1. Identify key trends in the car sales data
   * Which vehicle makes and models are performing best/worst?

Toyota sold the most with a count of 73 and their most popular model was the Prius with 22 sales. Tesla and Honda are tied for the worst with 5 sales each, Tesla Model S had 2 sales and Honda Civic had 2 sales.

Best Sales:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Make** | **Model** | Sale\_Price | Count of Model | Sum of Sale\_Price |
| **Toyota** | **Avalon** | $39,500.00 | 1 | $39,500.00 |
|  | **Avalon Total** |  | **1** | **$39,500.00** |
|  | **Camry** | $28,000.00 | 5 | $140,000.00 |
|  | **Camry Total** |  | **5** | **$140,000.00** |
|  | **C-HR** | $26,500.00 | 1 | $26,500.00 |
|  | **C-HR Total** |  | **1** | **$26,500.00** |
|  | **Corolla** | $22,000.00 | 4 | $88,000.00 |
|  |  | $24,500.00 | 1 | $24,500.00 |
|  | **Corolla Total** |  | **5** | **$112,500.00** |
|  | **FJ Cruiser** | $31,500.00 | 1 | $31,500.00 |
|  | **FJ Cruiser Total** |  | **1** | **$31,500.00** |
|  | **Highlander** | $43,000.00 | 12 | $516,000.00 |
|  |  | $44,800.00 | 3 | $134,400.00 |
|  | **Highlander Total** |  | **15** | **$650,400.00** |
|  | **Mirai** | $58,500.00 | 4 | $234,000.00 |
|  | **Mirai Total** |  | **4** | **$234,000.00** |
|  | **Prius** | $27,000.00 | 19 | $513,000.00 |
|  |  | $29,500.00 | 3 | $88,500.00 |
|  | **Prius Total** |  | **22** | **$601,500.00** |
|  | **RAV4** | $32,000.00 | 10 | $320,000.00 |
|  |  | $35,800.00 | 3 | $107,400.00 |
|  | **RAV4 Total** |  | **13** | **$427,400.00** |
|  | **Sequoia** | $56,900.00 | 1 | $56,900.00 |
|  | **Sequoia Total** |  | **1** | **$56,900.00** |
|  | **Tacoma** | $33,500.00 | 3 | $100,500.00 |
|  | **Tacoma Total** |  | **3** | **$100,500.00** |
|  | **Venza** | $35,800.00 | 1 | $35,800.00 |
|  | **Venza Total** |  | **1** | **$35,800.00** |
|  | **Yaris** | $18,500.00 | 1 | $18,500.00 |
|  | **Yaris Total** |  | **1** | **$18,500.00** |
| **Toyota Total** |  |  | **73** | **$2,475,000.00** |

Worst Sales:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Make** | **Model** | Sale\_Price | Count of Model | Sum of Sale\_Price |
| **Tesla** | **Model S** | $89,500.00 | 2 | $179,000.00 |
|  | **Model S Total** |  | 2 | $179,000.00 |
|  | **Model Y** | $10,435.00 | 2 | $20,870.00 |
|  |  | $10,436.00 | 1 | $10,436.00 |
|  | **Model Y Total** |  | 3 | $31,306.00 |
| **Tesla Total** |  |  | 5 | $210,306.00 |
| **Honda** | **Accord** | $29,800.00 | 3 | $89,400.00 |
|  | **Accord Total** |  | **3** | **$89,400.00** |
|  | **Civic** | $24,500.00 | 2 | $49,000.00 |
|  | **Civic Total** |  | **2** | **$49,000.00** |
| **Honda Total** |  |  | **5** | **$138,400.00** |

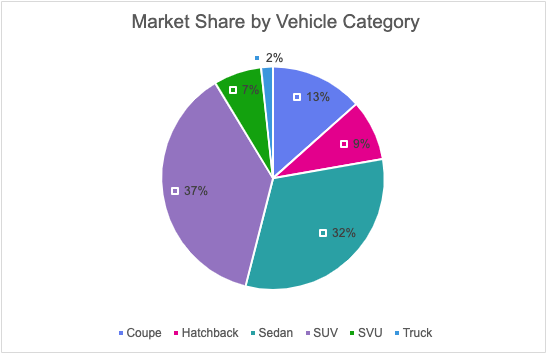
* + Are there seasonal patterns in car buying behavior?

