

Universitatea Tehnica din Cluj-Napoca  
Departament Calculatoare  
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## Homework 5

### Objective

Lambda Expressions and Stream Processing

### Description

Consider the task of analyzing the behavior of a person recorded by a set of sensors.

The historical log of the person's activity is stored as tuples (*start\_time*, *end\_time*, *activity\_label*), where *start\_time* and *end\_time* represent the date and time when each activity has started and ended while the activity label represents the type of activity performed by the person: Leaving, Toileting, Showering, Sleeping, Breakfast, Lunch, Dinner, Snack, Spare\_Time/TV, Grooming.

The data is spread over several days as many entries in the log *Activities.txt*, taken from [1,2] and downloadable from the file *Activities.txt* located in this folder.

Write a Java 1.8 program using lambda expressions and stream processing to do the tasks defined below.

Task	Grading
Define a class <i>MonitoredData</i> with 3 fields: start time, end time and activity as string.	2 points
Read the data from the file <i>Activity.txt</i> using streams and split each line in 3 parts: <i>start_time</i> , <i>end_time</i> and <i>activity_label</i> and create a list of objects of type <i>MonitoredData</i> .	
Count how many days of monitored data appears in the log.	1 point
Count how many times has appeared each activity over the entire monitoring period. Return a map of type <code>&lt;String, Int&gt;</code> representing the mapping of activities to their count.	2 points
Count how many times has appeared each activity for each day over the monitoring period	1 point
For each line from the file map for the activity label the duration recorded on that line ( <i>end_time</i> - <i>start_time</i> )	1 point
For each activity compute the entire duration over the monitoring period	1 point
Filter the activities that have 90% of the monitoring records with duration less than 5 minutes	1 point
Documentation	1 point

## REFERENCES

[1] Ordóñez, F.J.; de Toledo, P.; Sanchis, A. Activity Recognition Using Hybrid Generative/Discriminative Models on Home Environments Using Binary Sensors. *Sensors* 2013, 13, 5460-5477.

[2] Available online at  
[https://archive.ics.uci.edu/ml/datasets/Activities+of+Daily+Living+\(ADLs\)+Recognition+Using+Binary+Sensors](https://archive.ics.uci.edu/ml/datasets/Activities+of+Daily+Living+(ADLs)+Recognition+Using+Binary+Sensors)