**SQL**

**Basic Queries**

1. **Retrieve Data**
   * **Write a query to list the names and nationalities of all players.**
   * **Retrieve players whose overall rating is above 90.**
2. **Sorting**
   * **List the top 10 players based on their overall rating.**
   * **Display players sorted by age in descending order.**

**Filtering**

1. **Conditions**
   * **Find all players who belong to a specific club (e.g., "FC Barcelona").**
   * **Retrieve players with a potential rating greater than their current rating.**
2. **Range and Patterns**
   * **List all players aged between 20 and 25.**
   * **Find players whose names start with "Cristiano".**

**Aggregations**

1. **Summary Statistics**
   * **Calculate the average overall rating of players.**
   * **Find the total number of players from Brazil.**
2. **Grouping**
   * **Group players by nationality and calculate the average overall rating for each group.**
   * **List the number of players in each club.**

**Joins**

1. **Combine Data**
   * **If you split data into multiple tables (e.g., Player Info and Player Skills), write a query to combine them using a join.**

**Complex Queries**

1. **Subqueries**
   * **Find the second-highest rated player.**
   * **List all clubs where the average age of players is below 25.**
2. **Nested Filters**
   * **Retrieve players whose value (e.g., "Value" column) exceeds the average player value.**

**Updates and Inserts (If Using a Database)**

1. **Modifications**
   * **Update the wage of a player.**
   * **Insert a new player into the database.**

**Intermediate Queries**

1. **Conditional Aggregations**
   * **Count how many players have a preferred foot as "Left."**
   * **Find the average "Wage" of players who are under 25 years old.**
2. **Multi-Column Filters**
   * **List all players who play in the "ST" (Striker) position and have an overall rating above 85.**
   * **Find players who have a "Crossing" skill higher than 80 and "Finishing" skill higher than 85.**
3. **Top-N Queries**
   * **List the top 5 youngest players with the highest overall rating.**
   * **Find the top 3 players with the most "Hits" in each club.**

**Advanced Aggregations**

1. **Window Functions**
   * **Rank players by their "Overall Rating" within each club.**
   * **Calculate the cumulative sum of "Hits" for players in descending order of "Hits."**
2. **Percentiles**
   * **Determine the median "Overall Rating" of all players.**
   * **Find players whose "Wage" is in the top 10% of all players.**
3. **Pivot and Roll-Up**
   * **Create a summary of the total "Hits" by nationality.**
   * **Display a roll-up summary showing the total players by position and nationality.**

**Complex Joins and Relationships**

1. **Self Joins**
   * **Find pairs of players from the same club with the same "Best Position."**
   * **Identify players who share the same nationality but play for different clubs.**
2. **Correlated Subqueries**
   * **Find players whose "Overall Rating" is above the average for their club.**
   * **Retrieve players with the highest "Wage" in their respective clubs.**
3. **Set Operations**
   * **Create two groups: players with "Potential Rating" over 90 and those with "Overall Rating" over 90. Find players in both groups (INTERSECT).**
   * **List players who are under 20 but do not play in the "Top 5" leagues (EXCEPT).**

**Data Manipulation**

1. **Insert and Update**
   * **Insert a new player into the database with custom values for "Name," "Age," "Club," and "Overall Rating."**
   * **Update all players' "Wage" by increasing it by 10% for those with an "Overall Rating" above 85.**
2. **Delete**
   * **Remove players from the database whose "Contract" has expired (e.g., NULL in "Loan Date End").**

**Real-World Scenarios**

1. **Budgeting**
   * **Calculate the total "Value" of all players in a club.**
   * **Find the club with the highest total player "Wage."**
2. **Performance Comparison**
   * **Compare the average "Overall Rating" of players in "Premier League" vs. "La Liga."**
   * **Identify the top 3 clubs with the highest average "Defending" stats.**

**Analytical Insights**

1. **Trend Analysis**
   * **Find the number of players who joined their current club each year (based on the "Joined" column).**
   * **Calculate the average "Potential Rating" for players by age group (e.g., 18-22, 23-27).**
2. **Skill-Based Queries**
   * **List the top 5 players with the highest "Dribbling" stats.**
   * **Find players with "Crossing," "Finishing," and "Short Passing" all above 90.**
3. **Value Analysis**
   * **Identify players whose "Value" is more than twice their "Release Clause."**
   * **List players with a "Wage" greater than the average "Wage" for their position.**

**Database Design Queries**

1. **Normalization**
   * **If breaking the data into separate tables (e.g., Player Info, Skills, Contracts), write queries to rebuild the relationships.**
   * **Write a query to find inconsistencies, such as duplicate player IDs or missing data in mandatory fields.**

