Wells Fargo Interview Experiences (QAP role)

# **Slot: 1**

# **Procedure**

1. Test: Yes. (Hybrid Mode, EE Department)
2. Interview Mode: Physical (CV Raman Building)

---------------------------------------------------------------------------------------------------------------

# Subhasis Biswas

**Personal View**: Involves much more theoretical depth than generic AI/ML roles. Leans heavily towards traditional statistical ways of financial modeling.

**Status**: Shortlisted through in-person online test (also called hybrid mode). The test venue was EE Department. I was selected for this role. Accepted and froze.

**Interview Description**

## **Round 1:**

Educational Background of the Interviewer (only one member): Physics

Project Specific Discussions: Almost none.

• Check number palindrome using and without using strings

• Lilypads grow at an exponential rate over a pond. If it gets filled in days X, what is the number of days till it gets filled given the current coverage is Y

• Familiarity with Fourier Transforms

• How to use Fourier Transforms for solving PDEs

• Heat-Kernel usage for solving heat equation

• Finite difference methods for ODEs

• If take money and game stops. If take money and the game continues. Expected reward?

• A matrix A given. Perform f(A) without using repeated direct matrix multiplication, rather simpler arithmetic operations. [Idea/Clarification: If A is diagonalizable, . If for some ring R, then . In simpler words, if is a polynomial the equality holds.]

• What is the density function of , where

• Sketch the graph of , with and being of opposite signs. What happens when we add a linear term?

Side discussion: Basic familiarity with random processes. Drift+Diffusion in Geometric Brownian Motion.

Got almost everything right. Whenever I could not be exactly right, I explained intuitively.

## **Round 2:**

Different interviewers (two members), with a long history in this domain. Educational background was MBA (most likely).

• High-level explanation of Internship and MTech projects

• CV looked GenAI inclined. Why more traditional ways? [Reason: My personal background]

• Explain MTech topic a bit more. [Noise is not exactly white, oftentimes an autocorrelated process. Described ways to simulate noise added measurements of a (deterministic) dynamical system with given initial conditions. Also details on AER coordinate system used for satellite-pass observations.]

• How to solve when is large.

• Explain assumptions for logistic regression. Tell MLE setup.

• Cross entropy loss for perfect classifier

• If all features are zero, find out bias if label is 1, in relation to Logistic Function. [Note: Function, not Regression.]

• Expectation of conditioned on a filtration of [Couldn’t solve exactly. But stated the relation to martingales]

• Interviewers affirmed relevance of the tools used in my CV within the domain.

• I asked about good books to get started with. [Recommended Author: Steven E. Shreve]

Personally speaking, I fell short of my own expectations and underperformed. I did not know almost anything at all about financial theory, so couldn’t exactly get familiar with their line of work. But intuitively I understood their role and my expected responsibilities.

## **Round 3: HR**

• Why two Masters’ degrees? Job opportunity in prior degree.

• Why did I not get PPO from Fidelity internship?

• Why not academia/UPSC?

• Preparation mindset/strategy for competitive exam?

• Inquired if I knew the salary structure. Restated the salary structure once again. [I responded that I was aware from the job description on OCCAP portal.]

• Stated that I had to wait till 4-4:30PM for the results.

---------------------------------------------------------------------------------------------------------------

# Tejas Tonde

**Personal View**: Focus more basics of ML

**Interview Description**

## **Round 1:**

Only one member in the panel

Project Specific Discussions: Almost none.

* Take me through your resume.
* Explain logistic regression and linear regression. The assumptions used in these algorithms.
* What is an influential point and an outlier? Effect of outliers in logistic regression? How to overcome the effect of outliers in logistic regression?
* Can we use linear regression in place of logistic regression?
* Given a 4 minutes sand clock and a 7 minutes sand clock, measure 9 minutes.
* Bias -Variance trade off. Over-fitting and under-fitting.
* L1, L2 regularization. What are other regularization techniques?
* Difference between a list and an array in python.
* What are parametric and non-parametric algorithms?
* How to use KNN in linear regression?
* Explain R-square.
* How to measure if binary classification model is performing well?
* Explain recall, precision, F1 score. What are their formulae.
* If a model accuracy is 95%, can we say that the model is performing well?
* How to handle class imbalance? What metric will you focus on in case of cancer prediction (0 or 1)? Explain AUC,ROC.
* Is having more AUC good or bad?
* Explain skewness.
* In a tabular data, if 2 features are highly correlated, what should be done?
* Explain multi-collinearity.
* What are your weaknesses and hobbies? Where do you see yourself after 2 years?

