Classroom Insights Tutorial

Version 1.2

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June 23, 2023

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1 Introduction

Classroom Insights is a software designed to compute various statistical metrics from a CSV file/database of students' and teachers' performance records. It was intended to be the teacher's companion when drafting end-of-sequence or end-of-year reports on classroom performances after evaluations. This software features multiple tools to provide the teacher with a unique perspective on their students' performances across evaluations. This software makes use of quantitative and graphical methods to provide insights. As a bonus, Classroom Insights is designed to allow for archiving statistics per sequence into a database file that can be shared with other colleagues for a more comprehensive perspective on performance. Furthermore, this software leverages the power of machine learning to predict students' performances on exams.

Classroom Insights is open source and the source code is currently hosted on GitHub: GitHub[1] and on SourceForge: sourceforge.net[2]

This document details the simple steps required to successfully install and run the application with an in-depth explanation of its core functionalities. It is organized as follows: Section 2 describes how to properly install and run the software on Windows operating systems and from the Python script. Section 2, details how to use the different features of the software using a template file as an example. Section three provides links to useful resources, documentation, and future tutorials on the software.

2 Installation

Classroom-Insights may be run either from a compiled Windows executable (.exe) or from the Python script from which the former was compiled. The procedures are quite different as outlined below:

2.1 Desktop Installation (Windows .exe)

Visit sourceforge.net[3] to download the latest desktop version of the *ClassroomInsights_setup.exe*. Launch the downloaded file and follow the installation instructions till the end. Once installation is complete, locate the ClassroomInsights icon on the desktop and launch.

[1] https://github.com/Forwah2023/Classsroom-Insights
[2] https://sourceforge.net/projects/classsroom-insights/files/
[3] https://sourceforge.net/projects/classsroom-insights/files/

2.2 Source code installation (.py)

- Make sure Python is installed on your machine. If not, please visit: Python installation[4] or All Python versions[5]. Note that Classroom Insights was written and tested on Python 3.9 and beyond. Skip this step if Python is already installed.
- To run the source code files for Classroom-Insights visit the link:Source distributions[6] and download the files **Source code(zip)** or **Source code(tar.gz)**. These would be downloaded on your local machine as Classsroom-Insights-1.2.zip and Classsroom-Insights-1.2.tar.gz, respectively.
- Open your command line and change the directory to the location of the files you just downloaded. Run the command:

  ```
  pip install Classsroom-Insights-1.2.zip
  ```

  or

  ```
  pip install Classsroom-Insights-1.2.tar.gz
  ```

  , depending on which file you downloaded.
- Alternatively, Unpack these file (.zip or .tar.gz) into a suitable location and run the following shell command from within that location:

  ```
  python setup.py install
  ```

- With the previous step completed, you can start the application from the command line with the following command

  ```
  python __main__.py
  ```

3 Running Classroom-Insights

3.1 Creating a CSV file

Before Running the application, it is preferable to have ready a CSV file of records of students' performances. A CSV file is a database file that can be created from a spreadsheet application such as *Microsoft Excel*. Please refer to Creating a CSV File[7] for further details. Instructions on how to format

[4] https://docs.python.org/3/using/index.html
[5] https://www.python.org/downloads/
[6] https://github.com/Forwah2023/Classsroom-Insights/releases
[7] https://www.wikihow.com/

