1. Python analyst program

This is a Python program that reads a text file containing information about the weekly programming assignments submitted for the Programming Basics course in 2020, analyzes the data, and saves the results to an output file. The submissions include a timestamp, the submitter, and the assignment submitted, and the program determines the number of submissions for each assignment and the following statistics:

(1) Total number of submissions,
(2) Number of unique assignments that received submissions,
(3) Average number of submissions per assignment,
(4) Assignment with the highest number of submissions
(5) Assignment with the lowest number of submissions.
(6) Submission count analysis shows the number of students who submitted a certain number of assignments. Possible submission counts are between 0-60. This way, the results show how the weekly assignment points are distributed among the students.
(7) Hourly analysis shows the number of submissions received during each hour of the day for different lecture weeks.
(8) Time interval analysis is similar to hourly analysis, but instead of each hour of the day, the program calculates the number of submissions received during seven equally long time intervals from the beginning of the submission period. In 2020, the submission period for the weekly assignments was on Tuesday mornings at 06:00. The first time interval is from Tue 06:00 - Wed 06:00, the next from Wed 06:00 - Thu 06:00, and so on.

The user provides the name of the file containing the information, and the program prints the results to the screen and writes them to an output file with a name provided by the user.

The program includes a menu that makes it easy to use. The user can choose from functions such as reading data, analyzing data, saving results, and exiting the program. When reading and writing files, the user is prompted for the file name.

2. Structure of the input file

The structure of the input file is shown below. Each row corresponds to one student's submission for one weekly assignment. The timestamp column contains both the date and time information. The "Student" column contains an anonymized identifier for the student as a string, and the "Task" column contains the identifier for the assignment.

The file is sorted by task identifiers, such that the first task is listed first and the last task is listed last. However, there may be tasks in between that have no submissions, such as L01-T1, L01-T2, L03-T3, etc.

```
Aikaleima(dd-mm-YYYY HH:MM:SS);Opiskelija;Tehtävä
04-09-2020 12:24:12;Opiskelija_001;L01-T1
03-09-2020 10:42:10;Opiskelija_002;L01-T1
03-09-2020 15:05:10;Opiskelija_175;L01-T2
04-09-2020 15:08:00;Opiskelija_176;L01-T2
04-09-2020 13:52:25;Opiskelija_177;L01-T2
16-09-2020 05:21:15;Opiskelija_001;L03-T3
```

3. Structure of the output file and files saved by the analyses

(1-5) The structure of the output file is shown below. At the beginning of the output file, there are summary statistics, and below them, the submission counts for each task are listed with one empty row between each task.

```
Palautuksia tuli yhteensä 15, 4 eri tehtävään.
Viikkotehtäviin tuli keskimäärin 3 palautusta.
Eniten palautuksia, 9, tuli viikkotehtävään L03-T3.
Vähiten palautuksia, 1, tuli viikkotehtävään L14-T3.

Tehtävä;Lukumäärä
L01-T1;2
L01-T2;3
L03-T3;9
L14-T3;1
```

Below are example outputs for the analyses of the file palautukset15.txt.

(6) Below you can see the beginning and end of the file saved by submission count analysis**.**

```
Pistemäärä;Opiskelijoita
0;0
1;13
2;1
...
59;0
60;0
```

(7) Below you can see the beginning of the file saved by the hourly analysis. Note that the header has been abbreviated in the middle.

```
Tunti;0;1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;...;20;21;22;23
Vko 1;0;0;0;0;0;0;0;0;0;1;0;1;1;0;2;0;0;0;0;0;0;0;0
Vko 2;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0;0
Vko 3;0;0;0;0;0;1;0;0;0;0;0;1;0;0;1;1;2;0;0;0;2;1;0;0
```

(8) Below you can see the beginning of the file saved by the Time interval analysis. Note that the header has been abbreviated in the middle.

```
Aikaväli;Tue 06:00;Wed 06:00;Thu 06:00;Fri 06:00;...;Mon 06:00
Vko 1;0;0;2;3;0;0;0
Vko 2;0;0;0;0;0;0;0
Vko 3;4;2;1;0;0;0;2
```

