Here’s the interpretation of the ANOVA results for each categorical variable in the context of their influence on the dependent variable (likely "Annual Turnover"):

**1. City**

* **Sum of Squares (sum\_sq):** 1.64×10171.64 \times 10^{17}1.64×1017
* **Degrees of Freedom (df):** 161
* **F-Statistic (F):** 2.423722
* **p-value (PR(>F)):** 2.33×10−192.33 \times 10^{-19}2.33×10−19

**Interpretation**:

* The very low p-value (<0.05< 0.05<0.05) indicates that **City** has a statistically significant effect on the dependent variable.
* The high F-statistic suggests that the variation between different cities is large compared to the residual (within-group) variation, meaning **City** is an important factor.

**2. Restaurant Location**

* **Sum of Squares (sum\_sq):** 1.32×10151.32 \times 10^{15}1.32×1015
* **Degrees of Freedom (df):** 1
* **F-Statistic (F):** 2.929075
* **p-value (PR(>F)):** 0.087092

**Interpretation**:

* The p-value (0.087>0.050.087 > 0.050.087>0.05) indicates that **Restaurant Location** is not statistically significant at the 5% significance level.
* There is some evidence of a relationship, but it is not strong enough to confidently assert that **Restaurant Location** has a meaningful impact on the dependent variable.

**3. Endorsed By**

* **Sum of Squares (sum\_sq):** 3.01×10153.01 \times 10^{15}3.01×1015
* **Degrees of Freedom (df):** 2
* **F-Statistic (F):** 3.34697
* **p-value (PR(>F)):** 0.035311

**Interpretation**:

* The p-value (0.035<0.050.035 < 0.050.035<0.05) indicates that **Endorsed By** has a statistically significant effect on the dependent variable.
* The F-statistic is relatively small but still significant, suggesting that the endorsement factor contributes to the variability in the dependent variable.

**4. Restaurant Type**

* **Sum of Squares (sum\_sq):** 4.35×10154.35 \times 10^{15}4.35×1015
* **Degrees of Freedom (df):** 2
* **F-Statistic (F):** 4.851875
* **p-value (PR(>F)):** 0.00787

**Interpretation**:

* The p-value (0.00787<0.050.00787 < 0.050.00787<0.05) shows that **Restaurant Type** has a statistically significant impact on the dependent variable.
* The moderately high F-statistic further supports this conclusion, indicating that restaurant type is a relevant factor.

**5. Restaurant Theme**

* **Sum of Squares (sum\_sq):** 8.26×10158.26 \times 10^{15}8.26×1015
* **Degrees of Freedom (df):** 22
* **F-Statistic (F):** 0.834306
* **p-value (PR(>F)):** 0.684483

**Interpretation**:

* The p-value (0.684>0.050.684 > 0.050.684>0.05) indicates that **Restaurant Theme** is not statistically significant.
* The low F-statistic confirms that there is very little variation between groups compared to the residual variation, suggesting that the theme does not significantly influence the dependent variable.

**Summary Table of Significance:**

| **Variable** | **F-Statistic** | **p-value** | **Significant?** |
| --- | --- | --- | --- |
| City | 2.42 | <0.05< 0.05<0.05 | Yes |
| Restaurant Location | 2.93 | >0.05> 0.05>0.05 | No |
| Endorsed By | 3.35 | <0.05< 0.05<0.05 | Yes |
| Restaurant Type | 4.85 | <0.05< 0.05<0.05 | Yes |
| Restaurant Theme | 0.83 | >0.05> 0.05>0.05 | No |

**Conclusion:**

* **Significant Factors**:
  + **City**, **Endorsed By**, and **Restaurant Type** are significant factors that impact the dependent variable.
  + These variables should be explored further to understand their specific contributions.
* **Not Significant**:
  + **Restaurant Location** and **Restaurant Theme** do not significantly impact the dependent variable and may not warrant further detailed analysis unless there are theoretical reasons to consider them.