1 Types of Product Interview Questions

- Defining a product metric
  - What metrics would you analyze to validate changes to an existing feature?
  - What metrics would you analyze to validate their hypothesis?
- Diagnosing a metric change
  - How would you investigate the root cause behind a metric going up or down?
  - What if other metrics changed at the same time?
- Barinstorming product features
  - Should a company launch a new product?
  - What feature ideas would improve a certain metric?
- Designing A/B tests
  - How would you set up an A/B test to measure the success of a new feature?
  - What are some likely pitfalls you might run into while performing A/B tests and how would you deal with them?

2 Big-Picture Advice

- Ask clarifying questions
  - Who is the end-user?
  - Who is the stakeholder?
  - What is our goal?
- Establish problem boundaries
  - Inform interviewer what you're purposely choosing to ignore to solve the problem in the time allotted.
- Talk Out Loud
- Be conversational
  - Am I on the right track?
- Keep goals forefront
- Bring in outside experience tactfully

3 How to develop your product sense

- Create a daily habit
  - Who was the product created for?
  - What's the main problem it was designed to solve?
  - What are the product's end-user benefits?
  - How do the design and marketing convey the product's purpose and benefits?
  - How does the produt tie in with the company's mission and vision?
  - i.e. Snapchat vs. Instagram (communication vs. consumption)
- Analyze the reviews and calibrate
  - Reddit to see unfiltered conversations
  - Apps: The App Store and Google Play
  - Enterprise Products: G2 Crowd and Gartner Special Reports
  - Physical: Amazon reviews

4 How to develop your business sense

- Business Model
  - How does the business monetize? What product levers can be pulled to improve the business' ability to monetize?
- Metrics
  - Which key performance indicators (KPIs) would I measure? What factors/variables influence those metrics?
- Landscape
  - Who are the competitors?
  - Who are the partners?

5 How to develop your domain experience

- I.E. you have an Uber Eats Interview coming up.
  - Learn how Uber makes money and how much of it comes from their transportation products versus delivery business
  - How does Uber Eats fit into Uber's overall strategy?
  - What are the key inputs for Uber's pricing and payout algorithms that determine how much it charges a customer and how much it pays the delivery driver and restaurant?
- If public, look at earnings reports/note business metrics
- If private, look at comparable companies.
- Google search "company name business model"
- Look at Company's Engineering Blog
- Use the product!! Smaller companies will test you.
- Useful in asking interviewer questions at the end. i.e. "I was reading about the food delivery time estimation algorithm on the blog and found X fascinating. I was curious why you used approach Y, and if you ever thought about trying out Z instead?"

6 Metrics to use

- **A**cquisition metrics
  - How are people finding out about my product?
  - new user counts
  - sign-up conversion rates
  - customer acquisition costs (CAC)
- **A**ctivation metrics
  - Do users have a great first experience
  - number of people who make first delivery order
  - number of users who view more than 10 unique posts
- User Engagement
  - Count unique number of users who took a core action
  - DAU (Daily Active Users)
  - WAU (Weekly Active Users)
  - MAU (Monthly Active Users)
- **Retention** metrics
  - Do users come back?
  - Churn - when users join and then leave permanently
  - Maximize retention and minimize churn
  - It's a lot more expensive to find a new customer than retain an existing customer.
  - Monthly retention
  - Monthly churn
- **Referral**
  - Where a user shares a product with others
  - k-factor = of the number of referrals, how many converted. Want a k-factor > 1.
- **Revenue**
  - Lifetime value per customer (LTV) - amount of money a customer brings into business before they churn.
  - Number of paid memberships.
  - Revenue from ad impressions.
  - Initially shouldn't be primary focus. But a byproduct of a nailing product-market-fit (i.e. users are not going click on ads if Facebook is not great at making connections)

7 What makes a metric good or bad

- Data Scientists help Product Managers define apporpriate metrics
- Have the end result in mind before building a product
- **Examples of bad metrics**
  - Vanity Metrics: The number of dating profiles viewed
  - Irrelevant Metrics: Time spent using Facebook Dating. This metric is better for media consumption products like YoutTube and Netflix, not activity-driven dating apps.
  - Impractical Metrics: The number of 3rd dates that occured. More advanced dating apps have a "did you meet?" user prompt or they use NLP on the conversation to determine if they think you met, but this likely works only for a first date, after which the conversation moves off-app.
  - Complicated Metrics: Is the metric easy to explain to stakeholders?
  - Delayed Metrics: Number of marriages that occurred. This is impractical to know but would take a long time to figure out.
- **Examples of good metrics**
  - Meaningful: Tied to business goals
  - Measurable: Simple to reliably track
  - Understandable: Easy for stakeholders to understand.
  - Timely: Can be collected with in a timeframe.
- Important to define guardrail metrics. These are metrics which shouldn't degrade as you're boosting the primary metric (i.e. metric is to reduce the number of harmful posts but don't want to remove everything. Still need to monitor posts made, posts viewed, numbre of likes/comments)

8 Product Metric Question Strategy

- 1. Clarify the product and its purpose
- 2. Explain the product and business goals. Tie it back to the company's mission
- 3. Define Success metrics

9 Product Metric Question Strategy

- 1. Scope Out the Metric Change
  - Did numerator or denominator change?
  - Is the change important?
  - How often does it change?
  - How big of a change is it?
- 2. Hypothesize Contributing factors
  - Accidental Changes
  - Natural Change (seaonality, holidays, ...)
  - Internal Changes (bug fixes, new features, ...)
  - External Changes (Competitors launching new products, pandemic, recession, ...)
- 3. Validate Each factor
- 4. Classify Each factor
  - Root cause: of the change
  - Contributing factor: not root cause but a factor
  - Correlated result: symptom of root cause but not a factor
  - Unrelated factor: unrelated to metric change
  - Example: Why are comments per Instagram posts declining? Cohort Analysis $->$ Affecting Only New Posts $->$ PM reveals new feature added giving users option to turn off comments on post $->$ Remove these posts $->$ No change in comments per post $->$ Root cause discovered!

10 A/B Testing and Experimental Design

- 1. Pick a Metric to Test
- 2. Define Thresholds
  - Set α
  - Set $power = 1 - \beta$
- 3. Pick a sample size and experiment length (i.e. typical to run test for at least two weeks)
- 4. Assign Groups
  - Make sure we randomize groups to avoid confouding variables down the line
- When Not to A/B Test
  - Lack of infrastructure
  - Lack of impact
  - Lack of traffic
  - Lack of conviction
  - Lack of isolation
- Dealing with Non-Normality
  - Bootstrapping
  - Run alternate tests
  - Gathering more data
- Dealing with multiple tests simultaneously. If you run 100 A/B tests, you will have some succeed. Why? How do you solve it?
  - Bonferonni Correction - adjust for the significance level required based on the total number of tests running. $\frac{\alpha}{num\ tests}$
  - FDR - false discovery rate. $\frac{FP}{TP+FP}$. The rate of Type I errors.
  - Dig into the experiment and see if anything could have impacted the primary experiment.
- Dealing with Network Effects - interferance between the control and treatment groups (i.e. Facebook Live)
- Dealing with Novelty Effects - Social Media/PR hypes up a feature and skews metrics
- Nuances: how does A/B test effect the guardrail metrics
- Launch with A/B Test Holdouts - easy to compare live