



INTERVIEW PREP GUIDE: DATA SCIENTIST

CONGRATULATIONS ON YOUR UPCOMING INTERVIEW DAY WITH CAPITAL ONE!

We have been impressed with your background so far and can't wait to meet you in person. At Capital One, we value well-rounded associates and our selection process has been built to reflect the unique skill sets we look for on our Data Science teams. Our Data Scientists engage in critical work across Capital One, including designing rich data visualizations, building machine learning models, writing software to investigate messy data sets, and using Big Data tools to conduct analysis. Successful Data Scientists at Capital One are creative, curious, analytical, and customer-focused problem solvers; your time with us will challenge you on those dimensions.

As you prepare for your interviews, please use this guide as a point of reference to answer any questions you may have. Your interview day will consist of four structured interviews: two Analyst Cases, one statistical Role Play Interview, and one Technical Interview. The Technical Interview and each Analyst case interview will also include a behavioral question at the beginning. You will also have one unstructured job fit discussion with the Data Science team.

NOT SURE WHAT THOSE INTERVIEWS LOOK LIKE? KEEP READING!

ANALYST CASES

WHAT THEY ARE: The Analyst Case is an interactive interview where you're tasked with solving a real-life business problem. Your caser will work through a business question with you, while evaluating your strategic thinking, analytical skills, and quantitative abilities as you solve for solutions.

WHY THEY'RE INCLUDED: As a Data Scientist at Capital One, your teams will work with data every day. While we're not looking for you to solve complex algebraic equations by hand, we are looking for candidates with an analytical mindset. You need to be able to understand data, communicate effectively with both business leaders and technical teams, and leverage data to make the best decisions for our customers.

ROLE PLAY INTERVIEW

WHAT IT IS: The Role Play Interview is an interactive interview where you're tasked with presenting recommendations based on given business or statistical analysis. You will present your recommendations as if you are a Consultant and the interviewer is a Business Manager without a statistical or quantitative background.

WHY IT'S INCLUDED: As a Data Scientist at Capital One, you will often be asked to draw insights and develop recommendations based on statistical analysis. Your ability to communicate those findings in a clear manner, especially to those who do not have a data science background, will be critical to your success.

EQ Questions

WHAT THEY ARE: The Technical Interview and each case will begin with a behavioral question designed to get to know you better. The interviewer will ask an open-ended question meant to start your conversation and allow the interviewer to learn more about how you approach work and projects.

WHY THEY'RE INCLUDED: Analytical and quantitative abilities are important to us, but cultural and team fit are just as important. We want to get to know you on a more personal level and gain some insight into how you'll fit in with diverse, collaborative teams here at Capital One. No need to prepare for this part of the interview, just be yourself!

TECHNICAL INTERVIEW

WHAT IT IS: The Technical Interview consists of three parts: discussion of your Coding Challenge, discussion of your resume, and a whiteboarding exercise.

WHY IT'S INCLUDED: Because the Technical Interview has several parts, you must remain flexible throughout the interview. During the discussion of your Coding Challenge, the interviewer hopes to understand your approach and evaluate your ability to communicate the work you completed prior to your interview. We also know it can be challenging to condense your qualifications onto a one-page resume, so we want to provide the opportunity to elaborate on your past experiences. Finally, the whiteboard exercise is a thought exercise to challenge your problem solving and communication skills.

JOB FIT DISCUSSION

WHAT IT IS: The Job Fit Discussion is the least structured and most informal of your interview experience. The interviewer may ask you about your interest in the role, your career aspirations, or your resume. This is also a great time to ask the interviewer any questions you may have about the role or Capital One.

WHY IT'S INCLUDED: Analytical and quantitative abilities are important to us, but cultural and team fit are just as important. We want to get to know you on a more personal level and gain some insight into how you'll fit in with diverse, collaborative teams here at Capital One. We want to confirm your comfort with handling the responsibilities and determine if the role is a good fit for your career aspirations. Just be yourself!

THE CASE INTERVIEW

WELCOME TO YOUR CASE INTERVIEWS! Case Interviews are interactive interviews where you're tasked with solving a real-life business problem, like the ones that Capital One associates tackle every day. Your caser will work through a broad business question with you, broken down into multiple pieces, until you arrive at a solution together.