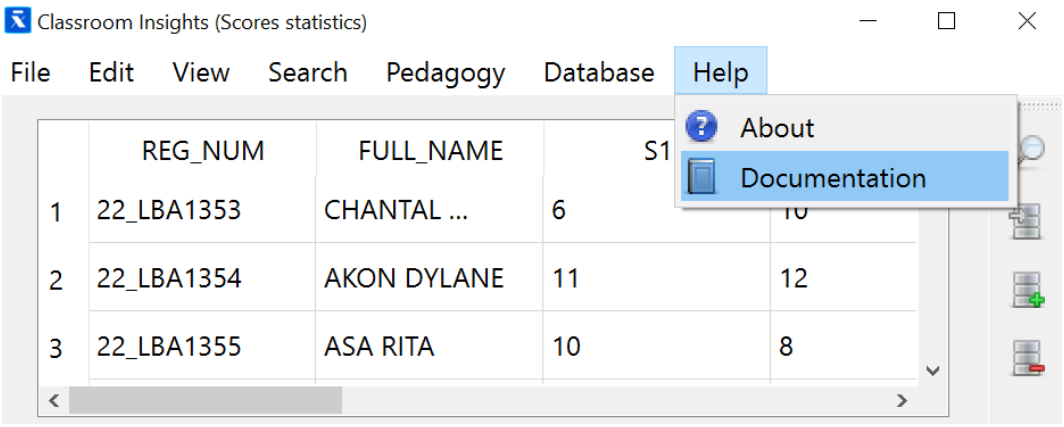

Figure 1: How to access documentation

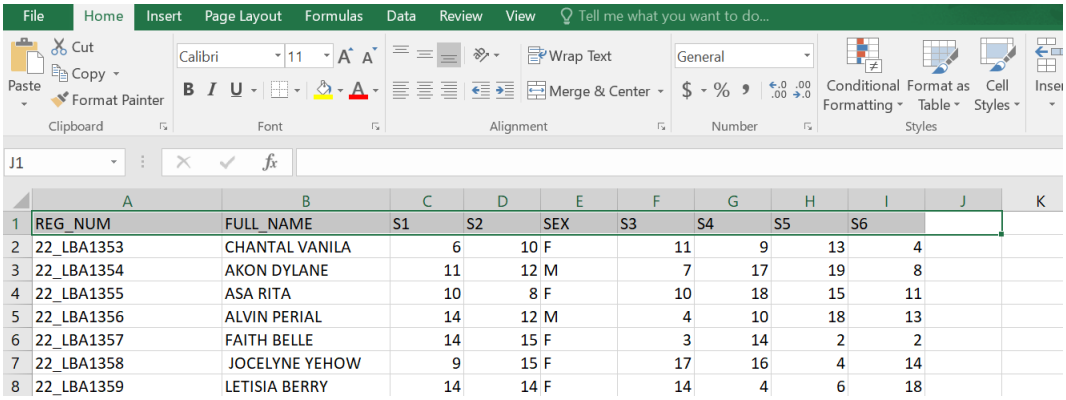

Figure 2: How to format the CSV file.

the header of this CSV file is located in the ***Help»documentation*** section of the app menu, see Figure 1. An example CSV file is packaged with the app, located in the folder Install ***Install directory/docs/Example_Class1.csv***, check it out to see how to properly format the CSV file (see Figure 2).

3.2 Open, edit, and save CSV files

- From the main user interface of the app, open a CSV file at the selected location (see Figure 3).
- Below the ***Save As...*** option of the File menu, resides a list of the 3 most recent files opened in Classroom-Insights, see Figure 3.
- Once opened, the CSV file can be edited by double-clicking on an individual cell of the file contents and updating it. Note that you may

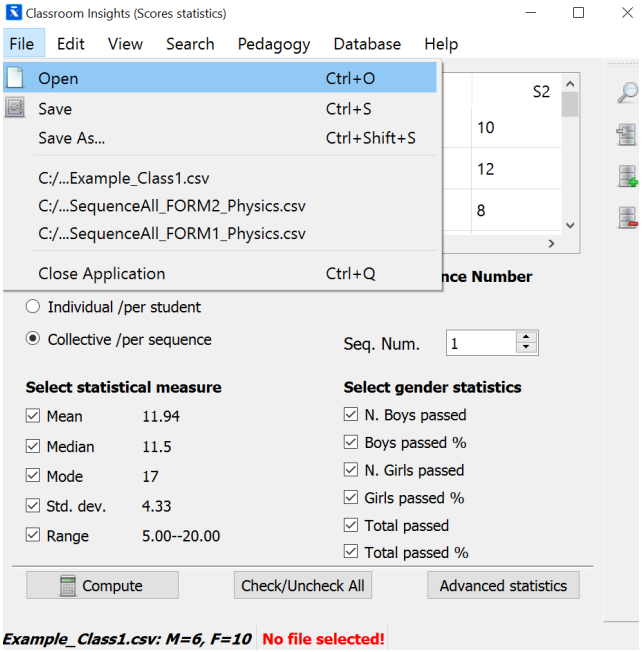

Figure 3: Opening a file from the main user interface (UI)

have to manually save the file for the changes to be reflected in the local file. Records may be: inserted (at any row), appended, deleted, and searched for from the tool buttons (Right Side of the current file contents), see Figure 4.

