screen the following information of n employees:
  - Employee ID
  - Employee full name
  - Employee department
  - Employee income