# Rushikesh Pawar

**Personal View**: Emphasis on mathematical and statistical modelling along with traditional machine learning techniques

**Status**: Cleared both technical interviews and gave HR interview as well. I was not selected, likely because candidates with a stronger mathematical background (MSc Math) and internship experience in financial firms were a better fit. 20 students were shortlisted after test for QAP, Around 10-12 students appeared for HR interview and 4 got the offer for QAP role.

**Process**: Physical test > Technical Interview 1 > Technical Interview 2 > HR interview

Test format

|  |  |  |
| --- | --- | --- |
| Section | Number of Questions | Time (min) |
| Quantitative analysis | 14 | 20 |
| Critical Reasoning | 12 | 15 |
| English Comprehension | 12 | 15 |
| Data Interpretation | 8 (2 chart/graph\*4Q) | 15 |
| Coding | 2 | 45 |

Coding questions were very easy to at max medium level. (different questions to different people)

Example questions:

* <https://brainly.in/question/43041224>
* <https://brainly.in/question/53261253>

**Interview Description: QAP role**

## **Round 1: Technical**

**Interviewers:** A person from Wells Fargo's Model Development team.

**Introduction & Background:**

* Started with an introduction and asked about my transition from mechanical engineering to data science.
* I explained that my experience at my previous job made me realize my lack of data science skills, prompting me to pursue this field. The interviewer asked me to describe the problem I encountered and how I would solve it now as I have the skills now. (I wasn't fully prepared, but I explained my approach).

**Internship Project:**

* Discussed my project at Amazon. The interviewer asked detailed questions about my methods, decisions, and motivations, which took up a significant portion of the interview.

**Technical Questions:**

* **Word Embeddings:**
  + What are word embeddings? What are the different types?
  + What is Word2Vec (since I mentioned implementing the Skip-gram model in my CV)? Skip-gram vs CBOW?
  + What are the drawbacks of Word2Vec (static embeddings), and how do newer models address these issues?
  + Does GloVe solve the problems of Skip-gram? (No)
  + How does BERT address the limitations of earlier models?

(I gave an example of “bank of India is on the bank of the river”, bank word has a different meaning in both instances, but word2vec will assign only one embedding to both “bank” tokens, while BERT will give two different embeddings)

* **Bias-Variance Tradeoff:**
* What is Bias-variance tradeoff?
* What are bagging and boosting, and how do they differ?

**Other**:

Which team would you like to join at Wells Fargo? Do you know what they do? ( I explained whatever I knew)

**Q&A:**

I asked about the projects he was working on, as I was curious about his involvement with large language models (LLMs), and we had an interesting discussion.

## **Round 2: Technical**

**Interviewers:** Two members from the Model Validation team.

A high-level introduction to the internship project

One interviewer asked, "Wells Fargo is a bank, so why do you want to join?" (This was a tricky question). I responded that financial institutions require data-driven insights and, because the stakes are high, the machine learning solutions need to be sophisticated. He appreciated the response and acknowledged it as a tricky question.

He then asked which area I am more inclined toward—system/software or mathematical/statistical/ML modelling. I mentioned that, coming from a mechanical background, I preferred the latter.

Asked me to explain what a random process is. My explanation impressed them.

**Linear Regression:**

* What are the assumptions of linear regression?
* What is heteroscedasticity? How do you detect it? (I struggled with detection, so he explained it to me).
* What is multicollinearity? Why is it a problem, how do you detect it, and how do you address it?

**Logistic Regression:**

* What is logistic regression?
* What is the equation of the sigmoid function?
* Why is logistic regression considered a linear model despite involving a non-linear function?
* How do you train the logistic regression model?
* What is likelihood? What is MLE? ( I explained MLE can be seen as minimization of KL divergence between two distributions after using Law of Large numbers to approximate the expectation.

**Classification Metrics:**

* How do you evaluate classification performance? Discussed precision, recall, F1 score, and accuracy (and when each should be used).
* What are ROC and AUC, and why are they important?

**Q&A:**

* I asked several questions about their work, and they also asked for my thoughts on those topics, leading to a good discussion.
* Some of the questions I asked were, why is validation required for classification and regression models? How do you decide if model performance is degraded and it should be retrained?

## **Round 3: HR**

* Asked me about the entrance exams required for admission into the CDS program at IISc.
* Inquired about my responsibilities as a teaching assistant for the NLA course and was surprised to learn that master’s and PhD students are also enrolled in the course.
* Asked me if I have any offers, and why Amazon didn’t offer me a PPO
* Asked if I knew the team I was being considered for and explained the CTC structure (though I was already familiar with it).
* Informed me that offers would be made based on a ranking system.

**Q&A:**

* I asked a few final questions about the role, work culture and location.

---------------------------------------------------------------------------------------------------------------