- To copy, paste, cut, and delete data from the table, access the corresponding actions through the **Edit** menu of the main user interface. This menu also allows you to add or suppress existing rows or records.
- At the bottom of the main UI is information about the gender count of the classroom (**M** for males, and **F** for females).

3.3 Computing the scores statistics for a single student

- To compute the descriptive statistics for a single student over a sequence range **(S1...SN)**, select the **individual or per student** radio button from the ***Select type of statistics*** submenu. Specify the start and the end points of the corresponding sequence range.
- Select the requested type of statistical measure and the corresponding gender statistics.

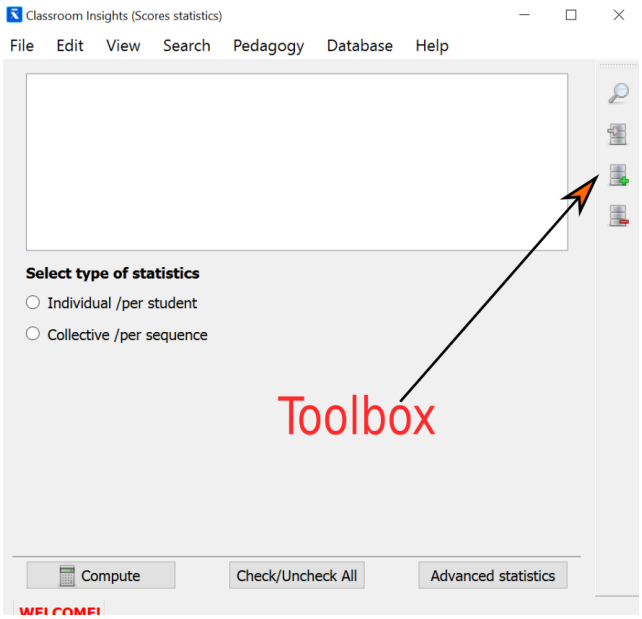

Figure 4: Toolbox in Main UI

- Use the ***Check/Uncheck All*** button to select (deselect) all options.
- Press **compute**
- A pop-up should appear to request for the student's **REG_NUM** or **FULL_NAME** field info (See Figure 5)
- validate the pop-up to visualize the statistical results.

