# Introduction to Language Technology 2020 course project

Completion of this course requires you to finish a small-group project on automatic sentiment detection.

For the purposes of the project, please form groups of 2-4 people, preferably involving people with different interests, and register your group at https://tinyurl.com/TKO-8966-groups .

The project is organized into milestone subtasks. **Mandatory** milestones (I-III) must be completed to finish the project, and **bonus** milestones (IV and V) give you additional points toward your grade.

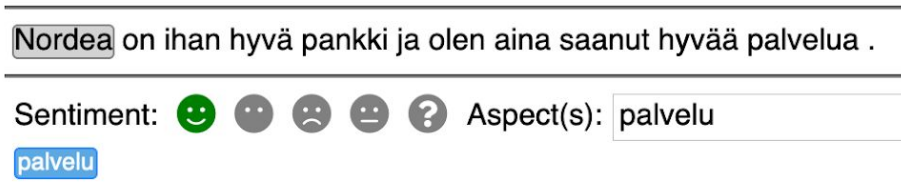
## Milestone I: manual sentiment annotation (mandatory)

The primary data used to develop and evaluate the sentiment detection methods will be collectively annotated by course participants. We have set up an online annotation tool with data for each student at

http://86.50.253.19/TKO_8966-sentiment-[STUDENT-ID]

Where [STUDENT-ID] is your student ID number. For example, if your student ID number is 12345678, use http://86.50.253.19/TKO_8966-sentiment-12345678 .

The data consists of documents where one **target** entity is marked in each text. Your task is to identify the **sentiment** (positive, negative, etc.) that is expressed toward the target and, when applicable, the **aspect** (price, taste, etc.) that the sentiment applies to. Example:




Instructions for annotation are included with the tool.

You can discuss your annotations with others, but **please make your decisions individually**. (The data is partially redundant, and we wish to measure agreement.)

**NOTE**: you can now find a suggested template for your project report at the end of this document.

Milestones II-V have **no individual deadlines** and are all due at the same time with the final project report.

## Milestone II: analysis of sentiment annotations (mandatory)

After manual sentiment annotation is complete, we will merge the annotations of all students and provide every project group with a dataset summarizing the annotations in a simple tab-separated-values (TSV) format.

In milestone II, project groups will analyze this data to identify inconsistencies and challenges in annotation as well as to identify groups of synonymous aspects. The data can be analysed manually, or semi-automatically by calculating and analysing basic data statistics (e.g. label frequencies, aspect frequencies etc.).

## Milestone III: automatic sentiment detection (mandatory)

Each project group will create an automatic sentiment detection system using the annotated data and a text classification method as taught on the course (for example a bag-of-words SVM, but you are free to choose any other classification method as well).

The task setting is as follows: given target texts and their right and left contexts, assign each context to one of the sentiment classes (positive, negative, etc.). For example:

| Left context | Target | Right context | Sentiment |
|---:|:---:|---|---|
| “Minun mielestäni” | “Nordea” | “on ihan hyvä pankki.” | positive |
| “Siirryin” | “Op:sta” | “pois sössimisten vuoksi.” | negative |

The sentiment detection systems will be evaluated on a held-out portion of the annotated data in terms of their accuracy.

We will provide each project group with data for training and evaluating the sentiment detection methods in a simple TSV format.

## Milestone IV: automatic aspect identification (bonus)

Project groups may extend their sentiment detection system to additionally identify the aspects of the target entities that the expressed sentiment applies to.

The task setting is otherwise the same as in Milestone III, but instead of one of the small number of sentiment classes, the system must predict zero or more applicable aspects from the set created in the annotation (e.g. “hinta”, “laatu”, etc.).

This task setting represents a **multilabel** classification problem that can be approached either through the use of classifier variants that directly support such settings (e.g. sklearn MultiOutputClassifier) or by reducing the data to a multitask setting by ignoring the (comparatively rare) cases where more than one aspect applies.

## Milestone V: out-of-domain evaluation (bonus)

The data in milestones I-IV covers a small number of broadly defined topics (cars, music, etc.) that are represented both in the training data and the held-out test data. In Milestone V, project groups have the option to evaluate their methods on texts whose topics are not represented in this data.

Milestone V involves annotation following the approach in Milestone I and evaluation following the process of Milestones III and IV. We will provide project groups targeting Milestone V with data to annotate in the same environment used in Milestone I and the formatted annotations as in milestones III and IV.

**Author1, Author2, …**

# Project report template

This template provides a suggested basic structure for project reports. You are free to choose to follow a different structure for your project reports, but please take care to include required information.

## Contributions

Please include a “contributions” section that clearly identifies who did what in your project. **This information is required**.

## Analysis of sentiment annotations

In this section, present your analysis of the provided sentiment annotations following the instructions above.

## Automatic sentiment detection

In this section, present your automatic sentiment detection system and the results of your evaluation. A possible structure is

### Data

In this subsection, present the statistics of the data that you are using to train and evaluate your system, identifying how the dataset was split into training and held-out test subsets (as well as a development subset, if any).

### Method

In this subsection, present the method applied to perform automatic sentiment detection, including all of its parameters and the process used to select them.

### Results

In this subsection, present the results of your evaluation and relate them to naive baseline results (e.g. random classification and/or always predicting the majority class).

## Automatic aspect identification (optional)

Only include this subsection if you have done the bonus milestone on automatic aspect identification. In this subsection, present your automatic aspect identification system and the results of your evaluation. One possible way to organize this section is to follow the outline above (data, method, results).

## Out-of-domain evaluation (optional)

Only include this subsection if you have done the bonus milestone on out-of-domain evaluation. In this section, present the data prepared for out-of-domain evaluation as well as the results of the evaluation of your method on this data. One possible way to organize this section is to follow the outline above (data, method, results).