WHAT WE'RE LOOKING FOR:

Remember, a Case Interview is not a mathematics exam—we want to evaluate your skill set holistically. It's not just about “solving for the right number”—it's more about how you problem solve in general. We're looking for candidates who exhibit strong communication skills, conceptual thinking, analytical abilities, and strategic business sense. The questions that comprise your cases will give you the chance to demonstrate those skills and more.

ANALYST CASE CONTENT	WHAT IS THE CASE LIKE?
Content focuses on a strategic business question, which could be based upon a variety of business topics	<p>Involves solving a real-life business problem with your interviewer</p> <p>Interactive in nature</p> <p>Used to evaluate your analytical skills, conceptual problem-solving skills, and communication skills</p>

READY TO PRACTICE?

Now that you've heard more about Case Interviews, what exactly do we mean by "analytical"? As a data-driven organization, we want to make sure you have a certain level of fluency with numerical reasoning and problem solving. While brushing up on your math skills, some great places to start are practicing break-even equations and weighted averages.

BREAK-EVEN EXAMPLE: If I need to make \$40,000 this year and I make \$20 per pair of shoes, how many pairs of shoes do I need to sell? **$40,000 = 20x$, $x = 2,000$ pairs of shoes**

WEIGHTED AVERAGES EXAMPLE: A group of 15 students took the SAT, eight of them had an average score of 660, and the other students had an average score of 720. What is the average score of the whole group? **$((8 \times 660) + (7 \times 720)) / 15 = 688$**

You can see where those analytical skills come into play during a real case. A sample Capital One case is included below. We highly recommend having a friend or family member give you this case out loud, so you can get a better feel for the Case Interview interaction model.

TIME TO SHOW YOUR STUFF!

SAMPLE CASE:

Background Information:

- You are a manager at a company that markets various products and services and is looking to diversify.
- You receive some information that indicates magazine publishing may be interesting.
- You are considering developing a new magazine but are not sure how profitable it might be.

What are some of the issues you must consider when evaluating the business?

Things to consider:

- Defining the target market
- Competition (# of competitors, fragmentation, brand name)
- Build off core competencies
- Barriers to entry
- Business cycle stage
- Method of measuring viability
- Opportunity cost

The next step is to understand the economics of the business. What are the profit drivers in the magazine publishing business?

Main profit drivers of the publishing business include:

Sources of Revenue:

- Subscriptions
- Newsstand sales
- Advertising
- Customer lists
- Internet

Costs:

- Printing
- Distribution
- Content development
- Marketing / promotions

SAMPLE CASE CONTINUED:

Through some initial research, you have been able to determine the following:

- You can charge \$25 for an annual subscription of 50 issues
- Let's ignore newsstand sales for now
- You can generate \$1 in advertising revenue per issue for each subscription
- Printing and distribution costs are \$1 per copy per issue
- Content development costs run \$1 million per year
- Let's ignore marketing expenses for now

How much profit will you generate a year from one incremental subscription?

- Subscription revenue per year = \$25
- Advertising revenue per year = \$50
(\$1/issue X 50 issues)
- Yearly production and distribution costs = \$50
(\$1/issue X 50 issues)
- **Profit from one incremental subscription = \$25
(\$25 + \$50 - \$50)**

How many subscriptions do you need to sell to break even?

- Profit (contribution margin) = \$25 per subscription
- Magazine content development = \$1 million per year
- **Break even = \$1 million/\$25 = 40,000 subscriptions**

What about marketing costs?

- Your company has expertise in direct mail solicitation, so you decide to use that marketing method.
- Each piece of mail costs \$0.50
- You are able to achieve a 2% response rate

How much does it cost you to sign up a subscriber?

- Cost per subscriber calculation
- Cost of mailing / response rate = cost to sign up one subscriber
- **\$0.50 / 2% = \$25 per subscriber**
- Another way to calculate cost per subscriber:
 - Assume you mail offer to 100 people
 - Costs = \$50 (\$0.50 x 100 people)
 - Responders = 2 (2% of 100)
 - **Cost per responder = \$25 (\$50 / 2)**

How will this affect your break-even calculation?

