Report following Pandas challenge - PyCitySchools

1. **Given the provided data, what are the conclusions we can draw about school performance?**

   Of the district-wide standardized test results analyzed for 39,170 total students in 15 schools the following trends were significant.

   There is a large gap in overall passing percentage between top and bottom performing schools with a difference of about 40%. This relates to the data showing that all the top 5 school types are charter in comparison to the bottom are district. One noticeable contributor to this gap is the number of students per school. There are about twice as many students in district school types than there are in charter. However, the budget per student remains relatively close in comparison. Therefore, we need to analyze another contributor to this gap which requires further dissecting the cause for the overall passing which is reflective of both the average math and reading scores. District-wide (both charter and district) there is a 10% difference in favor of reading scores; however, the top charter schools do not have a considerable difference (percent in the 90s). Unfortunately, for the bottom district schools, there is a significant amount of difference between passing math and reading (percent in the 60s vs. 80s respectively).

   Furthermore, when considering the total difference between all school types instead of the top and bottom few, the overall gap remains at about 40% (passing 90% in all charter type vs. 54% in all district). In district, this is also due to low math scores and is more evident by considering the gap between math and reading percentage remaining consistent (passing 67% vs. 81% respectively).

   A good question is why math scores remain poor? Analyzing it by student's grade level (9^{th} – 12^{th}) does not provide a reasonable explanation because it remains consistent throughout. As mentioned above, the budget per student remains close when comparing between school types; however, we can further analyze math scores by school spending to see if there are any noticeable trends. In this analysis, a table is drawn by equally grouping ranges in spending per student. The result does indeed provide one strange explanation, and that is math scores **decline** at a higher rate than reading scores as the spending groups per student increases. This also holds true for the percent in students passing math which enables the overall percentage to drop significantly by more than 30%.

   Following up, this leads one to question why such a noticeable drop with the increase in spending per student? Perhaps, it might have something to do with the size of the school because as mentioned above, there are about twice as many students in district school types than there are in charter. In this analysis, a table is drawn by grouping the size of each school based on the number of students into small, medium, and large. The result confirms that smaller and medium size schools perform better not only overall (about 90%) but also higher in math (above 90%). This provides a better explanation than above because it proves that large size schools do not perform as well especially with respect to student's math scores.

   Therefore, and in recommendation, the spending for large district type schools should be reallocated towards other ways to improve student's math scores and overall passing rate.