

Let's interpret and label the clusters based on the provided data patterns. The table shows the average values of Age, Annual Income (k\$), and Spending Score (1-100) for each cluster.

**Cluster 0: Possible Label: "Younger High Earners and Spenders"**

- **Average Age:** 32.69
- **Average Annual Income:** \$86.54k
- **Average Spending Score:** 82.13

**Interpretation:** This cluster is characterized by relatively young individuals with high income and high spending scores. These could be young professionals who are earning well and are likely to spend a significant portion of their income on discretionary or luxury items.

**Cluster 1: Possible Label: "Younger Low Earners, High Spenders"**

- **Average Age:** 25.27
- **Average Annual Income:** \$25.73k
- **Average Spending Score:** 79.36

**Interpretation:** This group consists of younger individuals with lower income but a high spending score. These might be younger adults, such as students or early-career professionals, who are spending a large portion of their income despite earning less, possibly on lifestyle or entertainment.

**Cluster 2: Possible Label: "Middle-aged High Earners, Low Spenders"**

- **Average Age:** 41.11
- **Average Annual Income:** \$88.20k
- **Average Spending Score:** 17.11

**Interpretation:** This cluster is composed of middle-aged individuals with high income but very low spending scores. These individuals may prioritize saving or investing over spending, indicating a conservative financial approach.

**Cluster 3: Possible Label: "Middle-aged Moderate Earners and Spenders"**

- **Average Age:** 42.72
- **Average Annual Income:** \$55.30k
- **Average Spending Score:** 49.52

**Interpretation:** This cluster includes middle-aged individuals with moderate income and moderate spending scores. These individuals may have balanced financial behavior, spending moderately while maintaining a stable income.

#### **Cluster 4: Possible Label: "Older Low Earners, Low Spenders"**

- **Average Age:** 45.22
- **Average Annual Income:** \$26.30k
- **Average Spending Score:** 20.91

**Interpretation:** This cluster is made up of older individuals with lower income and low spending scores. These could be individuals who are more financially conservative, possibly retired or nearing retirement, with a focus on saving rather than spending.

#### **Summary of Labels:**

- **Cluster 0:** "Younger High Earners and Spenders"
- **Cluster 1:** "Younger Low Earners, High Spenders"
- **Cluster 2:** "Middle-aged High Earners, Low Spenders"
- **Cluster 3:** "Middle-aged Moderate Earners and Spenders"
- **Cluster 4:** "Older Low Earners, Low Spenders"

#### **Insights:**

- **Age Factor:** Clusters 0 and 1 are younger, with Cluster 0 having both high income and spending, while Cluster 1 has lower income but still high spending. Clusters 2, 3, and 4 are older, with Cluster 2 having high income but low spending, Cluster 3 having moderate income and spending, and Cluster 4 having low income and low spending.
- **Income Factor:** Higher income does not necessarily correlate with higher spending. For example, Cluster 2 has the highest income but the lowest spending score.
- **Spending Patterns:** Younger individuals (Clusters 0 and 1) tend to have higher spending scores regardless of income, while older individuals (Clusters 2, 3, and 4) show more varied spending behavior, likely reflecting different financial priorities.

This interpretation can help businesses tailor their offerings and marketing strategies to better meet the needs of each customer segment, recognizing the different spending behaviors and income levels associated with each group.