AI Keyword Search Analysis Project Write-Up

Using Python and SQL, I analyzed Google Search ad performance data for AI-related keywords. The analysis focused on understanding how different keywords performed in terms of **impressions**, **click-through rate (CTR)**, and **average cost-per-click (Avg CPC)**.

A bar chart was created to visualize the **average click-through rate (CTR) by match type**, providing a clear comparison of how different keyword match types performed. The chart shows that "Exact match (close variant)" had the highest average CTR, followed by "Broad match" and "Phrase match (close variant)", while "Phrase match" and "Exact match" without close variants had lower CTRs. This shows that companies can boost engagement by prioritizing exact match keywords with close variants and testing broader match types, rather than relying solely on strict exact or phrase matches without variants.

In addition to the bar chart, I developed an **interactive scatter plot** where:

- Click-through rate is plotted on the y-axis
- Average cost-per-click is on the x-axis
- The size of each point represents the number of impressions

Users can toggle between **Broad**, **Phrase, Phrase Match (Close Variant)**, **Exact,** and **Exact Match (Close Variant)** match types to uncover strategic patterns:

- 🔥 **Top-left (High CTR, Low CPC):** Most efficient; keywords like, *"AI for data analysis"* (Broad Match) and *"AI coding assistant"* (Exact Match) show strong engagement at low cost — ideal for scaling.
- 😬 **Top-right (High CTR, High CPC):** Effective but expensive; keywords like, *"AI tools"* (Phrase Match) fits this, signaling potential for optimization or tighter targeting.
- 😐 **Bottom-left (Low CTR, Low CPC):** Low-performing but cheap; common across all match types, keywords like, *"AI software"* appears here in both Broad and Phrase variants despite high impressions (83 and 670, respectively).
- ❌ **Bottom-right (Low CTR, High CPC):** Least efficient; keywords like, *"AI tools"* (Exact Match) and *"AI apps"* (Exact Close Variant) fall here, suggesting candidates for budget cuts or strategic pause.

These insights are valuable for optimizing future keyword targeting strategies in paid ad campaigns, helping balance cost with performance.