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**Analysis for PyCitySchools Challenge**

**Background:**

This analysis asked me to pretend that I am the new Chief Data Scientist for my city's school district. In this capacity, I’m helping the school board and mayor make strategic decisions regarding future school budgets and priorities.

As a first task, I've been asked to analyze the district-wide standardized test results. I was given access to every student's math and reading scores, as well as various information on the schools they attend. My task was to aggregate the data to showcase obvious trends in school performance.

**Summary of the Data:**

District Summary:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Total Schools** | **Total Students** | **Total Budget** | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** |
| 15 | 39,170 | $24,649,428.00 | 78.985371 | 81.87784 | 74.980853 | 85.805463 | 65.172326 |

School Summary:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **School Type** | **Total Students** | **Total School Budget** | **Per Student Budget** | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** | **Spending Ranges (Per Student)** | **School Size** |
| **Bailey High School** | District | 4976 | $3,124,928.00 | $628.00 | 77.048432 | 81.033963 | 66.680064 | 81.933280 | 54.642283 | $585-630 | Large (2000-5000) |
| **Cabrera High School** | Charter | 1858 | $1,081,356.00 | $582.00 | 83.061895 | 83.975780 | 94.133477 | 97.039828 | 91.334769 | <$585 | Medium (1000-2000) |
| **Figueroa High School** | District | 2949 | $1,884,411.00 | $639.00 | 76.711767 | 81.158020 | 65.988471 | 80.739234 | 53.204476 | $630-645 | Large (2000-5000) |
| **Ford High School** | District | 2739 | $1,763,916.00 | $644.00 | 77.102592 | 80.746258 | 68.309602 | 79.299014 | 54.289887 | $630-645 | Large (2000-5000) |
| **Griffin High School** | Charter | 1468 | $917,500.00 | $625.00 | 83.351499 | 83.816757 | 93.392371 | 97.138965 | 90.599455 | $585-630 | Medium (1000-2000) |
| **Hernandez High School** | District | 4635 | $3,022,020.00 | $652.00 | 77.289752 | 80.934412 | 66.752967 | 80.862999 | 53.527508 | $645-680 | Large (2000-5000) |
| **Holden High School** | Charter | 427 | $248,087.00 | $581.00 | 83.803279 | 83.814988 | 92.505855 | 96.252927 | 89.227166 | <$585 | Small (<1000) |
| **Huang High School** | District | 2917 | $1,910,635.00 | $655.00 | 76.629414 | 81.182722 | 65.683922 | 81.316421 | 53.513884 | $645-680 | Large (2000-5000) |
| **Johnson High School** | District | 4761 | $3,094,650.00 | $650.00 | 77.072464 | 80.966394 | 66.057551 | 81.222432 | 53.539172 | $645-680 | Large (2000-5000) |
| **Pena High School** | Charter | 962 | $585,858.00 | $609.00 | 83.839917 | 84.044699 | 94.594595 | 95.945946 | 90.540541 | $585-630 | Small (<1000) |
| **Rodriguez High School** | District | 3999 | $2,547,363.00 | $637.00 | 76.842711 | 80.744686 | 66.366592 | 80.220055 | 52.988247 | $630-645 | Large (2000-5000) |
| **Shelton High School** | Charter | 1761 | $1,056,600.00 | $600.00 | 83.359455 | 83.725724 | 93.867121 | 95.854628 | 89.892107 | $585-630 | Medium (1000-2000) |
| **Thomas High School** | Charter | 1635 | $1,043,130.00 | $638.00 | 83.418349 | 83.848930 | 93.272171 | 97.308869 | 90.948012 | $630-645 | Medium (1000-2000) |
| **Wilson High School** | Charter | 2283 | $1,319,574.00 | $578.00 | 83.274201 | 83.989488 | 93.867718 | 96.539641 | 90.582567 | <$585 | Large (2000-5000) |
| **Wright High School** | Charter | 1800 | $1,049,400.00 | $583.00 | 83.682222 | 83.955000 | 93.333333 | 96.611111 | 90.333333 | <$585 | Medium (1000-2000) |

**Initial Observations** *(provided in the Starter Code)***:**

* As a whole, schools with higher budgets, did not yield better test results. By contrast, schools with higher spending $645-675 per student actually underperformed compared to schools with smaller budgets ($585 per student).
* As a whole, smaller and medium sized schools dramatically out-performed large sized schools on passing math performances (89-91% passing vs 67%).
* As a whole, charter schools out-performed the public district schools across all metrics. However, more analysis will be required to glean if the effect is due to school practices or the fact that charter schools tend to serve smaller student populations per school.

**Additional Observations** *(my observations)***:**

* When looking at the Math and Reading scores by grade, all 11th grade students have the exact same average math and reading scores. This indicates there may be an issue with the data, which would need to be investigated more.
* However, if there isn’t an issue with the data and it is in fact accurate that all 11th grade students across all the schools in the district did get the same reading and math score, it does show an interesting trend with the progression of performance across a student’s lifespan at the school. Charter students overall perform worse in their Junior year while District students tend to perform their best in their Junior year.