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GW Homework 4: Pandas Data Challenge

PyCitySchools:

Three trends I notice:

1. Charter schools in the district have higher test scores than district schools on average math scores and on average reading scores. They also have higher passing math grades and overall passing rates. This is illustrated with the following table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **Overall Passing Rate** |
| **School Type** |  |  |  |  |  |
| **Charter** | 83.473852 | 83.896421 | 100.000000 | 100.0 | 100.000000 |
| **District** | 76.956733 | 80.966636 | 88.991533 | 100.0 | 94.495766 |

In terms of overall passing rates, all of the top five schools are charter schools while all of the bottom five schools are district schools.

1. The smaller the size of the school, the better the test scores. Note on the table below how smaller schools scored better in every metric with the exception of % Passing Reading. Even then, on a table previously made when I though a grade of 70 or below meant failure, smaller schools beat out larger schools in this category.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **Overall Passing Rate** |
| **School Size** |  |  |  |  |  |
| **Small (<1500)** | 83.664898 | 83.892148 | 100.000000 | 100.0 | 100.000000 |
| **Medium (1500-3000)** | 80.904987 | 82.822740 | 95.824730 | 100.0 | 97.912365 |
| **Large (3000-5000)** | 77.063340 | 80.919864 | 89.085722 | 100.0 | 94.542861 |

1. There is a curious trend where the greater the amount spent per student, the worse off the scores and passing rates. The following table illustrates this.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **Overall Passing Rate** |
| **Spending Ranges (Per Student)** |  |  |  |  |  |
| **<600** | 83.455399 | 83.933814 | 100.000000 | 100.0 | 100.000000 |
| **600-625** | 83.599686 | 83.885211 | 100.000000 | 100.0 | 100.000000 |
| **625-650** | 79.079225 | 81.891436 | 92.636050 | 100.0 | 96.318025 |
| **650-675** | 76.997210 | 81.027843 | 89.041475 | 100.0 | 94.520737 |

Out of all of the previous observations, it seems that the most important factor is the type of school. One main difference between charter schools and public schools is that charter schools can be selective about students whereas public schools cannot pick and choose. There may be a selection bias occurring where charter schools try to select the best students. Since they tend to be smaller both in size and in amount spent per student, it seems likely that the observed trends occur due to those variables being strongly correlated with whether a school is a charter school or a public school.