From this data, sales total increased each quarter with Quarter 4 bringing in $300,000 more than the previous quarter.

|  |  |  |
| --- | --- | --- |
| **Q4** | Oct | $480,000.00 |
|  | Nov | $423,200.00 |
|  | Dec | $977,600.00 |
| **Q4 Total** |  | **$1,880,800.00** |

1. Spot patterns across vehicle categories
   * Are certain vehicle types (SUVs, sedans, electric vehicles) growing faster?

SUVs are responsible for 37% of total sales and standard cars brought in the most sales and eco-friendly did the worst.



|  |  |  |
| --- | --- | --- |
| **Market\_Segment** | **Vehicle\_Category** | **Sum of Sale\_Price** |
| **Eco-Friendly** | Hatchback | $513,000.00 |
| **Eco-Friendly Total** |  | **$513,000.00** |
| **Luxury/Performance** | Coupe | $199,800.00 |
|  | Sedan | $638,400.00 |
|  | SUV | $418,306.00 |
|  | SVU | $129,000.00 |
| **Luxury/Performance Total** |  | **$1,385,506.00** |
| **Standard** | Coupe | $579,500.00 |
|  | Sedan | $1,205,400.00 |
|  | SUV | $1,750,900.00 |
|  | SVU | $274,900.00 |
|  | Truck | $100,500.00 |
| **Standard Total** |  | **$3,911,200.00** |
| **Grand Total** |  | **$5,809,706.00** |

* + Is there a shift in consumer preferences for certain fuel types?

There is an extreme difference in fuel type preference. Gasoline fuel type is responsible for 82% of total sales and hybrid cars are 4% of total sales.

* + Do sales of certain vehicle categories correlate with specific seasons or economic indicators?

