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| **NAME:** |  |

**MATH125: Unit 5 Individual Project Answer Form**

**Data Modeling**

ALL questions below must be answered. **Show ALL step-by-step calculations**. Upload this modified Answer Form to the Unit 5 Individual Project. Make sure that you submit your work in a modified MS Word document; handwritten work will not be accepted. If you need assistance, please contact your course instructor.

Graphs and charts allow consumers of information to quickly read, interpret, and analyze data through visual representations. In this assignment, you will interpret, analyze, and create different types of graphs to accurately represent data.

1. Describe the purposes of three different types of data visualizations (graphs and charts). Provide an example of a realistic data set that would be displayed well with each type of graph or chart. (Do not include the graphs or charts).

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| **Purpose of Bar Graphs**  **and Data Example (5 points)** | **?** |

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| **Purpose of Pie Charts**  **and Data Example (5 points)** | **?** |

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| **Purpose of Line Graphs**  **and Data Example**  **(5 points)** | **?** |

1. The members of a family of four (two parents and two children) are trying to be more conscious of their water usage. To find opportunities where they might make the most impact, they researched the average household water consumption for various uses. They already have a new house with efficient appliances, which will decrease water usage for the dishwasher and clothes washer. Help them determine where they can make the most impact with their water usage.

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| **Type of Use** | **U.S. Average Consumption of Water** | **Parent 1 Daily**  **(Gallons)** | **Parent 2 Daily**  **(Gallons)** | **Child 1 Daily**  **(Gallons)** | **Child 2**  **Daily**  **(Gallons)** | **Daily**  **Total**  **(Gallons)** | **Weekly**  **Total**  **(Gallons)** |
| **Bath** | 36 gallons per bath | 0 | 0 | 36 | 36 | 72 | 504 |
| **Shower** | 5 gallons per minute | 15 | 25 | 0 | 0 | 40 | 280 |
| **Teeth Brushing** | 0.5 gallon per minute | 2 | 2 | 1 | 1 | 6 | 42 |
| **Handwashing** | 1 gallon per minute | 4 | 7 | 4 | 5 | 20 | 140 |
| **Dish Washer\*\*** | 6 gallons per load | 0 | 6 | 0 | 0 | 6 | 42 |
| **Clothes Washer\*\*** | 25 gallons per load | 50 | 0 | 0 | 0 | 50 | 350 |
| **Toilet Flush** | 1.6 gallons per flush | 5 | 5 | 5 | 5 | 20 | 140 |
| **Drinking Water** | 8 ounces per glass | 1 | 1 | 0.5 | 0.5 | 3 | 21 |
| **Outdoor Watering** | 2 gallons per minute | 40 | 0 | 0 | 0 | 40 | 280 |
| **Grand Total** |  | 117 | 46 | 46.5 | 47.5 | 257 | 1,799 |

\*\*EnergyStar

* 1. Analyze the family’s water consumption based on the data that you have collected.

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| **What type of chart or graph would you use to compare individual family members’ daily water usage?**  **Why?**  **(5 points)** |  |

Use MS Excel to create the chart or graph that was selected above. Use appropriate labeling.   
(Copy and paste the graph here.) **(5 points)**

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| **Rank the family members in order of their daily water usage.**  **Who can impact the family’s water consumption the most?**  **(5 points)** |  |

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| **What type of chart or graph would you use to compare the different types of water consumption to the total weekly usage for the top two family members?**  **Why?**  **(5 points)** |  |

Use MS Excel to create the chart or graph that was selected above. Use appropriate labeling.   
(Copy and paste the graph here.) **(5 points)**

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| **Based on the graph that you just created above, summarize what you can determine about the types of water usage for the top two family members.**  **(5 points)** |  |

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| **What recommendation can you make to decrease the overall water consumption?**  **(5 points)** |  |

1. Use the table of monthly expenses below for the following questions:

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|  | **January** | **February** | **March** | **April** | **May** | **June** | **6-Month Total** |
| **Rent** | $750 | $750 | $750 | $750 | $750 | $750 | $4,500 |
| **Car** | $299 | $299 | $299 | $299 | $299 | $299 | $1,794 |
| **Water** | $45 | $65 | $68 | $72 | $78 | $80 | $408 |
| **Electricity** | $135 | $70 | $85 | $65 | $80 | $90 | $525 |
| **Groceries** | $205 | $150 | $200 | $210 | $435 | $150 | $1,350 |
| **Gas** | $67 | $75 | $150 | $45 | $65 | $60 | $462 |
| **Insurance** | $189 | $189 | $189 | $189 | $189 | $189 | $1,134 |
| **Total** | $1,690 | $1,598 | $1,741 | $1,630 | $1,896 | $1,618 | $10,173 |

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| **What type of chart or graph would you use to visualize a comparison of each expense in relation to the 6-month total?**  **Why?**  **(5 points)** | **?** |

Use MS Excel to create the chart or graph that was selected above. Use appropriate labeling.   
(Copy and paste the graph here.) **(5 points)**

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| **Summarize what you can determine about the monthly expenses based on the graph that you created.**  **(5 points)** | **?** |

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| **Some of the expenses remain constant, whereas other expenses vary each month.**  **What type of chart or graph would you use if you wanted to visualize the monthly trends for the expenses that change each month?**  **Why?**  **(5 points)** | **?** |

Use MS Excel to create the type of chart or graph that was selected above for one of the expenses that vary: water, electricity, groceries, or gas. Use appropriate labeling.   
(Copy and paste the graph here.) **(5 points)**

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| **Based on the graph that you just created above, which month had an outlier?**  **What is a logical reason why this month’s expenses could have been outside of the normal range?**  **(5 points)** | **?** |

1. Graphs and charts can help others interpret and understand data. However, data are sometimes displayed in ways that can manipulate the meaning or emotions behind the data. Describe one possible way that this could happen. **(10 points)**