

Technical Task

Machine Learning Engineer

Background

The interview following your completion of this task will take approximately one hour and will be split into three sections.

1. **Presentation (20–30 mins):** You will present back your results and findings from this task.
2. **Q&A Session:** We will ask you questions about your presentation and the approach you took in the task.
3. **Technical Questions:** We will ask you additional technical questions that are not necessarily focussed on the task.

This task requires you to develop both code and a written document, allowing you to showcase your domain knowledge, coding skills, and problem-solving abilities efficiently. Please allocate no more than 3 hours to this task; a detailed, polished product is not expected.

Your submission should include:

- **Code:** One or more files containing the code for your prototype. Python is preferred, but not mandated.
- **Documentation:** A **readme.md** file in Markdown format, succinctly outlining your main points and arguments. Include any diagrams or charts you find useful.

Please submit your submission to a private GitHub (or equivalent) repository and share access with us when requested.

You'll have a chance to expand on your submission during the interview presentation. If you have any questions, please ask before the interview.

Task

You will be working with data from an online news platform. You will need to prototype a content recommendation model and outline a deployment strategy for productionisation of the model in the cloud.

Coding Component

Develop a prototype of a content recommendation model that provides personalised article recommendations to users. Use the data provided to build your prototype. If additional data sources would facilitate a better choice of model, then tell us the details, but please build your prototype model around the data you have available. The data is limited in size, so do not aim for a highly optimised model - opt instead for a model choice you can justify for the task at hand, that would scale to production workloads. Indicate the methods you would use to optimise the model given a larger dataset.

Data Provided:

- **article_metadata.csv** - Information on articles available on the platform.
- **clicks.zip** - Contains 100 files of user interactions, including some metadata. Each file is 1 hour of data.
- **article_embeddings.pickle** - A numpy array of 250-dimensional vector embeddings for every article. Use this as a proxy for article content and meaning.

Written Component

Your document should describe a strategy for deploying your recommendation model in a production cloud environment. This should include:

- **Cloud Services and Resources:** Outline any cloud services needed for deployment, including any considerations for scalability and reliability. Base your service choices on any cloud provider you are familiar with.
- **Monitoring and Performance Metrics:** Discuss how the model's performance will be monitored in production, including which metrics will be tracked and how alerts will be handled.
- **CI/CD Pipeline:** Propose a continuous integration and continuous deployment pipeline that ensures updates to your model are tested and deployed efficiently.
- **Security Considerations:** Address any potential security issues and compliance with data protection regulations.