**Intro to Data Analytics Exercise 1.6: Introduction to Analytical Methods**

* + **Scenario 1**: GameCo’s marketing team has noticed that puzzle game sales are down this year. The finance director wants a report on what’s causing this drop in sales, so the marketing team reach out to the analysts for help.
    1. This calls for a diagnostic analysis as we want to figure out why there is a drop in sales (why/how did).
    2. This is a multivariate analysis since we're concerned with the decline in global sales for puzzle games that can be influenced by many variables like the publishers, platforms, regions, etc. We would need to use inferential statistics which uses data from a sample and makes inferences about the larger population from which the sample is drawn.
    3. The 3 questions I would like to ask to get started on the analysis and why:
       1. Are puzzle games the only genre that has a drop in sales? This will help us understand if only specific genres were affected or all genres were affected.
       2. Is the drop in sales for puzzle games in all platforms or only specific platforms? This will help clarify whether other platforms are also experiencing a decline in sales for puzzle games and filter the specific platforms for analysis.
       3. How many puzzle games were released this year and how many puzzle games were released in the previous years? If there were less puzzle games released this year, then sales would follow a decrease too.
  + **Scenario 2**: The sales team wants to know which games it should stock in each city to meet local customer demand most effectively. Shipping rates vary by location and this difference will need to be reflected in which games are recommended for which locations.
    1. This calls for a prescriptive analysis because we are suggesting what game should be stocked to meet local customer demand most effectively. Prescriptive analysis prescribes what action to take to take advantage of a promising trend whereas predictive analysis tells us what is likely to happen.
    2. This is a multivariate analysis since we're concerned with the demand for individual games based on locations and as well as shipping rates to those locations. I think descriptive statistics would be required for this analysis since the sales team wants to know which games it should stock to multiple cities based on important characteristics/properties.
    3. The 3 questions I would like to ask to get started on the analysis and why:
       1. What are the most popular genres and platforms in each location? This will help narrow down the popular game titles to be shipped to each location.
       2. What are the shipping costs for each location? This will give an estimate of how much it would cost to ship the most popular games to each location. If the shipping rate is high but the demand is low for the game in location A, that game would not yield much profit and would not be recommended to the company to sell at location A. However, if the shipping rate is high and the demand is high for the same game in location B, that game would be very profitable and highly recommended to sell in location B.
       3. What is the shipping budget of the company? The shipping budget is significant to know because the most popular genre in a location might also be the most expensive to ship, which might not be optimal for yielding profits. Therefore, knowing the shipping budget will help the company get the most popular games to each location while sticking to the shipping budget.
  + **Scenario 3**: A GameCo executive is due to give a presentation at an upcoming gaming conference and they want to know how sales vary by month of the year.
    1. This calls for a descriptive analysis as we want to extract how sales vary by month (what happened).
    2. This is a bivariate analysis since we're only concerned with the sales and the month of the year and would use descriptive statistics. In the presentation, important characteristics like mean, median, mode, etc. can highlighted in charts, tables, or graphs to summarize data.
    3. The 3 questions I would like to ask to get started on the analysis and why:
       1. How many years of sales data should be included in the analysis? This will give an accurate representation of the highest grossing months.
       2. How are top games being defined? This helps clarify the criteria and filter the right games for the analysis.
       3. Which geographical locations should the analysis include? This will help sort monthly sales based on the locations.
  + **Scenario 4**: The Olympic Games will take place in six months. GameCo’s operations team wants to forecast how many sports games it will sell in the months before, during, and after the games so it can order the correct amount from the production facility.
    1. This calls for a predictive analysis as we want to predict the future sales of sports games (what will happen) from the data.
    2. This is a multivariate analysis since we're concerned with the sales of sports games and comparing the three timings of the Olympic Games (before, during, and after). Based on the article that you provided, I think inferential statistics should be used. Inferential statistics use statistical models to help compare sample data to other samples or to previous research. Therefore, by using previous sales data for sports games when the Olympics took place, we can make current inferences about how many sports games it will sell in months before, during, and after the games.
    3. The 3 questions I would like to ask to get started on the analysis and why:
       1. Are there previous sales data for sports games when the Olympics took place? This will help identify patterns and make predictions.
       2. How many months before and after the Olympic Games are we looking to analyze? This clarifies how many months we should do the predictive analysis.
       3. How many top games should I consider? Top 3, top 10, or games comprising, say, 40% of total sales? This tells me how much information to provide to the marketing team.