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Course: UofT SCS Data Analytics Boot Camp

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Module 4 Challenge Written Report: PyCitySchools

Criteria:

Written Report (15 points)

To receive all points, the written report presents a cohesive written analysis that:

Summarize the analysis (5 points)

Draws two correct conclusions or comparisons from the calculations (10 points)

To summarize this data, it contains information on 15 schools concerning school type, total students, and total budgets. Budget per student, average scores for math and reading, average passing grades for math and reading, and lastly the overall passing rate.

The analysis allowed us to discover both the top five highest (Figure 1) and lowest-performing (Figure 2) schools.

school_name	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing Rate
Bailey High School	District	1	\$3,124,928.00	\$3,124,928.00	77.048432	81.033963	331800.0	407700.0	271900.0
Johnson High School	District	1	\$3,094,650.00	\$3,094,650.00	77.072464	80.966394	314500.0	386700.0	254900.0
Hernandez High School	District	1	\$3,022,020.00	\$3,022,020.00	77.289752	80.934412	309400.0	374800.0	248100.0
Rodriguez High School	District	1	\$2,547,363.00	\$2,547,363.00	76.842711	80.744686	265400.0	320800.0	211900.0
Wilson High School	Charter	1	\$1,319,574.00	\$1,319,574.00	83.274201	83.989488	214300.0	220400.0	206800.0

Figure 1. (Highest performing schools)

	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing Rate
school_name									
Holden High School	Charter	1	\$248,087.00	\$248,087.00	83.803279	83.814988	39500.0	41100.0	38100.0
Pena High School	Charter	1	\$585,858.00	\$585,858.00	83.839917	84.044699	91000.0	92300.0	87100.0
Griffin High School	Charter	1	\$917,500.00	\$917,500.00	83.351499	83.816757	137100.0	142600.0	133000.0
Ford High School	District	1	\$1,763,916.00	\$1,763,916.00	77.102592	80.746258	187100.0	217200.0	148700.0
Thomas High School	Charter	1	\$1,043,130.00	\$1,043,130.00	83.418349	83.848930	152500.0	159100.0	148700.0

Figure 2. (Lowest performing schools)

Similarly, we discovered grades for math and reading, even respective to the grades they were averaged from in Figures 3 and 4.

[34]:	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

Figure 3. (Average math grades)

[35]:

	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

Figure 4. (Average reading grades)

The included images show the math and reading marks by grade respectively through nine to twelve.

We also calculated the spending and budgets of each school in the database. Figure 5 highlights the total school and student budgets.

nts	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading
1	\$3,124,928.00	\$3,124,928.00	77.048432	81.033963	331800.0	407700.0
1	\$1,081,356.00	\$1,081,356.00	83.061895	83.975780	174900.0	180300.0
1	\$1,884,411.00	\$1,884,411.00	76.711767	81.158020	194600.0	238100.0
1	\$1,763,916.00	\$1,763,916.00	77.102592	80.746258	187100.0	217200.0
1	\$917,500.00	\$917,500.00	83.351499	83.816757	137100.0	142600.0
1	\$3,022,020.00	\$3,022,020.00	77.289752	80.934412	309400.0	374800.0
1	\$248,087.00	\$248,087.00	83.803279	83.814988	39500.0	41100.0
1	\$1,910,635.00	\$1,910,635.00	76.629414	81.182722	191600.0	237200.0
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1	\$585,858.00	\$585,858.00	83.839917	84.044699	91000.0	92300.0
1	\$2,547,363.00	\$2,547,363.00	76.842711	80.744686	265400.0	320800.0
1	\$1,056,600.00	\$1,056,600.00	83.359455	83.725724	165300.0	168800.0
1	\$1,043,130.00	\$1,043,130.00	83.418349	83.848930	152500.0	159100.0
1	\$1,319,574.00	\$1,319,574.00	83.274201	83.989488	214300.0	220400.0
1	\$1,049,400.00	\$1,049,400.00	83.682222	83.955000	168000.0	173900.0

Figure 5. (Total school and student budgets)

It was also possible to see grades regarding school types between Charter and District.

Figure 6 highlights the results between the two sections of our analysis.

[38]:	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing Rate
School Type					
Charter	83.473852	83.896421	142825.000000	147312.500000	138037.500000
District	76.956733	80.966636	256342.857143	311785.714286	206928.571429

Figure 6. (Grades by school type)

Overall, there is a district summary that covers the following requirements:

Requirements

District Summary (20 points)

Calculate the total number of unique schools (2 points)

Calculate the total number of students (2 points)

Calculate the total budget (2 points)

Calculate the average (mean) math score (2 points)

Calculate the average (mean) reading score (2 points)

Use the code provided to calculate the percentage of students who passed math (2 points)

Calculate the percentage of students who passed reading (2 points)

Use the code provided to calculate the percentage of students that passed both math and reading (2 points)

Create a new data frame for the above calculations called district_summary (4 points)

School Summary (20 points)

It can be seen in Figure 7 with the appropriate values.

[30]:	Total Schools	Total Students	Total Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing Rate	% Overall Passing
0	15	39170	24649428	78.985371	81.87784	74.980853	85.805463	80.393158	65.172326

Figure 7. (District Summary)

The school summary can be found in Figure 8:

[31]:	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing Rate
school_name									
Bailey High School	District	1	\$3,124,928.00	\$3,124,928.00	77.048432	81.033963	331800.0	407700.0	271900.0
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Johnson High School	District	1	\$3,094,650.00	\$3,094,650.00	77.072464	80.966394	314500.0	386700.0	254900.0
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Wright High School	Charter	1	\$1,049,400.00	\$1,049,400.00	83.682222	83.955000	168000.0	173900.0	162600.0

Figure 8. (School Summary)

One thing to note is that I have all calculations except the total students, the total students are present in Figure 7 district summary, but not the school summary. It is just a limitation of my submission.

Two conclusions that I can draw from the calculations are that:

- (1) Charter schools outperform District schools in terms of raw grades concerning math and reading, this can be seen in Figure 6.
- (2) The variance of math percent marks from grades in particular schools does not vary more than one percent from 9th to 12th in any given school. This can be seen in Figure 3. The grades stay almost the same for every school between grades 9 to 12.

Work Cited

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