

# Interlude: PA3b

These Practice Exercises are meant to help you review for our next IE.

## Practice Exercise: All this to keep track of grades?

The sample files below are given as examples. You may want to type them out or use some of your own invention to test your solutions. Bottom line, your solutions need to work regardless of the data in the files, and not only work with this one specific sample.

Constraints:

- We are not making any assumptions about the number of grades per student but they are integers.
- No assumptions on the number of students or the length of the last and first names.
- A student ID, on the other hand, will always be made of 3 digits.

## grades.txt

- **Our data files**
- I keep grades for my students in a text file named *grades.txt*. Each line corresponds to a different student and starts with a 3 digits number; the student ID. After this initial data, all the grades for that student appear as integers. Each field is separated from the previous one by one space. Here is a sample *grades.txt*;

357	90	90	100	95	0
666	42	60	30	90	42
956	42	99	100	75	59
975	89	69	60	30	0

## students.txt

```
357 James McPhearson
555 Alan Turing
639 Severus Snape
956 Fox Mulder
975 Thomas Anderson
```

- We keep the first and last names of each student in a separate text file named *students.txt*. Each line is for a separate student. It starts with his/her student ID followed by first and then last names. Each field is separated from the previous one by one space. Here is a sample *students.txt*;
- To make things a bit easier, we will assume that both the *students.txt* and *grades.txt* files' entries are sorted by student ID number.
- Do not leave a “blank line” at the end of either file. When you display them with *cat* on the screen, the last line should be the last line of data, not an empty line.

## Question 1 – Report.1

- At the end of the semester, I want to generate my *report.1* which needs to hold the data illustrated in the following sample;
- I want all students' names to show up, even those for whom I didn't record a single grade

357	James	McPhearson	90	90	100	95	0
555	Alan	Turing					
639	Severus	Snape					
956	Fox	Mulder	42	99	100	75	59
975	Thomas	Anderson	89	69	60	30	0

## Question 2 – Report.2

- At the end of the semester, I want to generate my *report.2* which needs to hold the data illustrated in the following sample;
- I don't want to see in this report the names of students without any grade. Provide the shell line you issued to achieve this goal.

357	James McPhearson	90	90	100	95	0
956	Fox Mulder	42	99	100	75	59
975	Thomas Anderson	89	69	60	30	0

## Question 3 – Report.3

- I'd like to make sure I don't have any lines in *grades.txt* which correspond to a student who doesn't have an entry in *students.txt*.
- To determine this, I usually generate a *report.3* file which holds the lines from *grades.txt* with a student ID not present in any entry of *students.txt*.
- The following would be the data in our *report.3* based on what we have so far in our example data files;

```
666 42 60 30 90 42
```

## Question 4 – Report.4

- I'd like to generate a file named *report.4* holding the list of all students who didn't receive any grades. This means students with an entry in *students.txt* but without one in *grades.txt*.
- Based on our example data files, here's an example of what *report.4* would hold after using your solution;

```
555   Alan      Turing
639   Severus   Snape
```



## Question 5 – Report.5

- Using students IDs is fine for these intermediary reports but, at the end of the semester, I want to generate my *report.5* which needs to look like the following sample;
- Only students with grades are in this report. For each of them, I have their first name, last name, and then all their grades. Provide the shell line you issued to generate this file

James McPhearson	90	90	100	95	0
Fox Mulder	42	99	100	75	59
Thomas Anderson	89	69	60	30	0

## Question 6 – Report.5 Improved

- Assuming I have my *report.5* file, how do I order it alphabetically by first names? When I'm done, I want the same *report.5* file to be ordered as required instead of having to generate yet another text file. Here's an example of applying this solution to the above *report.5* file;

Fox Mulder	42	99	100	75	59
James McPhearson	90	90	100	95	0
Thomas Anderson	89	69	60	30	0

## Question 7 – Report.5 Rounded up

- This is looking better but now I'd like to modify my *report.5* file to replace all occurrences of a 69 by 70, 79 by 80, 89 by 90 and 99 by 100. I still want to do so with a single, even if rather long command. As with question #6, I don't want to generate yet another text file but instead modify directly *report.5*. Here's an example of the result of applying this solution to *report.5*;

Fox Mulder	42	100	100	75	59
James McPhearson	90	90	100	95	0
Thomas Anderson	90	70	60	30	0

## Question 8 – Report.5 top students

- Now, I'd like to be able to extract, from the previous *report.5* file, the first and last names of all the students who have at least a grade of 100 in their list of grades. This list will have to be dumped into another text file named *top.txt*.
- You will have to use both the *grep* and *cut* tools in your solution so read their respective manpages. Here's an example of the resulting *top.txt*;

```
Fox Mulder  
James McPhearson
```

## Question 9 – Report.5 Reverse 1<sup>st</sup> / last name order

- I want to reverse the order of the first and last names in each line of the *report.5* file we've been working with. Then, I'll sort it again by last name this time.
- Note that I don't want to generate more files, just operate on the one I already have from the previous questions.
- You might have to use several tools, and produce a few temporary files (remember to erase them when you are done).
- Here's an example of *report.5* after applying this solution;

```
Anderson Thomas 90    70    60    30    0
McPhearson James    90    90    100    95    0
Mulder Fox          42    100    100    75    59
```

## Question 10 – one last sorting

- Just out of boredom, I'm wondering how I would have been able to sort the *report.5* from question #7 by last name without swapping around the first and last names and by only using the *sort* tool.
- The result would still be to modify *report.5* instead of generating yet another text file. Here's an example of what the result would look like;

Thomas Anderson	90	70	60	30	0
James McPhearson	90	90	100	95	0
Fox Mulder	42	100	100	75	59