**Analysis**

**1. How strongly does Affiliate Marketing spending explain changes in Product Sold?**

The R-squared (R²) value from the regression analysis is **0.374**. This means that **37.4%** of the variation in Product Sold can be explained by changes in Affiliate Marketing spending. This suggests a **moderate relationship**: while Affiliate Marketing spending does influence sales, it is not the only factor. Other elements such as product quality, seasonal trends, customer experience, and the performance of other marketing channels make up the remaining **62.6%** of sales variation.

From a marketing management standpoint, this finding supports **increasing investment in Affiliate Marketing** as a strategy to boost sales. However, it also highlights the importance of optimizing other marketing activities to fully maximize overall sales performance.

**2. Is the relationship between Affiliate Marketing spending and Product Sold statistically significant?**

Yes, the relationship is statistically significant. The p-value for the Affiliate Marketing variable is **0.000**, which is well below the standard threshold of **0.05**. This indicates that there is **very strong evidence** that changes in Affiliate Marketing spending are reliably associated with changes in Product Sold, and the relationship is **not due to random chance**.

For a marketing manager, this provides a **high level of confidence** to recommend increasing Affiliate Marketing budgets, as the link between spending and sales growth is strongly supported by statistical analysis.

**3. What is the estimated increase in Product Sold for each additional $1 spent on Affiliate Marketing?**

The slope coefficient for Affiliate Marketing spend is **3.7486**, according to the regression output. This indicates that for **every additional $1 spent** on Affiliate Marketing, the company can expect to sell approximately **3.75 more units** of product.

For example, increasing the Affiliate Marketing spend by **$1,000** is estimated to drive about **3,750 additional units sold**.  
This clear relationship allows marketing managers to **quantify the expected returns** for any additional investment in Affiliate Marketing, making budget planning more precise and data-driven.

**Suggested visualization:**  
A **line graph** plotting predicted sales against different spending levels would clearly illustrate how expected sales increase steadily with higher spending.

**4. Can we create a simple formula to predict Product Sold based on Affiliate Marketing spend?**

Yes, a simple predictive formula can be created using the regression output. The formula is:

Product Sold=(3.7486×Affiliate Marketing Spend)+5215.6016\text{Product Sold} = (3.7486 \times \text{Affiliate Marketing Spend}) + 5215.6016Product Sold=(3.7486×Affiliate Marketing Spend)+5215.6016

In this formula:

* **3.7486** represents the estimated number of additional units sold per $1 spent.
* **5215.6016** represents the baseline number of units sold without additional Affiliate Marketing spend.

Using this formula, marketing managers can **predict how many units will be sold** based on planned Affiliate Marketing budgets. For example:

| **Increase in Affiliate Marketing Spend** | **Expected Increase in Product Sold** |
| --- | --- |
| $500 | 1,874.30 units |
| $1,000 | 3,748.60 units |
| $1,500 | 5,622.90 units |
| $2,000 | 7,497.20 units |

This predictive tool is **very useful for budgeting and forecasting** future sales based on different marketing spend scenarios.

**5. How well does the model predict new (unseen) spending scenarios?**

The model predicts new spending scenarios **moderately well**, but it is not perfect. The R-squared value of **0.374** shows that **37.4%** of the variation in Product Sold is captured by Affiliate Marketing spending. This means that while Affiliate Marketing spend is a **significant driver**, other factors—such as product appeal, competitive activity, seasonality, and overall market dynamics—also play important roles.

**Strengths of the model** include the fact that the relationship between Affiliate Marketing spend and Product Sold is **highly statistically significant** (p-value < 0.001), and the model allows **reasonable and actionable predictions** when adjusting marketing budgets.

**Limitations of the model** are that over **60% of sales variation remains unexplained**. Therefore, Affiliate Marketing should be treated as **one important part of a broader marketing strategy**, and forecasts based on this model should be viewed as **useful guides rather than absolute predictions**. It is recommended to **update the model regularly with fresh data** to maintain its relevance and accuracy.