**1. Write an SQL query to find the user “jimbob”**

SELECT \* FROM users WHERE username = "jimbob";

**2. Write an SQL query to find all of the posts created by user “the\_gary”**

SELECT posts.\* FROM posts, users WHERE posts.created\_by\_id = users.id AND users.username = "the\_gary";

**3. Write an SQL query to find all posts by “the\_gary”, with a status of ‘published’, created this year.**

SELECT posts.\* FROM posts, users WHERE posts.created\_by\_id = users.id AND users.username = "the\_gary" AND posts.post\_status = "published" AND YEAR(posts.date\_created) = YEAR(CURDATE());

**4. Imagine the user's table has 20000 entries; how would you approach indexing it?**

I would create an index using the username field with the query:

CREATE INDEX users\_username\_idx ON users (username);

I decided to use the username field as it contains data that is unique to every user - two users can't have the same username. This means that the username field will be frequently used to find users instead of the first or last name for example, which will have repeating values. Finally, I decided to only set up one index as each index created takes up extra space and too many can massively increase the database size. Furthermore, adding indexes slows down the time it takes to modify a table as all the indexes will need to be updated every time the table is changed. The user's table will often be changed as new users are added so, therefore, creating too many indexes could negatively impact the database overall as the time to add new users is increased.

**5. Why is it not recommended to index small tables of data?**

It's not recommended to index small tables as it already takes a short amount of time to search through the data. This could mean that a created index is never used, as the time taken to search is the same or longer than a regular table scan. The created index would also need to be maintained so any time the table is updated the index will need to be updated as well. This slows down the time it takes to update the table. So, a created index could not be used due it to not having a time benefit but also increase the time it takes to modify the table. Therefore, having a negative overall impact.