- New break-even calculation
- Old contribution margin - Marketing costs = New contribution margin
- **New contribution margin = \$25 - \$25 = \$0**
- **Ouch!**

What can we do to make this venture better?

- Raise subscription prices
- Increase response rate
- Raise advertising rates
- Make each response matter more; consider renewals and multi-year subscriptions
- Reduce production costs

THE ROLE PLAY INTERVIEW

WELCOME TO YOUR ROLE PLAY INTERVIEW! The Role Play Interview is an interactive interview where you're tasked with presenting recommendations based on given information. The interviewer will present you with a business or statistical analysis. You will be given time to review the information and then present your observations and recommendations to the interviewer. You will present the information as if you are a Consultant and the interviewer is a Business Manager without a statistical or quantitative background. You will want to present the information in laymen's terms based on the information you have.

WHAT WE'RE LOOKING FOR:

We want to evaluate your skill set holistically throughout this interview. We're looking for candidates who exhibit the following characteristics.

- **Strong communication skills:** communicate in a clear, concise manner and walk your interviewer through your process
- **Strategic business insight:** consider how the data relates to the relevant business
- **Feature engineering:** show your creativity through your suggestions and observations
- **Investigator approach:** be curious throughout the interview and try to determine the reasons behind the analysis
- **Modeling instinct:** show your understanding of different models and consider the benefits and drawbacks of given models

HOW DO THE INTERVIEWS COMPARE?

The Case Interviews and Role Play Interview are similar in many ways; however, understanding the differences will help you prepare.

ANALYST CASE	BOTH	ROLE PLAY INTERVIEW
Content focused on a strategic business question	Involve solving a real-life business problem, which could be based upon a variety of business topics	Content focused on statistical analyses
Includes calculations	Interactive in nature	Does not include calculations
You and the interviewer will work through the case as a team	Evaluate your analytical skills, conceptual problem-solving skills, and communication skills	You will act as a Consultant and the interviewer as a Business Manager

THE TECHNICAL INTERVIEW

WELCOME TO YOUR TECHNICAL INTERVIEW! The Technical Interview is made up of three parts: discussion of your Coding Challenge, resume review, and a whiteboard exercise.

WHAT DO THESE LOOK LIKE?

Because the Technical Interview has several parts, you must remain flexible throughout the interview. Keep reading to understand what each section will include!

CODING CHALLENGE	RESUME REVIEW	WHITEBOARD EXERCISE
<p>What is it? The interviewer will ask questions to understand the work you completed prior to your interview day, your thought process, and approach</p> <p>How to prepare: Take time to review the work you completed for the Coding Challenge</p>	<p>What is it? The interviewer could ask about anything they find interesting on your resume (e.g., internship, extracurricular activities, a programming language, etc.)</p> <p>How to prepare: Review and talk through your resume with a friend or family member</p>	<p>What is it? This is a thought exercise in which you'll work through a problem using a decision tree, pseudo code, or any coding language</p> <p>How to prepare: Be prepared to work through a problem with your interviewer and communicate your process along the way</p>

WANT MORE?

As you prepare for your interview day, please reference the additional resources below.

The Capital One Case Interview video is a fantastic resource for learning what Case Interviews really feel like.

Capital One Case Interview video

LOOKING AHEAD...

Remember that earning an Interview Day is no easy task, and we can't wait to meet you in person. If you have any questions before you come on site, don't hesitate to reach out to your recruiter. Best of luck!

INTERVIEW DAY FAQs:

CASE INTERVIEWS

How long do the Case Interviews last?

On your schedule, your Analyst Case Interviews are slotted for one hour each. Breaks and lunch will also be included in your schedule.

Will I be able to use a calculator?

Yes, a calculator and scratch paper will be provided for both interviews.

ROLE PLAY INTERVIEW

How long will I have to review the given statistical analysis?

The interviewer will step out of the room for 15-20 minutes as you review the information.

TECHNICAL INTERVIEW

Should I prepare a presentation for the discussion of my Coding Challenge?

You are welcome to prepare a short presentation to help organize your thoughts; however, this is not required. Because the Technical Interview has three parts, you will only have about 15 minutes to discuss your Coding Challenge.

Can I use any coding language during the whiteboard activity?

Yes, you can use any coding language; however, we encourage you to solve the problem using a decision tree or pseudo code.