

# Introduction to Programming

## 13th Weekly Note (E17, Week 49)

### 3rd Project Qualification Assessment

If you did not sign up for the third and last assessment yet AND you did NOT score at least 150 points yet, fill out the following poll as soon as possible:

<https://doodle.com/poll/u9gspwb3qbdksi5b>

### Reading for Week 49

- **Obligatory:** None :-)
- **Supplementary:** Android training “Saving Files”  
<https://developer.android.com/training/data-storage/files.html>

### Lecture: Monday, December 4, 12-14 (U140)

We will recap the lecture by developing a simple board game in Java.

### Labs: see detailed schedule on course home page

- **Obligatory:** Write a method `extractSequence` that takes a 2-dimensional array of integers, a starting position given by 2 indices `x` and `y` and two directional values `dx` and `dy` that indicate the direction of the sequence. Your method should return a new integer array containing the integers at  $(x,y)$ ,  $(x+dx,y+dy)$ ,  $(x+2*dx,y+2*dy)$ , ...  
Write a method `maxRun` that takes an array of integers and an integer `i`. It should return the maximal run of `is`, A call `maxRun(new int[] {1,2,1,2,2,2,1,2,2,1,2},2)` would return 3, as 2 occurs at most 3 times in a row.
- *Supplementary:* Write a class `CopyScream` that reads a text file line by line and copies its contents to another file, but all in upper-case letters.
- Challenge: Implement Score Four ([https://en.wikipedia.org/wiki/Score\\_Four](https://en.wikipedia.org/wiki/Score_Four))

### Exercises: see detailed schedule on course home page

- **Obligatory:** Write a method `maxRuns` that gets an array of integers and returns a `Map<Integer,Integer>` that returns a mapping from all integers occurring in the array to the length of the maximum run as in `maxRun`. This can be achieved by calling `maxRun` repeatedly.  
When your implementation of `maxRuns` work, write an implementation `maxRunsSmart` that achieves the same result by only running through the array once, i.e., without calling `maxRuns` repeatedly.
- *Supplementary:* Write a program that downloads the following web page:  
[https://en.wikipedia.org/wiki/List\\_of\\_minor\\_The\\_Hitchhiker%27s\\_Guide\\_to\\_the\\_Galaxy\\_characters](https://en.wikipedia.org/wiki/List_of_minor_The_Hitchhiker%27s_Guide_to_the_Galaxy_characters)  
Then process the text such that you can write the list of all characters to a file “`minor_characters.txt`” using a `PrintStream`.
- Challenge: Implement one of the three variants of 3D chess  
([https://en.wikipedia.org/wiki/Three-dimensional\\_chess](https://en.wikipedia.org/wiki/Three-dimensional_chess))