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Module 4 Pandas Challenge

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<div align="center">PyCitySchools Analysis</div>

The following data analysis using Pandas and Jupyter Notebooks is based on the provided CSV files containing school and student information.

Based on the findings in the subsequent summaries below, Charter schools have less students with lower budgets and lowest spending per student than District schools while still outperforming District schools in all areas. Therefore, the main conclusion is that more money doesn't equate to higher academic success.

District Summary:

- There are fifteen schools with a total of 39,170 students.

- The total budget for all fifteen schools is $24,649,428.00.

- The average math and reading scores are 78.985% and 81.878% respectively with only 74.981% passing math and 85.805% passing reading.

- Overall, 65.172% of students are passing both math and reading.

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	78.985%	81.878%	74.981%	85.805%	65.172%

School Summary:

- Charter schools have students ranging from 427 to 2,283 students; District schools have 2,739 to 4,976 students. This indicates Charter schools have fewer students overall.

- Budgeting is quite diverse. The highest Charter school budget of $1.3 million is well below the lowest District school budget of $1.76 million.

- The budget per student isn't equally divided amongst schools.

- In contrast to District schools, Charter schools have higher math and reading scores individually and collectively as well as a higher percentage of students receiving a 70% or higher.

school_name	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
Bailey High School	District	4976	$3,124,928.00	$628.00	77.05%	81.03%	66.680%	81.933%	54.642%
Cabrera High School	Charter	1858	$1,081,356.00	$582.00	83.06%	83.98%	94.133%	97.040%	91.335%
Figueroa High School	District	2949	$1,884,411.00	$639.00	76.71%	81.16%	65.988%	80.739%	53.204%
Ford High School	District	2739	$1,763,916.00	$644.00	77.10%	80.75%	68.310%	79.299%	54.290%
Griffin High School	Charter	1468	$917,500.00	$625.00	83.35%	83.82%	93.392%	97.139%	90.599%
Hernandez High School	District	4635	$3,022,020.00	$652.00	77.29%	80.93%	66.753%	80.863%	53.528%
Holden High School	Charter	427	$248,087.00	$581.00	83.80%	83.81%	92.506%	96.253%	89.227%
Huang High School	District	2917	$1,910,635.00	$655.00	76.63%	81.18%	65.684%	81.316%	53.514%
Johnson High School	District	4761	$3,094,650.00	$650.00	77.07%	80.97%	66.058%	81.222%	53.539%
Pena High School	Charter	962	$585,858.00	$609.00	83.84%	84.04%	94.595%	95.946%	90.541%
Rodriguez High School	District	3999	$2,547,363.00	$637.00	76.84%	80.74%	66.367%	80.220%	52.988%
Shelton High School	Charter	1761	$1,056,600.00	$600.00	83.36%	83.73%	93.867%	95.855%	89.892%
Thomas High School	Charter	1635	$1,043,130.00	$638.00	83.42%	83.85%	93.272%	97.309%	90.948%
Wilson High School	Charter	2283	$1,319,574.00	$578.00	83.27%	83.99%	93.868%	96.540%	90.583%
Wright High School	Charter	1800	$1,049,400.00	$583.00	83.68%	83.95%	93.333%	96.611%	90.333%

Highest and Bottom Performing Schools (by % Overall Passing) Summary:

- All highest performing schools are Charter schools.

- The lowest performing schools are District schools.

- Higher spending per student doesn't suggest higher performance.

school_name	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
Cabrera High School	Charter	1858	$1,081,356.00	$582.00	83.06%	83.98%	94.133%	97.040%	91.335%
Thomas High School	Charter	1635	$1,043,130.00	$638.00	83.42%	83.85%	93.272%	97.309%	90.948%
Griffin High School	Charter	1468	$917,500.00	$625.00	83.35%	83.82%	93.392%	97.139%	90.599%
Wilson High School	Charter	2283	$1,319,574.00	$578.00	83.27%	83.99%	93.868%	96.540%	90.583%
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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	$2,547,363.00	$637.00	76.84%	80.74%	66.367%	80.220%	52.988%
Figueroa High School	District	2949	$1,884,411.00	$639.00	76.71%	81.16%	65.988%	80.739%	53.204%
Huang High School	District	2917	$1,910,635.00	$655.00	76.63%	81.18%	65.684%	81.316%	53.514%
Hernandez High School	District	4635	$3,022,020.00	$652.00	77.29%	80.93%	66.753%	80.863%	53.528%
Johnson High School	District	4761	$3,094,650.00	$650.00	77.07%	80.97%	66.058%	81.222%	53.539%

