FACEBOOK

DATA SCIENCE — ANALYTICS

Initial Interview Guide

Welcome to your prep guide for your data scientist initial interview at the Facebook company. Our data scientists and recruiters put together this guide so you know what to expect and how to prepare.

As your recruiter might have mentioned, the data scientist role at Facebook is defined a little differently than at other companies. As you're preparing, it might be helpful to keep in mind the core work of our data scientists:

- Use quantitative tools to uncover opportunities, set team goals and work with cross-functional partners to guide the product roadmap.

- Explore, analyze and aggregate large data sets to provide actionable information, and create intuitive visualizations to convey those results to a broad audience.

- Design informative experiments considering statistical significance, sources of bias, target populations, and potential for positive results.

- Collaborate with engineers on logging, product health monitoring, and experiment design / analysis.

Interview overview

The structure of your initial interview

Your initial interview will be a 45-minute video conference with a Facebook data scientist. The interview will include these sections:

- **Analytical:** 10 – 20 minutes.
- **Technical:** 10 – 20 minutes.
- **Q&A:** 5 minutes.

What we're looking for:

Throughout both parts of your interview, your interviewer will be looking for:

- **Framing:** Can you structure and see data to answer a fairly open-ended question?
- **Operationalization:** Can you translate the concepts generated into the specific actions?

- **Analytical Understanding:** Can you translate between numbers and words (i.e. prove to your interviewer that product "X" should be built through data resulting in analytical proof)?
- **Hypothesis Driven:** Can you identify reasonable hypotheses and apply basic logic to support those hypotheses? Can you identify hypotheses, and do you understand how to look at data to confirm or refute a product insight?

Analytical discussion

How to prep for this section of your interview

The analytical component of your initial screen is designed to help your interviewer gain an understanding of your product sense. The questions we ask will give you an opportunity to show your interviewer how you solve business questions and problems, as well as how creative and articulate you are at thinking through these problems while solving them. Know that it's not about arriving at the perfect or correct answer, but rather how you engage with the problem.

To prepare, spend some time engaging with Facebook Products less as a user and more as someone who is tasked with improving or developing these products. **This link outlines what we consider a "Facebook Product,"** such as Ads, Mobile, Timeline, News Feed, Messaging, etc. (Note: This isn't a complete list, and the analysis case may not refer to one of the products listed.)

Technical discussion

How to prep for this section of your interview

During the technical component of your interview, your interviewer will be assessing your ability to translate a high-level question into an execution strategy, and explain how the result is relevant and what aspects may still be lacking.

Example Questions

We'll give you one to two data-processing questions during this portion. This example doesn't pertain to Facebook, but it's representative of the data and questions you may see:

Knowing the following:

- An attendance log for every student in a school district with: attendance_events : date | student_id | attendance
- A summary table with demographics for each student in the district: all_students : student_id | school_id | grade_level | date_of_birth | hometown

Using this data, how would you answer the following?

- What percent of students attend school on their birthday?
- Which grade level had the largest drop in attendance between yesterday and today?

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What You Should Know

Regardless of your language, you should be familiar with how to:

- Work with grouping and aggregate functions.
- Utilize different types of joins (left, inner, outer, etc.) including when and how to use a self-join.
- Append multiple data sources (union in SQL, concat in Pandas, bind_rows in R).
- Filter data by multiple, complex conditions.
- De-duplicate, sort, handle missing / incomplete data.
- Assess efficiency. This won't be a primary focus, but we may ask you to think of more efficient ideas or to explain why you're making certain efficiency / simplicity tradeoffs.

Using SQL

- You may work in whatever dialect you like, but you'll be able to answer all questions with ANSI-standard functions (think PostgreSQL). If you use a dialect-specific syntax, you may need to explain it to your interviewer.
- Try to maintain a consistent capitalization / indentation style for readability.

Using Python or R

- Given the heavy focus on data manipulation, most people choose to use libraries, such as Pandas / NumPy in Python or dplyr in R. It's possible to solve the questions in pure Python / R (or any Turing-complete language), but doing so will likely be much slower and more difficult.
- The interview will either be on a whiteboard or in a plain text environment, so there'll be no access to function autocomplete or help documentation.
- A few small mistakes in syntax won't automatically disqualify you, but pseudocode or a general explanation isn't acceptable. Be sure that you know the function names, input arguments, etc., to implement the core skills listed above.
- Interviewers generally know the most widely used libraries, but there's no guarantee that any individual interviewer will be familiar with the libraries you're mentioning. That's OK, but you may have to provide more guidance / context around what you're writing.
- If you don't have much experience performing joins and aggregations, you may wish to review that functionality for Python or R.

Using Another Language

- Most people work in SQL, Python or R, but we may be able to accommodate other languages. If you want to work in another language, discuss ahead of time with your recruiter.
- As mentioned above, you may choose a language or approach without built-in support for advanced data manipulation / aggregation, for instance pure Python, Java or C++. But we'll still expect you to complete the same questions, so time may be more of a factor.

6 tips for the day of your interview

What to keep in mind while you're interviewing

1. Think out loud.

Provide a narrative as you go through the problem so that the interviewer has insight into your thought process.

2. Deconstruct problems.

Deconstruct complicated or ambiguous problems into groups, and combine the groups for solution.

3. Hints.

Pivot your answer if your interviewer prompts you that you're heading in the wrong direction.

4. Clarification.

Ask clarifying questions during the interview.

5. Say why you're interested in a career at Facebook.

Facebook interviewers like to see people who know about our environment, projects, challenges, etc.

6. Questions.

Ask questions about Facebook and analytics if there's time.

Remember to Think Like a Product Owner

Keep in mind to put yourself in the position of the product team that built the product / feature for both parts of your interview. Show that you're thinking about these questions:

- Why do you think they made certain decisions about how it works?
- What could you do to improve the product?
- What kind of metrics would you want to consider when solving for questions around a product's health, growth, or engagement?
- How would you measure the success of different parts of the product?
- What metrics would you assess when trying to solve business problems related to our products?
- How would you tell if a product is performing well or not?
- How would you set up an experiment to evaluate any new products or improvements?

Appendix / resources

Links to exercises, information, and guides to help you prepare

While we recognize that people interviewing with Facebook may utilize outside sites / resources with posted interview questions and answers, we encourage caution, as we've found many of the proposed solutions to be incorrect. Our data scientists and recruiters have compiled these trusted links for you to review while you prep.

About Facebook

- **Facebook News**
- **Facebook Products**
- **Facebook Data & Analytics Stories**
- **VP of Analytics Alex Schultz's Talk at Stanford on Growth at Facebook**
- **How Facebook Used Science and Empathy to Reach Two Billion Users**
- **How We Shipped Reactions**
- **Facebook Quarterly Earnings**

Analytical prep

- **A Summary of Udacity A/B Testing Course**
- **The Pitfalls of A/B Testing in Social Networks**

Technical prep

- **SQL Course**
- **Mode Analytics SQL Tutorials**
- **HackerRank**

Thanks for taking the time to review this guide and good luck in the interview - you'll do great!