Senior Manager, Advanced Analytics, Marketing Interview Preparation

Analytics and Statistics

1. **Descriptive Statistics**: Measures of central tendency (mean, median, mode), measures of variability (range, variance, standard deviation), data visualization (histograms, box plots, scatter plots)
2. **Inferential Statistics**: Hypothesis testing (null and alternative hypotheses, p-values, significance levels), confidence intervals, statistical modeling (linear regression, logistic regression)
3. **Causal Inference**: Instrumental variables, regression discontinuity design, propensity scoring
4. **Experimentation**: A/B testing, randomized controlled trials (RCTs), quasi-experiments

Practice Examples: Analytics and Statistics

1. A company wants to analyze the relationship between user engagement and retention. They collect data on the number of sessions per user and the percentage of users retained after 30 days. What type of analysis would you perform?
2. A marketing team wants to compare the effectiveness of two different ad creatives. They run an A/B test and collect data on click-through rates (CTRs) for each ad. How would you analyze the data?
3. A product team wants to forecast sales for the next quarter. They provide you with historical sales data and ask you to develop a model to predict future sales.

SQL and Data Science

1. **SQL**: Query optimization, data modeling, data warehousing
2. **Data Science**: Machine learning (supervised, unsupervised, reinforcement learning), deep learning, Large Language Models (LLMs)
3. **Data Modeling**: Entity-relationship models, data warehousing

Practice Examples: SQL and Data Science

1. Write a SQL query to extract the top 10 products by revenue from a table of sales data.
2. A company wants to build a recommendation engine to suggest products to users based on their purchase history. What type of algorithm would you use?
3. A data scientist wants to use a machine learning model to predict customer churn. What type of model would you recommend?

Business Strategy and Growth

1. **Market Analysis**: Market sizing, competitor analysis, market trends
2. **Growth Strategies**: User acquisition, retention, revenue growth
3. **Product Development**: Product life cycle management, feature prioritization

Practice Examples: Business Strategy and Growth

1. A company wants to expand into a new market. What factors would you consider when evaluating potential demand?
2. A marketing team wants to optimize ad spend across channels. How would you approach this?
3. A product team wants to prioritize features for the next release. What factors would you consider?

Product Growth and Optimization

1. **Product Analytics**: Metrics (activation, engagement, retention), funnel analysis
2. **Experimentation**: A/B testing, multivariate testing
3. **Feature Impact Analysis**: Measuring feature adoption, retention, revenue impact

Practice Examples: Product Growth and Optimization

1. A company wants to increase user engagement. What metrics would you use, and how would you identify areas for improvement?
2. A product team wants to A/B test a new feature to increase conversion rates. How would you design the experiment?
3. A company wants to optimize onboarding to reduce friction and increase retention.

Marketing and Acquisition

1. **Marketing Metrics**: ROI, ROAS, CAC, LTV
2. **Marketing Channels**: Paid advertising, organic marketing
3. **Customer Segmentation**: Demographic, behavioral, psychographic segmentation

Practice Examples: Marketing and Acquisition

1. A company wants to measure social media marketing effectiveness. What metrics would you use?
2. A marketing team wants to use attribution modeling. What type of model would you recommend?
3. A company wants to optimize customer acquisition to reduce costs and increase ROI.

Tools and Utilities

1. **Data Visualization**: Tableau, Power BI, D3.js
2. **Statistical Software**: R, Python (pandas, NumPy, scikit-learn)
3. **Data Engineering**: Apache Spark, Hadoop, AWS Glue

Practice Examples: Tools and Utilities

1. A data analyst wants to create interactive dashboards. What tools would you recommend?
2. A company wants to use machine learning to predict customer churn. What tools would you use?
3. A data engineer wants to optimize the data pipeline. What tools would you recommend?

Growth Analytics and Experimentation

1. **A/B Testing**: Hypothesis testing, sample size calculation, test duration
2. **Experiment Design**: RCTs, quasi-experiments
3. **Results Interpretation**: Statistical significance, practical significance