**Challenge Questions**

1. **Custom Rankings**
   * **Create a custom ranking for players based on their "PAC," "SHO," and "DRI" stats weighted equally.**
   * **Rank players by their "Total Stats" within each nationality.**
2. **Dynamic Filtering**
   * **Write a query to find players whose overall rating is within 5% of their potential rating.**
   * **Filter players whose "Position" includes multiple roles (e.g., "CAM, CM").**
3. **Multi-Step Analysis**
   * **Identify the most common "Best Position" by nationality.**
   * **Find the player with the highest "Wage" in each position, grouped by age range.**

**Tableau**

**Basic Visualizations**

1. **Bar Charts**
   * **Create a bar chart showing the top 10 clubs with the highest average "Overall Rating."**
   * **Visualize the count of players by nationality.**
2. **Pie Charts**
   * **Display the distribution of players by "Preferred Foot" (e.g., Left vs. Right).**
   * **Create a pie chart showing the share of players in different "Best Positions."**
3. **Line Charts**
   * **Plot the trend of average "Overall Rating" by player age.**
   * **Show the total "Value" of players over years based on their "Joined" date.**

**Intermediate Visualizations**

1. **Scatter Plots**
   * **Create a scatter plot of "Overall Rating" vs. "Potential Rating" with player "Age" as a color or size dimension.**
   * **Visualize "Value" vs. "Wage" to explore outliers and trends.**
2. **Histograms**
   * **Plot a histogram to show the distribution of "Age" for all players.**
   * **Create a histogram to analyze the frequency of players by "Overall Rating" ranges.**
3. **Heatmaps**
   * **Display a heatmap of clubs vs. nationalities, showing the number of players in each combination.**
   * **Create a heatmap showing average "Wage" by "Best Position" and "Preferred Foot."**

**Advanced Visualizations**

1. **Box Plots**
   * **Create a box plot showing the distribution of "Wage" for each "Best Position."**
   * **Plot a box plot for "Overall Rating" grouped by age ranges (e.g., 18-22, 23-27).**
2. **Maps**
   * **Create a map to visualize the number of players from each country.**
   * **Show the total "Value" of players for each nationality on a map.**
3. **Treemaps**
   * **Visualize the distribution of total "Value" across different clubs using a treemap.**
   * **Create a treemap for players grouped by "Best Position" and their "Wage."**

**Comparison and Ranking**

1. **Rankings**
   * **Create a ranking of the top 10 players by "Overall Rating" using a dynamic filter to switch between "Best Positions."**
   * **Build a visualization to compare the top 5 clubs with the highest average "Wage."**
2. **Side-by-Side Bar Charts**
   * **Compare the "Overall Rating" and "Potential Rating" for players in the top 5 clubs.**
   * **Show a comparison of average "Value" and "Wage" by "Best Position."**
3. **Stacked Bar Charts**
   * **Visualize the distribution of players in different "Best Positions" for each nationality.**
   * **Create a stacked bar chart showing the number of players in each "Preferred Foot" for each age range.**

**Dynamic Dashboards**

1. **Filters and Actions**
   * **Build a dashboard to filter players by age, "Best Position," and nationality, showing their "Overall Rating" and "Wage."**
   * **Create a dashboard comparing clubs with interactive filters for "Best Position" and "Potential Rating."**
2. **KPI Dashboard**
   * **Design a dashboard showing the total number of players, average "Overall Rating," and total "Value" for the selected club.**
   * **Create KPIs to show the top-performing nationalities based on average "Overall Rating" and total "Wage."**

**Insights and Analysis**

1. **Age vs. Performance**
   * **Plot "Age" against "Overall Rating" to identify the prime age range for high-rated players.**
   * **Analyze how "Potential Rating" changes across age groups.**
2. **Value vs. Skills**
   * **Visualize the relationship between "Total Stats" and "Value."**
   * **Compare "Dribbling" and "Finishing" stats for players in attacking positions.**
3. **Club Performance**
   * **Analyze the distribution of players' "Total Stats" across clubs.**
   * **Identify the clubs with the most players above a specific "Overall Rating" threshold.**

**Trend Analysis**

1. **Time-Based Trends**
   * **Analyze the trend of players joining different clubs over the years.**
   * **Show the evolution of player "Value" over their career (based on "Joined" date and age).**
2. **Skill Progression**
   * **Create a timeline visualization for the improvement of players' "Overall Rating" and "Potential Rating" over the years.**
   * **Analyze changes in "Value" and "Wage" for players grouped by "Best Position."**

**Predictive and What-If Analysis**

1. **Predictive Insights**
   * **Build a visualization predicting "Overall Rating" based on "Age" and "Potential Rating."**
   * **Create a dashboard for what-if analysis to see how increasing "Wage" affects the club’s total budget.**