Math Scores by Grade/Reading Scores by Grade Summary:

- All grades have similar performance levels in both math and reading individually.

- Math grades range from 76 through 85 percent.

- Reading grades range from 80 through 85 percent.

	9th	10th	11th	12th
Bailey High School	77.083676	76.996772	77.515588	76.492218
Cabrera High School	83.094697	83.154506	82.765560	83.277487
Figueroa High School	76.403037	76.539974	76.884344	77.151369
Ford High School	77.361345	77.672316	76.918058	76.179963
Griffin High School	82.044010	84.229064	83.842105	83.356164
Hernandez High School	77.438495	77.337408	77.136029	77.186567
Holden High School	83.787402	83.429825	85.000000	82.855422
Huang High School	77.027251	75.908735	76.446602	77.225641
Johnson High School	77.187857	76.691117	77.491653	76.863248
Pena High School	83.625455	83.372000	84.328125	84.121547
Rodriguez High School	76.859966	76.612500	76.395626	77.690748
Shelton High School	83.420755	82.917411	83.383495	83.778976
Thomas High School	83.590022	83.087886	83.498795	83.497041
Wilson High School	83.085578	83.724422	83.195326	83.035794
Wright High School	83.264706	84.010288	83.836782	83.644986

	9th	10th	11th	12th
Bailey High School	81.303155	80.907183	80.945643	80.912451
Cabrera High School	83.676136	84.253219	83.788382	84.287958
Figueroa High School	81.198598	81.408912	80.640339	81.384863
Ford High School	80.632653	81.262712	80.403642	80.662338
Griffin High School	83.369193	83.706897	84.288089	84.013699
Hernandez High School	80.866860	80.660147	81.396140	80.857143
Holden High School	83.677165	83.324561	83.815534	84.698795
Huang High School	81.290284	81.512386	81.417476	80.305983
Johnson High School	81.260714	80.773431	80.616027	81.227564
Pena High School	83.807273	83.612000	84.335938	84.591160
Rodriguez High School	80.993127	80.629808	80.864811	80.376426
Shelton High School	84.122642	83.441964	84.373786	82.781671
Thomas High School	83.728850	84.254157	83.585542	83.831361
Wilson High School	83.939778	84.021452	83.764608	84.317673
Wright High School	83.833333	83.812757	84.156322	84.073171

Scores by School Spending Summary:

- Schools with the best average math/reading scores spend less per student.

- Schools with the lowest average math/reading scores spend more per student.

- This indicates that more money doesn't equate to better scores.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
Spending Ranges (Per Student)					
<$585	83.455399	83.933814	93.460096	96.610877	90.369459
$585-630	81.899826	83.155286	87.133538	92.718205	81.418596
$630-645	78.518855	81.624473	73.484209	84.391793	62.857656
$645-680	76.997210	81.027843	66.164813	81.133951	53.526855

Scores by School Size Summary:

- Large (2,000-5,000) schools rank lowest in all categories.

- Medium (1,000-2,000) and small (less than 1,000) schools have similar scores in all categories and perform better than large schools.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
School Size					
Small (<1000)	83.821598	83.929843	93.550225	96.099437	89.883853
Medium (1000-2000)	83.374684	83.864438	93.599695	96.790680	90.621535
Large (2000-5000)	77.746417	81.344493	69.963361	82.766634	58.286003

Scores by School Type:

- Charter schools outperform District schools in all areas.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
School Type					
Charter	83.473852	83.896421	93.620830	96.586489	90.432244
District	76.956733	80.966636	66.548453	80.799062	53.672208