Although SUV sales are responsible for a majority of profit and Quarter 4 was most successful, most SUVs were sold in Q1. Despite the vehicle category, the cars with the lower sale price segment did better than those at a higher price.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Quarter** | **Vehicle\_Category** | **Sale\_Price\_Segment** | **Count of Vehicle\_Category** | **Sum of Sale\_Price** |
| **Q1** | **Hatchback** | $25K-$39.9K | 1 | $27,000.00 |
|  | **Hatchback Total** |  | **1** | **$27,000.00** |
|  | **Sedan** | $25K-$39.9K | 7 | $190,200.00 |
|  |  | $60K-$89.9K | 2 | $179,000.00 |
|  |  | Under $25,000 | 9 | $208,200.00 |
|  | **Sedan Total** |  | **18** | **$577,400.00** |
|  | **SUV** | $25K-$39.9K | 3 | $116,700.00 |
|  |  | $40K-$59.9K | 6 | $247,200.00 |
|  | **SUV Total** |  | **9** | **$363,900.00** |
| **Q1 Total** |  |  | **28** | **$968,300.00** |
| **Q2** | **Hatchback** | $25K-$39.9K | 10 | $270,000.00 |
|  | **Hatchback Total** |  | **10** | **$270,000.00** |
|  | **Sedan** | $25K-$39.9K | 3 | $88,800.00 |
|  | **Sedan Total** |  | **3** | **$88,800.00** |
|  | **SUV** | $25K-$39.9K | 6 | $199,600.00 |
|  |  | $40K-$59.9K | 7 | $272,035.00 |
|  | **SUV Total** |  | **13** | **$471,635.00** |
|  | **Truck** | $25K-$39.9K | 2 | $67,000.00 |
|  | **Truck Total** |  | **2** | **$67,000.00** |
| **Q2 Total** |  |  | **28** | **$897,435.00** |
| **Q3** | **Coupe** | $90K-$129.9K | 2 | $199,800.00 |
|  | **Coupe Total** |  | **2** | **$199,800.00** |
|  | **Hatchback** | $25K-$39.9K | 2 | $54,000.00 |
|  | **Hatchback Total** |  | **2** | **$54,000.00** |
|  | **Sedan** | $25K-$39.9K | 1 | $39,500.00 |
|  |  | $40K-$59.9K | 1 | $58,500.00 |
|  |  | $60K-$89.9K | 2 | $179,800.00 |
|  |  | Under $25,000 | 3 | $59,400.00 |
|  | **Sedan Total** |  | **7** | **$337,200.00** |
|  | **SUV** | $25K-$39.9K | 7 | $247,000.00 |
|  |  | $40K-$59.9K | 7 | $339,500.00 |
|  |  | Under $25,000 | 5 | $114,500.00 |
|  | **SUV Total** |  | **19** | **$701,000.00** |
|  | **SVU** | $25K-$39.9K | 2 | $70,900.00 |
|  |  | $40K-$59.9K | 3 | $145,400.00 |
|  |  | Under $25,000 | 2 | $45,800.00 |
|  | **SVU Total** |  | **7** | **$262,100.00** |
| **Q3 Total** |  |  | **37** | **$1,554,100.00** |
| **Q4** | **Coupe** | $90K-$129.9K | 5 | $579,500.00 |
|  | **Coupe Total** |  | **5** | **$579,500.00** |
|  | **Hatchback** | $25K-$39.9K | 1 | $27,000.00 |
|  | **Hatchback Total** |  | **1** | **$27,000.00** |
|  | **Sedan** | $25K-$39.9K | 10 | $296,200.00 |
|  |  | $40K-$59.9K | 3 | $175,500.00 |
|  |  | $60K-$89.9K | 4 | $279,600.00 |
|  | **Sedan Total** |  | **17** | **$751,300.00** |
|  | **SUV** | $25K-$39.9K | 13 | $381,200.00 |
|  | **SUV Total** |  | **13** | **$381,200.00** |
|  | **SVU** | $25K-$39.9K | 2 | $55,800.00 |
|  |  | $40K-$59.9K | 2 | $86,000.00 |
|  | **SVU Total** |  | **4** | **$141,800.00** |
| **Q4 Total** |  |  | **40** | **$1,880,800.00** |
| **Grand Total** |  |  | **133** | **$5,300,635.00** |

* + Are premium models performing differently than economy models?

Luxury/Performance total sales are nearly a third of that of the standard models.

|  |  |  |
| --- | --- | --- |
| **Market\_Segment** | **Vehicle\_Category** | **Sum of Sale\_Price** |
| **Eco-Friendly** | Hatchback | $513,000.00 |
| **Eco-Friendly Total** |  | **$513,000.00** |
| **Luxury/Performance** | Coupe | $199,800.00 |
|  | Sedan | $638,400.00 |
|  | SUV | $418,306.00 |
|  | SVU | $129,000.00 |
| **Luxury/Performance Total** |  | **$1,385,506.00** |
| **Standard** | Coupe | $579,500.00 |
|  | Sedan | $1,205,400.00 |
|  | SUV | $1,750,900.00 |
|  | SVU | $274,900.00 |
|  | Truck | $100,500.00 |
| **Standard Total** |  | **$3,911,200.00** |
| **Grand Total** |  | **$5,809,706.00** |

1. Develop actionable automotive business recommendations
   * Keep standard cars in stock with a focus on standard size SUVs that have a gasoline fuel type.
   * Pricing recommendations: The number of cars sold at a slightly lower rate is substantially higher than those sold with a slight price increase.
   * Q4 sales showed to be higher than the others so any Holiday/End of the Year savings or promotions would be beneficial
   * The Midwest is substantially lacking in total car sales and it may be necessary to send a Sales Training Manager and marketing resources to help boost sales.