4. Example graphs made with Excel from the results.

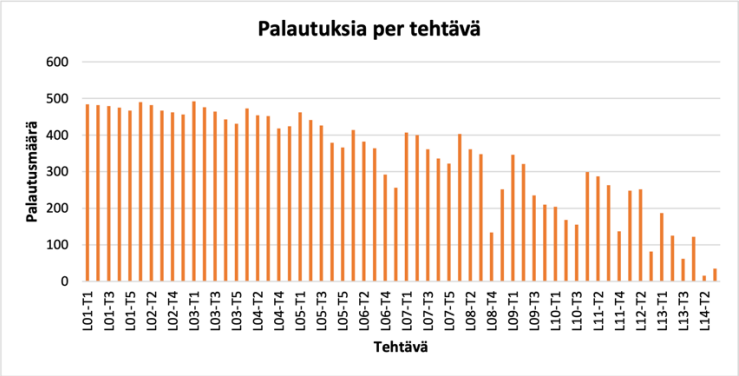

Figure 1. Result of task-specific analysis for the file "palautukset.txt".

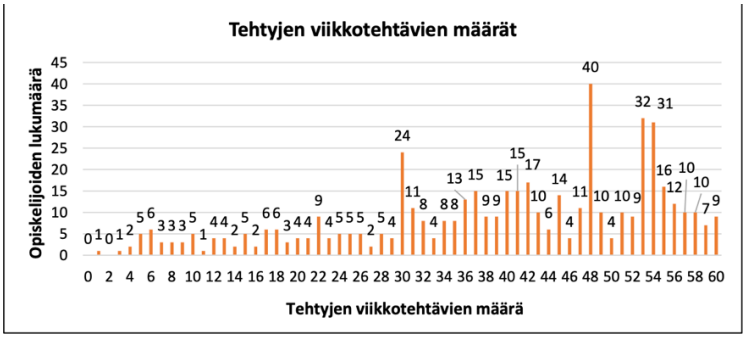

Figure 2. Result of submission count analysis for the file "palautukset.txt".

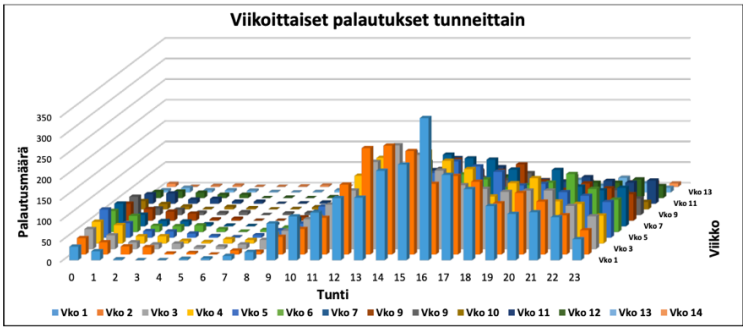

Figure 3. Result of hourly analysis for the file "palautukset.txt".

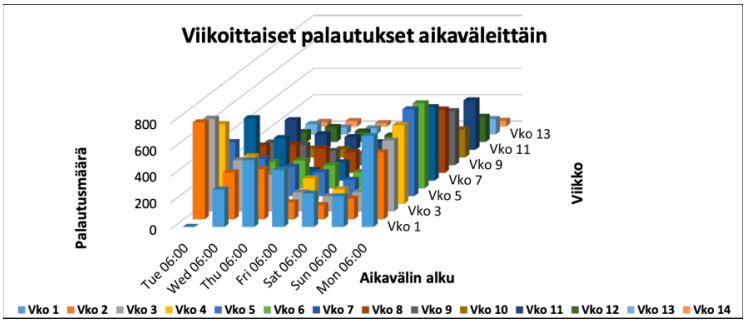

Figure 4. Result of time interval analysis for the file "palautukset.txt".