Challenge 1 - Local Kafka :: CodeSoc HPC

Challenge brief

For this challenge, you will split into teams of three.

In modern-day software engineering, there is an increasing need for people that are able to produce reliable products fast. One product commonly used throughout the industry is Kafka – a message-queue system designed to reliably pass messages consistently between some producer(s) and consumer(s). Typically, this is a system deployed at scale, spanning hundreds of cores and possibly terabytes of RAM.

This challenge requires you to set up Kafka using Kubernetes, as well as run producers and consumers. I will provide producers, compiled for a variety of architectures. You are responsible for running these producers on different Kubernetes pods, via Docker hopefully, running the Kafka instance, and building out consumers.

The payload, in JSON format, includes:

```json
{
   "ticker": string (either STK_ONE or STK_TWO),
   "timestamp": integer,
   "price": integer
}
```

The payload, in Protobuf, is:

```pb
syntax = "proto3";

package stockfeed;

message StockUpdate {
  int64 timestamp = 1;
  int32 price = 3;
}
```

You can choose which to use for your application. The documentation is available in the README. Points are awarded for faster consumers.

The goal after setting this up, is to produce Grafana visualisations of the data, as well as export relevant Kafka metrics and visualize those too.

In your final submission, please include scripts used, any automations used, design decisions, struggles encountered, and whatever else you think is relevant

Pointers for help

- Informally, you should try your best to work as a team. This challenge doesn't lend itself to being easy to collaborate on, but it is your job to find a way.
- Use documentation, GPT, any resources you can find (even talking to people online). Be resourceful.

Mark Scheme

Criteria	Total Score
Making the Kubernetes cluster	10
Correctly setting up Kafka on the k8s instance	20
Correctly setting up the producers to write to Kafka on k8s	10
Correctly building data consumers	20
Setting up data consumers on k8s	10
Managing to get data exports	10
Grafana visualisations	20