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| **Course:** | Advanced Data Visualization |

# Experiment 10

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| **Aim:** | Design Big Data Dashboards using Tableau on the datasets - Education sector<br><br>Basic - Bar chart, Pie chart, Histogram, Time line chart, Scatter plot, Bubble plot<br><br>Advanced - Word chart, Box and whisker plot, Violin plot, Regression plot (linear and nonlinear), 3D chart, Jitter<br><br>Write observations from each chart |

1. **Dataset**

You can find the dataset here.

**Description**

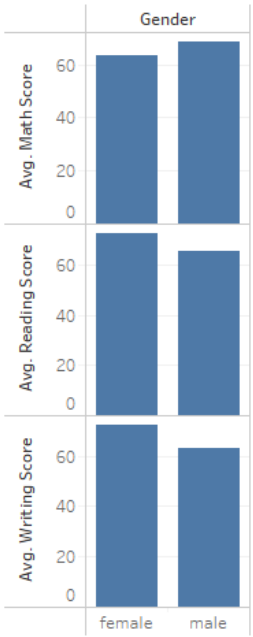
- **gender**: String
- **race/ethnicity**: String
- **parental level of education**: String
- **lunch**: String
- **test preparation course**: String
- **math score**: Number
- **reading score**: Number
- **writing score**: Number

**StudentsPerformance.csv**

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | gender | race/ethni | parental l | lunch | test prepa | math scor | reading sc | writing score | |
| 2 | female | group B | bachelor's | standard | none | 72 | 72 | 74 | |
| 3 | female | group C | some coll | standard | completec | 69 | 90 | 88 | |
| 4 | female | group B | master's c | standard | none | 90 | 95 | 93 | |
| 5 | male | group A | associate | free/reduc | none | 47 | 57 | 44 | |
| 6 | male | group C | some coll | standard | none | 76 | 78 | 75 | |
| 7 | female | group B | associate | standard | none | 71 | 83 | 78 | |
| 8 | female | group B | some coll | standard | completec | 88 | 95 | 92 | |
| 9 | male | group B | some coll | free/reduc | none | 40 | 43 | 39 | |
| 10 | male | group D | high scho | free/reduc | completec | 64 | 64 | 67 | |

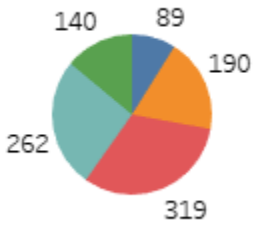
## 2. Charts & Plots

### a) Bar Chart - Average Scores by Gender



- Female students generally perform better in reading and writing
- Male students show slightly higher performance in math
- The gender gap is most pronounced in writing scores