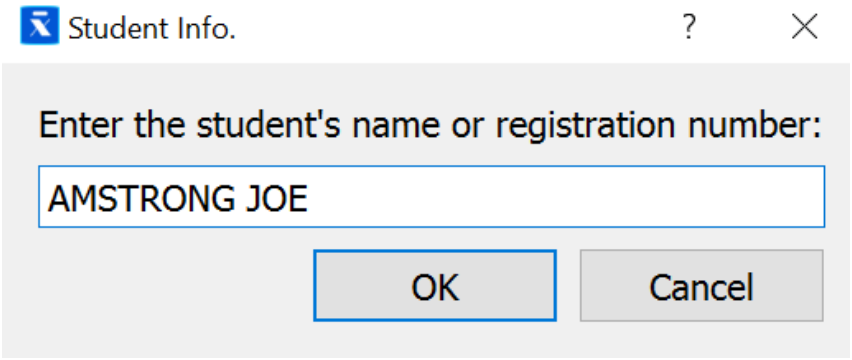

Figure 5: : Pop-up window requesting student's information

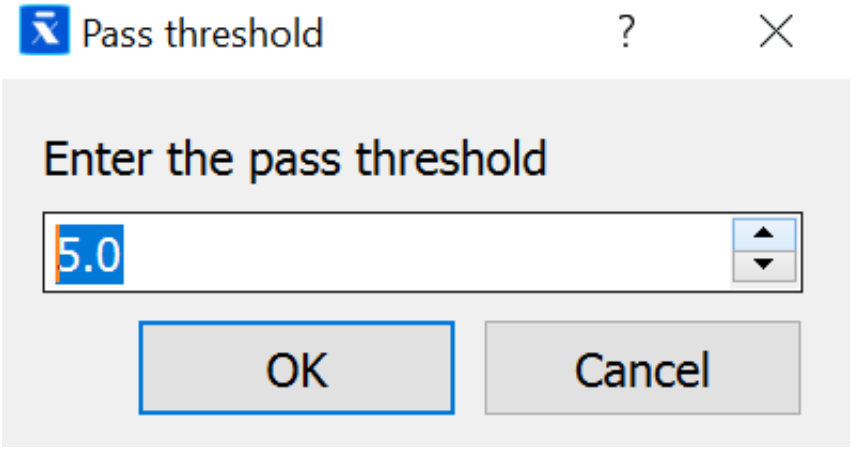

Figure 6: : Pop-up window for specifying the pass threshold

3.4 Computing the scores statistics for All students

- To compute the descriptive and (or) gender statistics for all the students, you need to select the ***Collective/ per sequence*** radio button and specify the corresponding sequence number on the right.
- Select (deselect) the requested descriptive and gender statistics via the checkboxes.
- Press **compute** to visualize the results.
- Note that if the gender statistics were requested when pressing compute, a pop-up window will appear, requesting the user to specify the threshold value for a pass in the specified test. Use the arrows or manually insert the value, see Figure 6.

3.5 Viewing individual scores as bar chart and graph

- Place the pointer on the desired record (row) on the file display window.
- Access the View **menu»View row As...**, and select either Bar chart or graph. See Figure 7.
- This action will plot the scores (for the selected row) in the range **S1-SN** where **N** is the last sequence number detected in the CSV file.
- Alternatively, you may view all the sores for a given sequence by selecting the corresponding column through the action: **View menu»View sequence As»Histogram**

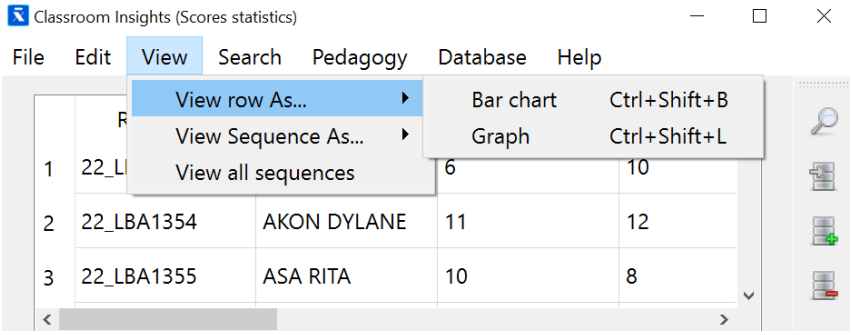

Figure 7: :Viewing scores as graphs or bar charts

- Lastly, to view all sequences as histograms in one plot, selected: **View» View all sequences**.

3.6 Viewing top (worst) performing students

- From the bottom of the main window, search for the **Advanced Statistics** button.
- Before you can access this feature, make sure a file has been opened prior.
- The previous action opens a sub widget, see Figure 8.
- Select the number of records you wish to see by specifying the number in the **Select N** spin box.
- Select one of four options from the radio buttons.
- Select the desired sequence number where applicable.
- The top improving radio button selects students whose performances, across all detected sequences, show a net uptrend.
- The Bottom declining radio button selects students whose performances, across all sequences, show a net downtrend.
- To view the list of **N-students** with the highest (lowest) records on any given sequence, specify the number **Select N** and the radio button **Top (Bottom)** from the advanced window.

