#Tech Question

1) What are the major components of this system needs?

- The major components for this system would be to create a user id, Modify the user id and stats, Deleting a user data from the database. Along with these there should be a way to retrieve the data with ease. The communication with the database should be proper in case of issues like SQL Injections.

2) What Tech stack you might use for each of these components?

- In case for real time deployment we can use a main database where the data will be stored like MySQL, PostgreSQL, Mongo dB and have a in memory database for the players who are online so that their real time data can be updated with high speed and lesser transaction needs to be done to main database.

3). What are some pitfalls and common issues you might encounter?

- The major issue for this system would b how to defend the system from SQL Injections and SQL server crash. Other important pitfalls for this system would be the huge dataset. In case we have millions of users using this game then the common database won't be able to handle real time expensive queries. For example, we have million users, and we want to check for the leaderboard then checking each user stats to determine 'order by' would take too much time. For this we could use Apache Spark MapReduce which has much better performance over regular database.

4). If there are any open questions or unknowns about your design, you should highlight them in your response.

- In this design the system will work flawlessly if we have small amount of data. If there is huge data, the system would still work but would be much slower compared to MapReduce. I have designed it to handle exceptions and system crashes as well as handling existing user id issues. Also, in this design instead of using MySQL-connector which lets developers write queries directly in the application but also increases the erroneous characters being allowed for eg. This library would allow ';' or column name to be username which should not be allowed in ideal environments. This library would be easy target for SQL Injection. Therefore, I used ORM **SQLALchemy** which would handle above scenarios.

5). What's the most exciting technical project you've worked on and why was it exciting?

- One of the most exciting project I've worked on would be my undergrad final year project Smart Irrigation System Link:- https://smartirrigationsystem.herokuapp.com Email :- sample@sample.com pass :- Sample@123.. In this project me and my team dealt with software and hardware problems without prior experience in hardware before. We got out of our comfort zone to also learn about micro-controllers and micro-processors working principles and coding required for this hardware. Along with this in software we created a web application as well as android application. The web app can provide Realtime monitoring and remote access to the hardware controllers. In this project we learnt about how to deal with combining software and hardware, how to communicate with each component. In android application there are all the features of web app along with three languages to user understanding (English, Hindi, Gujarati). For this project we used spring boot and all market demands were considered for user satisfaction.

6). What motivates you to continue working in technology and/or software engineering?

- The major thing which motivates me in software development is the logic development and the creativity required for different projects. I like exploring different technologies learning and experimenting with it in projects. In software Engineering we get different challenges in all this projects and I like solving these problems. In this current take home assignment, I learnt a lot about SQL Injection and handling server issues.

7). What do you hope to get out of this internship?

- In this internship I want to learn about the technologies and Industries standards for problem solving.