**b) Pie Chart - Distribution of Race/Ethnicity**

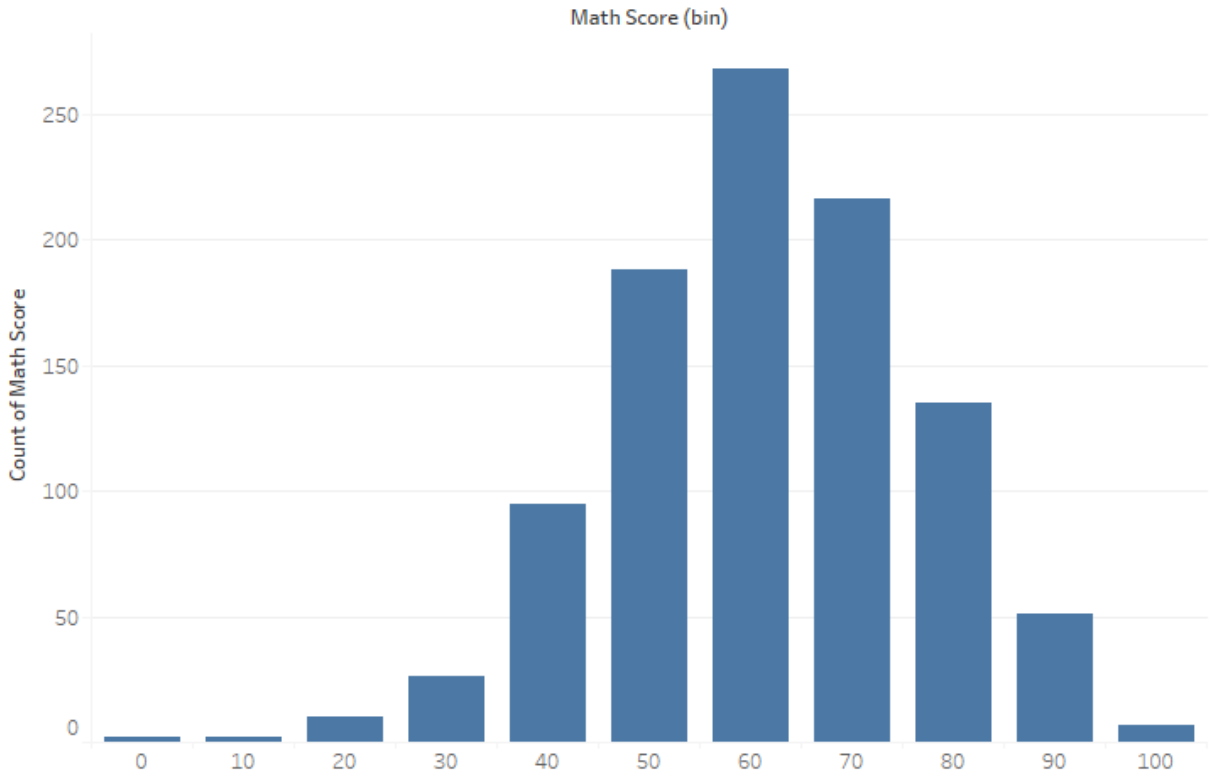



| Abc<br>StudentsPerformance<br>Race/Ethnicity | #<br>StudentsPerformance<br>Count of StudentsPerformance |
|---|---|
| group A | 89 |
| group B | 190 |
| group C | 319 |
| group D | 262 |
| group E | 140 |

**Observation:**

- Group C represents the largest demographic
- Groups A and E have smaller representations
- Distribution is not entirely uniform across groups

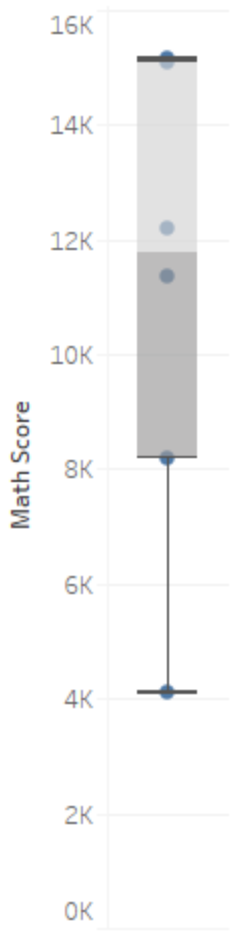
**c) Histogram - Math Score Distribution**




**Observation:**

- Scores follow roughly normal distribution
- Most students score between 60-80
- Few students score below 30 or above 90

**d) Box and Whisker Plot - Score Distribution by Parent Education**




**Conclusion**

**Conclusion:**
The comprehensive analysis of the education sector dataset through various Tableau visualizations reveals significant insights into student performance patterns. The data clearly demonstrates that test preparation courses have a positive impact on student scores across all subjects, with female students generally excelling in reading and writing while male students show slightly better performance in mathematics. Parental education levels exhibit a strong correlation with academic achievement, where students with parents holding higher education degrees tend to perform better. The distribution of scores across different demographic groups and the strong correlation between math and reading scores (as shown in the regression analysis) suggests that targeted interventions, particularly in test preparation and support systems, could help bridge performance gaps. These insights can be valuable for educational institutions in

developing more effective teaching strategies and support programs to enhance student success across all demographics.