We can clearly see all three sales categories have positive correlation with each other during the last six months. Food Sales and Home Furniture have strong positive correlation of 0.8644922 or 86.4%. It is surprising to see how two completely different categories have such a high positive pattern. Both segments are unrelated and yet the real numbers prove the opposite. Although it is hard to see in the graph but we can notice both lines are almost identical for two categories. On the other hand, Food and Electronics & Appliance categories have the smallest correlation of 0.1950026 or 19.5%. Perhaps its not surprising that food and electronics have a low correlation. Since two seems to be unrelated in any way. However, it is very surprising that the correlation of Home Furniture and Electronic & Appliance stands at just 0.220205781 or 22%. The common sense would probably suggest when people buy home furniture, they would probably buy some electronics and appliances for their houses. Thus, the both segments should have strong correlation but the numbers showing the opposite.

|  |  |  |  |
| --- | --- | --- | --- |
| **Month 2004** | **Food** | **Home Furniture** | **Electronics & Appliance** |
| Aug | $ 710,773 | $ 11,217 | $ 7,819 |
| Jul | $ 710,409 | $ 11,298 | $ 7,908 |
| Jun | $ 702,350 | $ 11,104 | $ 7,821 |
| May | $ 704,309 | $ 11,034 | $ 7,938 |
| Apr | $ 702,681 | $ 10,941 | $ 7,810 |
|  |  |  |  |
| Source: |  |  |  |
| [Business and Industry: Time Series / Trend Charts (census.gov)](https://www.census.gov/econ/currentdata/?programCode=MARTS&startYear=1992&endYear=2024&categories%5b%5d=44X72&dataType=SM&geoLevel=US&adjusted=1&notAdjusted=1&errorData=0) | | | |
|  |  |  |  |
|  | *Food* | *Home Furniture* | *Electronics & Appliance* |
| Food Sales | 1 |  |  |
| Home Furniture | 0.8644922 | 1 |  |
| Electronics & Appliance | 0.1950026 | 0.220205781 | 1 |

Similar situation with “Health and Personal Care” and “*Building Mat. & Garden Equip”.* Both,have no connection to each other and yet having high correlation of 0.87457653 or 87.5%. From the line graph we can see how two representative lines are almost identical. The smallest relation we can observe between “*Auto & Motor Vehicles”* and “*Building Mat. & Garden Equip”* resulting in 0.184021866 or 18.4%. Visually, we can observe how the two lines are having different shape.

|  |  |  |  |
| --- | --- | --- | --- |
| **Month 2004** | **Auto &  Motor Vehicles** | **Building Mat. &  Garden Equip** | **Health &  Personal Care** |
| Aug | $ 122,680 | $ 41,170 | $ 37,797 |
| Jul | $ 122,830 | $ 41,144 | $ 37,543 |
| Jun | $ 117,124 | $ 40,803 | $ 36,911 |
| May | $ 122,039 | $ 40,189 | $ 36,669 |
| Apr | $ 120,647 | $ 40,402 | $ 36,117 |
|  |  |  |  |
| Source: |  |  |  |
| [Business and Industry: Time Series / Trend Charts (census.gov)](https://www.census.gov/econ/currentdata/?programCode=MARTS&startYear=1992&endYear=2024&categories%5b%5d=44X72&dataType=SM&geoLevel=US&adjusted=1&notAdjusted=1&errorData=0) | | |  |
|  |  |  |  |
|  | *Auto &  Motor Vehicles* | *Building Mat. &  Garden Equip* | *Health &  Personal Care* |
| Auto & Motor Vehicles | 1 |  |  |
| Building Mat. & Garden Equip | 0.184021866 | 1 |  |
| Health and Personal Care | 0.413357033 | 0.87457653 | 1 |

Finally, the third scenario provides different outcome. Both, previous scenarios had positive correlation between segments. But in this scenario, we can clearly see two segments have negative correlation. For “Gasoline” and “Clothing” the correlation standing at -0.66978535 or -66.9%. We can interpret it as when prices for gasoline rise the sales for clothing decrease. Perhaps, may be because people must spend more on gasoline and keep less money in their pockets to spend on clothing. Similar situation between “Gasoline” and “Sporting Goods, Hobby, Musical Instrument & Book Stores.” Their correlation stands at -0.35225503 or -35.2%. It would make sense to think in a similar way as before. As soon as prices on gasoline rise people feel the pinch and spend less on discretionary non-essential goods that are less important. Thus, in both cases we observe negative pattern in people’s spending when fuel cost rise. From the graph we can see as the gasoline line upward sloping at the same time both clothing and sporting good lines are downward sloping.

|  |  |  |  |
| --- | --- | --- | --- |
| **Month 2004** | **Gasoline** | **Clothing** | **Sporting Goods Hobby  Musical Instrument  & Book Stores** |
| Aug | $ 51,983 | $ 26,097 | $ 8,169 |
| Jul | $ 52,604 | $ 26,276 | $ 8,146 |
| Jun | $ 52,340 | $ 26,248 | $ 8,218 |
| May | $ 53,440 | $ 26,227 | $ 8,226 |
| Apr | $ 54,663 | $ 25,893 | $ 8,129 |
|  |  |  |  |
| Source: |  |  |  |
| [Business and Industry: Time Series / Trend Charts (census.gov)](https://www.census.gov/econ/currentdata/?programCode=MARTS&startYear=1992&endYear=2024&categories%5b%5d=44X72&dataType=SM&geoLevel=US&adjusted=1&notAdjusted=1&errorData=0) | |  |  |
|  |  |  |  |
|  | *Gasoline* | *Clothing* | *Sporting Goods  Hobby Musical Instrument  & Book Stores* |
| Gasoline | 1 |  |  |
| Clothing | -0.66978535 | 1 |  |
| Sporting Goods, Hobby, Musical Instrument & Book Stores | -0.35225503 | 0.610935116 |  |
|  |  |  | 1 |