Stat Computing - Exercises 02 - Gradebook

There is a dataset in `datasets/grade_book.csv` containing simulated grades for Statistical Computing. From the exercises directory, you can read in the dataset by running

```
dat <- read.csv("../datasets/grade_book.csv")
```

Complete the following exercises related to the grade book.

1. Randomly generate with replacement a birth date for each student between 2001-01-01 and 2005-12-31. Print out how many unique birth dates there are (year-month-date) and how many unique birthdays there are (month-date). Is this surprising?
2. Add the birthdate column to the data frame in 3 different ways: using `cbind`, `$`, and `[[]]`.
3. Print out the column names.
4. Remove the birthdate column and show that it's gone.
5. Print out which column number has the netIDs.
6. Print out the column numbers that contain lab grades. You might find the `grep` function useful.
7. Print out the column numbers that contain exercise grades.
8. What happens when you try to convert the data frame to a matrix with `as.matrix`?
9. Extract the exercise columns and convert to a matrix. Why does this work as intended?
10. Add a column to the data frame containing each student's average exercise grade. Treat missing values as a grade of 0. You can do this in a couple of lines with `rowSums` or `rowMeans`. Exercises are out of 20. Print out the average exercise grades for the first 10 students.
11. Calculate each student's exercise average again, this time using the average of the non-missing values. Print out the average exercise grades for the first 10 students.
12. Print out the number of missing exercises for each exercise.
13. Calculate each student's lab average, and add to the data frame. Labs are out of 10. Print out the average lab grades for the first 10 students.
14. Using the formula in the syllabus, add a column containing each student's overall numeric grade. Treat missing assignments as 0. Project is out of 100.
15. Using the guidelines in the syllabus, add a column containing each student's letter grade.
16. Print out the netID, numeric average, and letter grade for the top 10 scorers. You may want to look at the `order` function.