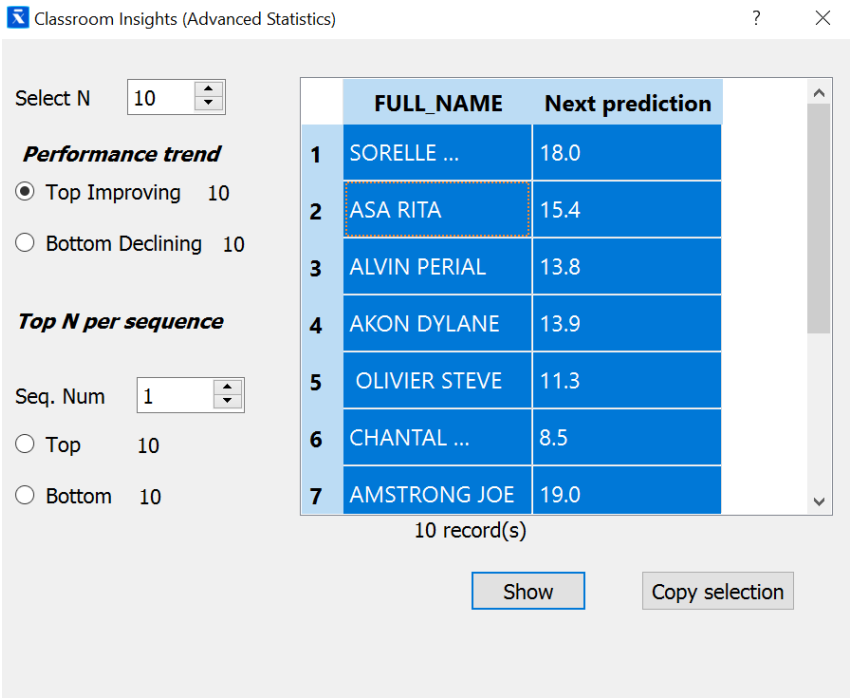

Figure 8: Advanced statistics window

- When all options have been specified, press the **Show** button to view the corresponding list. A list of students and their score predictions for the next sequence should be displayed.
- You may copy the results or predictions using the **copy selection** button (Assuming a selection has been made.)

3.7 Computing lessons and hours statistics

- To access and compute statistics on the teacher's performance (Lessons and hours covered), click on the **Pedagogy»Statistics** menu from the main UI (See Figure 9)
- The pedagogy window should look like Figure 10.
- From this window, specify the number of weeks per year in the current academic year over which you wish to compute the statistics. Do this by either selecting the option: **From calendar** from the spin-box labeled **Number of weeks per year** and clicking the **FROM** and then the **TO** tab of the calendar widget.

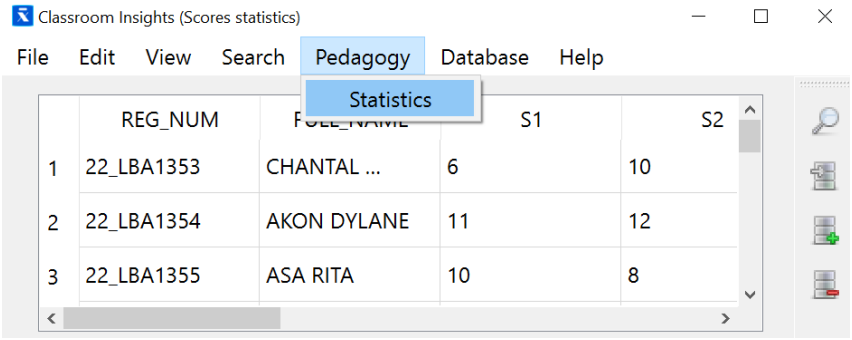

Figure 9: Accessing the pedagogy window

- When your selection is done, click the **choose dates** button.
- This should automatically update the spin-box labeled **weeks** with the number of weeks in selected dates.
- Alternatively, you may manually set this number by editing the corresponding spin box.
- Specify the number of holidays to be subtracted from the number of weeks' variable. By default, this is set to 28 days, corresponding to two weeks of Christmas and two weeks of the Easter holidays.
- Specify the number of hours, weeks due, and taught per sequence, and per year via their corresponding spin-boxes. Also, specify your weekly workload.
- Specify the lessons due and taught per sequence, and per year via their corresponding spin-boxes.
- Press the **compute** button to display the current statistics.
- The hours and lessons due per sequence and per year will be updated accordingly.

3.8 Create and open existing databases via database manager

- Access the database manager from the main UI by clicking **Database » Edit/Manage database** from the main UI. See Figure 11.
- At the top of the displayed window (see Figure 12), in the rectangle, you will find a list of all existing databases stored in your local disk. These

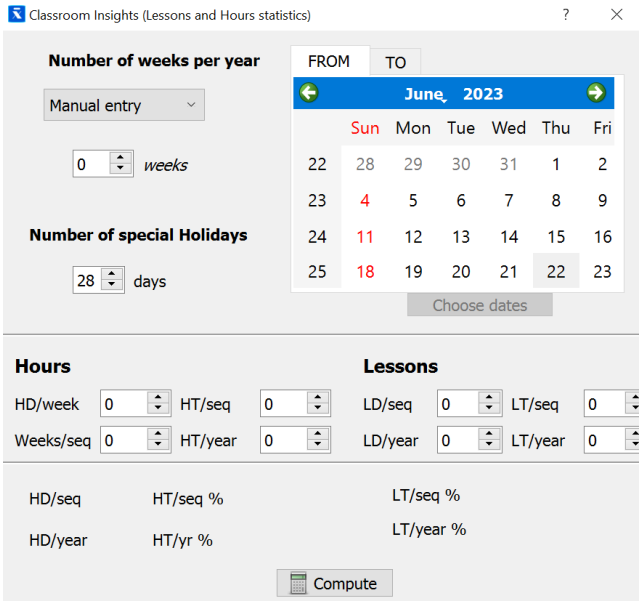

Figure 10: Pedagogy statistics UI

are databases that were previously created by the user. You can access these files by simply searching for them in the Windows (OS) search bar.

