

Support Engineer Take-home Assessment

Important: While working on this assessment, you can consult external sources, but you must cite them. We are looking for answers in your own words.

1. Write a Ruby or Bash script that will print usernames of all users on a Linux system together with their home directories. Here's some example output:

```
gitlab:/home/gitlab
nobody:/nonexistent
.
.
```

Each line is a concatenation of a username, the colon character (:), and the home directory path for that username. Your script should output such a line for each user on the system.

Next, write a second script that:

- Takes the full output of your first script and converts it to an MD5 hash.
- On its first run stores the MD5 checksum into the **/var/log/current_users** file.
- On subsequent runs, if the MD5 checksum changes, the script should add a line in the **/var/log/user_changes** file with the message, **DATE TIME changes occurred**, replacing **DATE** and **TIME** with appropriate values, and replaces the old MD5 checksum in **/var/log/current_users** file with the new MD5 checksum.

Finally, write a crontab entry that runs these scripts hourly.

Provide both scripts and the crontab entry for the answer to be complete.

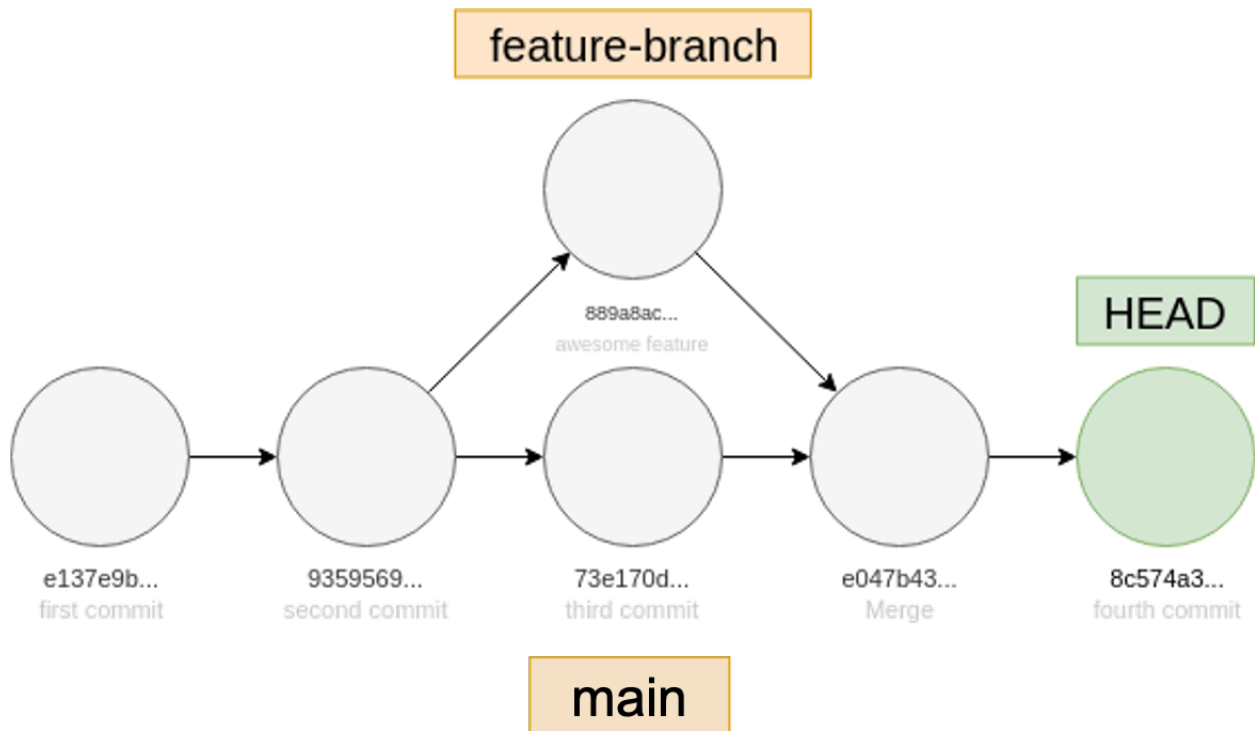
2. A user is complaining that it's taking a long time to load a page on our web application. In your own words, write down and discuss the possible cause(s) of the slowness. Also, describe how you would begin to troubleshoot this issue.

Keep the following information about the environment in mind:

- The web application is written in a modern MVC web framework.
- Application data is stored in a relational database.
- All components (web application, web server, database) are running on a single Linux box with 8GB RAM, 2 CPU cores, and SSD storage with ample free space.
- You have root access to this Linux box.

We are interested in learning about your experience with modern web applications, and your ability to reason about system design and architectural trade-offs. There are no right and wrong answers to this question. Feel free to write as much or as little as you feel is necessary.

3. Study the Git commit graph shown below. What sequence of Git commands could have resulted in this commit graph?



4. GitLab has hired you to write a Git tutorial for beginners on: **Using Git to implement a new feature/change without affecting the main branch**

In your own words, write a tutorial/blog explaining things in a beginner-friendly way. Make sure to address both the "why" and "how" for each Git command you use. Assume the audience are readers of a well-known blog.

5. What is a technical book/blog you read recently that you enjoyed? Please include a brief review of what you especially liked or didn't like about it.