**Analysis and Conclusion**

**Question 1: How does square footage affect the listing price of residential properties in these three cities?**

**Cities in Focus**: **Guelph**, **Kitchener**, and **Windsor**

**Major Findings**: The correlation values between **square footage** and **listing prices** for all three cities are unexpectedly close to zero or negative, which suggests that square footage has a weak linear relationship with listing price in these cities. The correlation values are:

* **Overall**: 0.0039
* **Guelph**: -0.0231 (negative correlation)
* **Kitchener**: 0.0811 (weak positive correlation)
* **Windsor**: -0.0154 (negative correlation)

These weak correlations indicate that, in these cities, square footage alone does not have a significant impact on the listing price. The scatter plot visualizations for each city, along with the regression lines, support this finding by showing flat or nearly flat trends in the relationship between square footage and listing price.

* **Guelph**: The negative correlation in Guelph suggests that larger homes may be listed at slightly lower prices, which could be due to factors like property condition, location, or market demand that override the effect of square footage.
  + **Example**: Homes with around 1,500 sq. ft. have listing prices ranging from **$600,000** to **$900,000**, indicating no clear pattern based on size alone.
* **Kitchener**: The weak positive correlation of 0.0811 suggests that while larger homes are priced slightly higher, the relationship is not strong. This is further reflected in the scatter plot, where the data points are widely spread around the regression line, showing minimal association between size and price.
  + **Example**: Homes above 2,000 sq. ft. in Kitchener are priced between **$700,000** and **$900,000**, but similarly sized homes can have varying prices.
* **Windsor**: With a slightly negative correlation, square footage in Windsor has virtually no impact on listing prices. This suggests that factors other than home size, such as neighborhood quality, market saturation, or amenities, may play a more dominant role.
  + **Example**: Homes with similar square footage vary widely in price, from **$400,000** to **$600,000**, with no clear relationship between size and price.

**Conclusion**:

* **Kitchener** shows a weak positive relationship between square footage and listing price, but the effect is minimal.
* In **Guelph** and **Windsor**, square footage shows no meaningful impact on listing price, with correlations even suggesting slight negative relationships.
* These findings suggest that **other factors**, such as location, property type, or market conditions, are likely playing a larger role in determining listing prices in these cities.

**Question 2: What are the top three cities by number of bedrooms (including bathrooms)? How does the number of bedrooms (including bathrooms) affect the listing price of residential properties in these three cities?**

**Cities in Focus**: **Guelph**, **Toronto**, and **Kitchener**

**Major Findings**: The correlation values between **number of bedrooms (including bathrooms)** and **listing price** show similarly weak relationships. The correlation values are:

* **Overall**: 0.0010
* **Guelph**: -0.0144 (negative correlation)
* **Toronto**: 0.0558 (weak positive correlation)
* **Kitchener**: 0.0175 (weak positive correlation)

These values indicate that the number of bedrooms (including bathrooms) has little to no direct impact on listing prices in these cities. The box plot visualizations support this finding by showing a wide range of listing prices across different bedroom counts, with no clear pattern of increasing prices for homes with more bedrooms.

* **Guelph**: The negative correlation suggests that homes with more rooms may be priced slightly lower, which could be due to market demand for smaller homes or other factors affecting price.
  + **Example**: Homes with 3 rooms are listed between **$600,000** and **$900,000**, with no clear price increase as room count grows.
* **Toronto**: Despite being the largest market, the correlation between room counts and price is weak, with a correlation of 0.0558. This suggests that in Toronto, factors such as neighborhood, proximity to amenities, and property condition play a larger role in determining price than room count.
  + **Example**: Homes with 4-5 rooms in Toronto range from **$900,000** to over **$1.5 million**, indicating no consistent relationship between room count and price.
* **Kitchener**: The correlation of 0.0175 is weak, indicating a minimal impact of room count on price. The box plot shows overlapping price ranges across different room counts, further suggesting that the number of rooms is not a strong driver of price.
  + **Example**: Homes with 4 rooms in Kitchener have listing prices ranging from **$600,000** to **$900,000**, with significant overlap between homes with fewer or more rooms.

**Conclusion**:

* **Toronto** and **Kitchener** show a weak positive relationship between the number of rooms and listing price, but the effect is minimal.
* **Guelph** shows a slightly negative correlation, indicating that homes with more rooms may be priced lower.
* Overall, the number of bedrooms (including bathrooms) has little to no impact on listing prices, with other factors such as neighborhood or market conditions likely driving price variability.