- You can select a database from this list by clicking on the desired list item and then pressing **ok** or cancel your selection by pressing the **cancel** button below this list.
- Press **delete** to delete an existing database.
- To open a database that is currently not located in the DBS folder, press the **open database** button below the database list and locate the file for importation.
- If you wish to create a database from scratch, click the **New Database** button. A new section should appear requesting basic information about the database to be created. The **Database Name** and the **Max sequence** are mandatory fields.
- If the user wishes to secure the database to be created with a password, the checkbox **Lock Database** should be ticked, otherwise, leave it unticked.
- Once the create button is clicked, an empty database is created in the DBS folder and the database list is automatically refreshed.

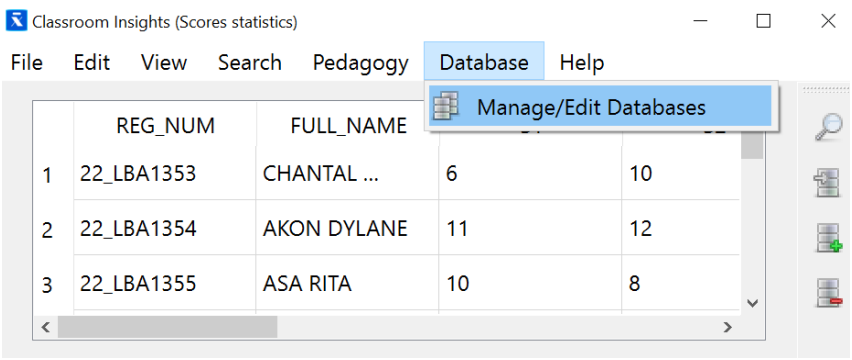

Figure 11: Accessing the database manager

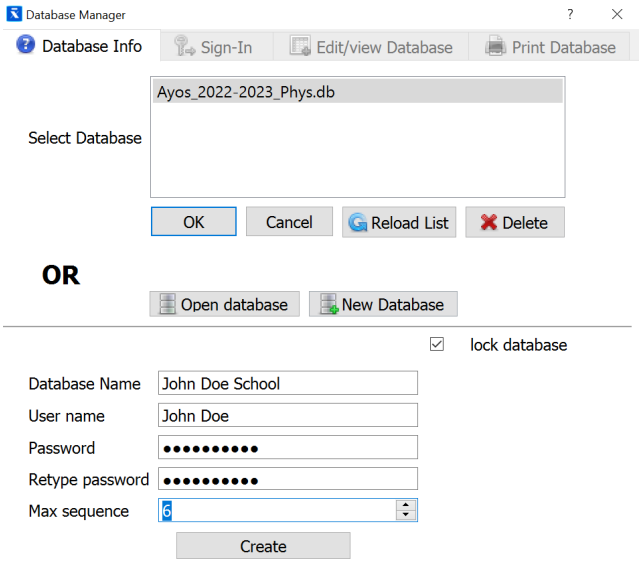

Figure 12: Database manager main UI

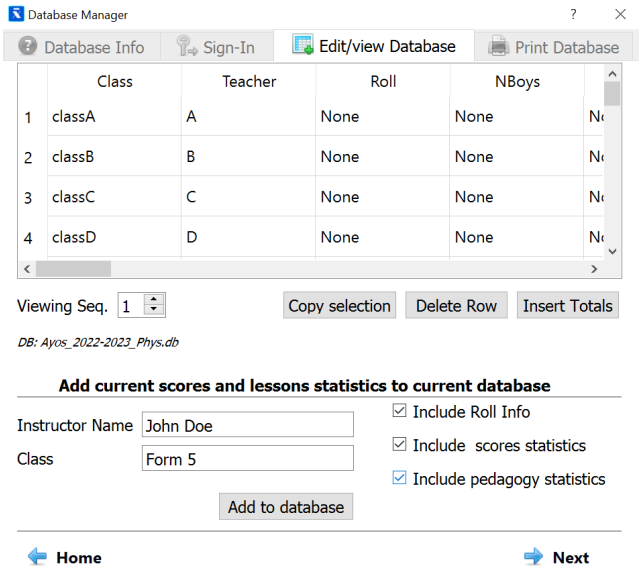

Figure 13: Database editor

3.9 Viewing existing database records

- After selecting a database from the home screen of the database manager, you will be prompted with a sign-In tab if this database was password-locked at creation or directed to an editing tab, see Figure 13.
- At the top of the database editor is a rectangle displaying the records for the current sequence in the database. By default, this sequence is set to 1.
- If you wish to view another sequence, toggle the **Viewing Seq** spin-box below the rectangle, and press show.
- If you wish to delete an existing record from the displayed table, press **Delete Row**.
- The **Insert Totals** inserts a row of sums of the columns in the current database.
- Press the **Copy Selection** button to copy selected rows or columns from the Database columns.

