**Module 4 Pandas Challenge – Written Report**

This analysis was to aggregate two data sets to showcase trends in school performance that could help make decisions for future school budgeting and resource assignment. The first data set includes the information of several district or charter high schools, while the second one consists of the data of students test performance concerning math and reading.

Firstly, an overall view of the school information and students’ test performance were displayed, which included the total school and student counts, total school budget, average scores and the percentage of math and/or reading passing rates. Subsequently, these information were summarized according to each school. Then the highest-performing and the bottom performing schools were identified based on the overall passing rate of a math and reading score of more than 70%. Next, the math and reading scores were organized by grades. Finally, school spending and school size were categorized into multiple levels in order to visualize potential associations between school spending or size and students’ performance. The same analysis was also performed for school type, i.e., charter or district schools.

There are several conclusions we could draw from the above analysis:

1. Unexpectedly, students tend to have better test performance when the school spending per student is lower. The overall passing rate was dramatically higher for spending of less than $585 (around 90%) than $645-680 per student (around 54%).
2. Students’ test performance was significantly better in small (< 1000) or medium (1000-2000) schools than large schools (2000-5000), where the former group had an overall passing rate of about 90% whereas that of the latter group was only around 58%.
3. The top 5 highest-performing schools (by % overall passing of both math and reading) were all charter schools. Whereas the top 5 bottom-performing schools were all district schools. This observation also aligns with the students’ test performance based on the school type, where students in charter schools scored better in math and reading and had higher passing rates than district schools. This shows that students in charter schools generally have better test performance (math and reading) than those in district schools. However, more investigation is required to conclude if this observation is the result of differences in school practices, as it could be confounded with the school size since most charter schools have drastically smaller sizes than district schools.