# Assignment 1 Peak Finding

**Due: March 8th, 2021 (6 am)** **COMP 110 Object-oriented Programming**

In this assignment, you are going to find peaks of a function. Peak of a function is defined as follows: Given an array of function values, f[0], f[1], … f[n] if f[i] is greater than its left and right neighbors, i.e., f[i-1] and f[i+1], then f[i] is considered as peak at position i with a value of f[i]. Function values will be given to you as an integer array. You should write a method, named findPeaks, which accepts an input integer array containing function values, and should return an output array which contains peak values. Size of the output array should be equal to the number of peaks in the input function. If there are no peaks, your method should return null.

findPeaks method signature should be like this:

```
public static int[] findPeaks(int[] input_array)
```

In Figure 1, a sample function is illustrated with three peak points, denoted by the orange points. The output of your program should be like this:

```
There are 3 peak points.
Peak values (y coordinates) are:
34302
29111
13906
```

If there are no peak points, your program should output:

```
There are no peak points.
```

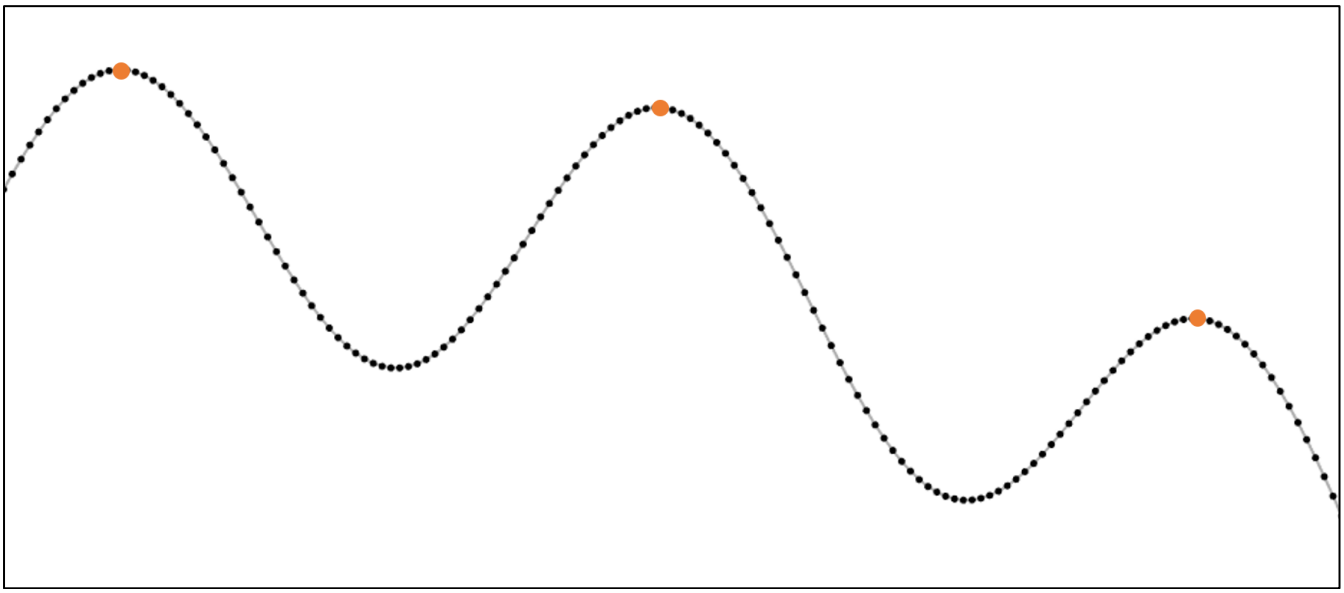

Figure 1. Peaks of the function are shown in orange.

You are given four different functions, as integer arrays, in the template code. In your report, provide the following material for each input array:

1. Console output of your program.
2. Plot of the function as given in Figure 1. To plot function values, you can use Google Sheets, Microsoft Excel or any other program you like to use. You do not need to plot the function in Java.

In your code, write Javadoc style comments and comply with the programming style recommendations discussed in the lectures. Please read the **Evaluation Criteria** and **Submission Guide** sections given below *carefully*.

## Evaluation Criteria and Grading

### Code
20% Compliance to submission rules and programming style, e.g., file names, formats, directory structure, naming conventions, indentation, and comments.
60% Correctness of the solution.

### Report
20% Completeness of the report, compliance to the report format, correctness of the content and language.

## Submission Guide

### Submission Files
Submit a single compressed (.zip) file to Blackboard.
Name your zip file as name_surname.zip.
Zip file should contain all source codes (under the \code directory), and report (in PDF format, under the \report directory).
Name the main code which is used to run your assignment as name_surname.java.
Name your report as name_surname.pdf.
Contents of each Java file should start with your name, student ID, date, and a brief code summary in a Javadoc style comment block.

### Mandatory Submission
Submission of assignments is mandatory. If you do not submit an assignment, you will fail the course.

### Late Submission Policy
Maximum submission delay is two days. Late submission will be graded on a scale of 50% of the original grade. Submission is mandatory even if you submit your assignment late.

### Plagiarism
Plagiarism leads to grade F and YÖK regulations will be applied