3.10 Inserting computed lessons, hours, and scores statistics into the current database

- From the database manager's editing tab, in the **add current scores and lessons statistics to the current database** section, specify the instructor name and class whose statistics were recently computed in the main UI for scores and pedagogy; these fields are mandatory.
- Make sure the sequence number matches the sequence number in the **Viewing Seq** spin box. If you wish to access another sequence, toggle this spin box.
- To include information about the gender statistics, check the box **Include Roll info**.
- To include information about the descriptive statistics for scores, check the box **Include scores statistics**.
- To include information about the lessons and hours statistics, check the box **Include pedagogical statistics**.
- When your selection is ready, click the **Add to Database** button.
- When all additions and deletions have been completed and you wish to insert the new totals, press the **Insert Totals** once again.

3.11 Printing a selected database

- Select the fields to be printed from the list on the left(see Figure 14). To select all fields, check the box **All**.
- Specify sequences to be included in the pdf file. Specify these as comma-separated values in the field: **Include Sequences**.
- Specify school and author information to be printed in the header of generated pdf.
- Add short summary or comments on the report in the **Comments** field.
- Press the **Generate pdf** button to compile the pdf.
- Press the **Open File Location** to open the folder containing the generated pdf file.

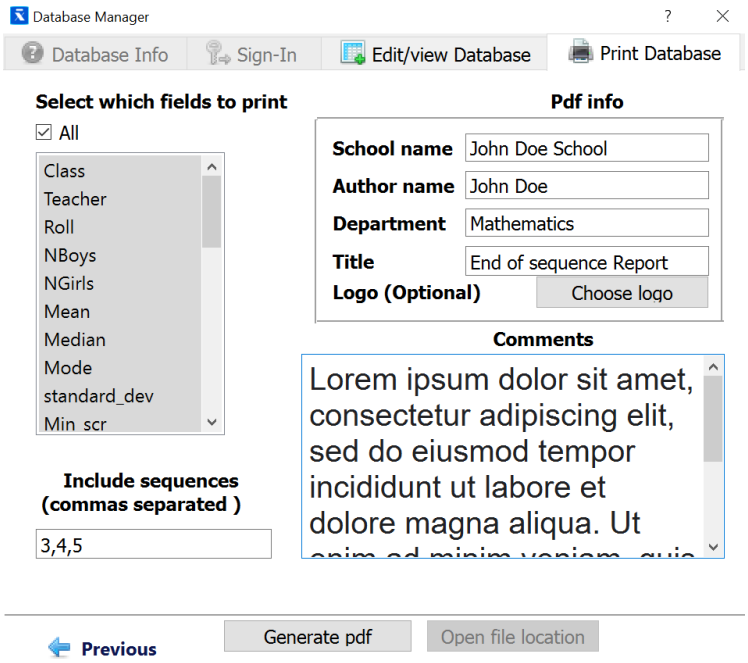

Figure 14: Database pdf generator UI

4 Further resources

Follow new updates on the software and other projects from my company on:

- GitHub[8]
- SourceForge[9]
- YouTube channel[10]

[8] https://github.com/Forwah2023/Classsroom-Insights
[9] https://sourceforge.net/projects/classsroom-insights/
[10] https://www.youtube.com/channel/UCzZv2xHWOPLUl017mM7dOEw