

Challenge 4: PyCitySchools Analysis

In this challenge, I reviewed data from 39,170 students in 15 different schools. The data included grade level, reading and math scores, and school type, size, and budget. I created many different data frames to compare all of this information and draw conclusions about how the variables influence each other. The data frames that support the following conclusions are included in this analysis, along with table 6 which includes a summary of all of the information used to create the cohesive data frames.

The highest performing schools, based on overall passing rates including both reading and math scores, are all charter schools with fewer than 2000 students (tables 1, 2, and 3). I conclude that these schools likely offer smaller class sizes and offer each individual student more attention, so they are set up for greater success in their studies. In contrast, the lowest performing schools are all district schools with greater than 2000 students (tables 2, 3, and 4). Perhaps these schools have large enough class sizes that the students are not as focused on curriculum, or maybe more total students leads the teachers to appoint fewer graded assignments or have less interactive class discussions, which could both lead to less overall learning per student.

Interestingly, the schools with the lowest test scores have the highest budgets per student (table 5). This inverse relationship could imply that those schools are allocating their spending towards areas that are less conducive to academic achievement, like sports or other extracurricular activity resources. More research is needed to determine why the budgets of the lower scoring schools are negatively correlated with student success.

Table 1: Highest Performing Schools (by Overall Passing rates)

	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
school_name									
Cabrera High School	Charter	1858	1081356	582.0	83.061895	83.975780	0.941335	0.970398	0.913348
Thomas High School	Charter	1635	1043130	638.0	83.418349	83.848930	0.932722	0.973089	0.909480
Griffin High School	Charter	1468	917500	625.0	83.351499	83.816757	0.933924	0.971390	0.905995
Wilson High School	Charter	2283	1319574	578.0	83.274201	83.989488	0.938677	0.965396	0.905826
Pena High School	Charter	962	585858	609.0	83.839917	84.044699	0.945946	0.959459	0.905405

Table 2: Scores by School Type

School Type	Average Math Scores	Average Reading Scores	% Passing Math	% Passing Reading	% Overall Passing
Charter	83.473852	83.896421	0.936208	0.965865	0.904322
District	76.956733	80.966636	0.665485	0.807991	0.536722

Table 3: School Size Summary

School Size	Average Math Scores	Average Reading Scores	% Passing Math	% Passing Reading	% Overall Passing
Small (<1000)	83.821598	83.929843	0.935502	0.960994	0.898839
Medium (1000-2000)	83.374684	83.864438	0.935997	0.967907	0.906215
Large (2000-5000)	77.746417	81.344493	0.699634	0.827666	0.582860

Table 4: Lowest Performing Schools (by Overall Passing rates)

school_name	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
Rodriguez High School	District	3999	2547363	637.0	76.842711	80.744686	0.663666	0.802201	0.529882
Figueroa High School	District	2949	1884411	639.0	76.711767	81.158020	0.659885	0.807392	0.532045
Huang High School	District	2917	1910635	655.0	76.629414	81.182722	0.656839	0.813164	0.535139
Hernandez High School	District	4635	3022020	652.0	77.289752	80.934412	0.667530	0.808630	0.535275
Johnson High School	District	4761	3094650	650.0	77.072464	80.966394	0.660576	0.812224	0.535392

Table 5: Spending Summary

	Average Math Scores	Average Reading Scores	% Passing Math	% Passing Reading	% Overall Passing
Spending Ranges (Per Student)					
<\$585	83.455399	83.933814	0.934601	0.966109	0.903695
\$585-630	81.899826	83.155286	0.871335	0.927182	0.814186
\$630-645	78.518855	81.624473	0.734842	0.843918	0.628577
\$645-680	76.997210	81.027843	0.661648	0.811340	0.535269

Table 6: Summary of All Info per School

	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing	School Size
school_name										
Bailey High School	District	4976	\$3,124,928.00	\$628.00	77.05	81.03	66.68%	81.93%	54.64%	Large (2000-5000)
Cabrera High School	Charter	1858	\$1,081,356.00	\$582.00	83.06	83.98	94.13%	97.04%	91.33%	Medium (1000-2000)
Figueroa High School	District	2949	\$1,884,411.00	\$639.00	76.71	81.16	65.99%	80.74%	53.20%	Large (2000-5000)
Ford High School	District	2739	\$1,763,916.00	\$644.00	77.10	80.75	68.31%	79.30%	54.29%	Large (2000-5000)
Griffin High School	Charter	1468	\$917,500.00	\$625.00	83.35	83.82	93.39%	97.14%	90.60%	Medium (1000-2000)
Hernandez High School	District	4635	\$3,022,020.00	\$652.00	77.29	80.93	66.75%	80.86%	53.53%	Large (2000-5000)
Holden High School	Charter	427	\$248,087.00	\$581.00	83.80	83.81	92.51%	96.25%	89.23%	Small (<1000)
Huang High School	District	2917	\$1,910,635.00	\$655.00	76.63	81.18	65.68%	81.32%	53.51%	Large (2000-5000)

Table 6 continued

Johnson High School	District	4761	\$3,094,650.00	\$650.00	77.07	80.97	66.06%	81.22%	53.54%	Large (2000-5000)
Pena High School	Charter	962	\$585,858.00	\$609.00	83.84	84.04	94.59%	95.95%	90.54%	Small (<1000)
Rodriguez High School	District	3999	\$2,547,363.00	\$637.00	76.84	80.74	66.37%	80.22%	52.99%	Large (2000-5000)
Shelton High School	Charter	1761	\$1,056,600.00	\$600.00	83.36	83.73	93.87%	95.85%	89.89%	Medium (1000-2000)
Thomas High School	Charter	1635	\$1,043,130.00	\$638.00	83.42	83.85	93.27%	97.31%	90.95%	Medium (1000-2000)
Wilson High School	Charter	2283	\$1,319,574.00	\$578.00	83.27	83.99	93.87%	96.54%	90.58%	Large (2000-5000)
Wright High School	Charter	1800	\$1,049,400.00	\$583.00	83.68	83.95	93.33%	96.61%	90.33%	Medium (1000-2000)