1. Describe the following:

- Sink and Source connectors.

- A source connection is a software component that gathers data from a system. Databases, streaming tables, and message brokers are all examples of source systems. A source connection might also gather metrics from application servers and store them in Kafka topics, allowing for low-latency stream processing.

  A sink connection sends data from Kafka topics to other systems, which might be indexes like Elasticsearch, batch systems like Hadoop, or databases of any sort.

- The applications/advantages of using Kafka Connectors with data storage.

- Data from external systems may be imported into Kafka topics, and data from Kafka topics can be exported to external systems, which is one of the advantages of Kafka connectors.

- How do Kafka connectors maintain availability?

- Kafka connections keep the system available by allowing it to be deployed as a solo application or as a distributed application.

- List the popular Kafka converters for values and the properties/advantages of each.

- The popular Kafka converters for values include: ProtobufConvertor, JsonSchemaConverter, and AvroConverter.

  Advantages of the ProtobufConvertor include:

  - Compact data storage
  - Available for many different programming languages
  - Quick parsing
  - Automatically-generated classes help optimize functionality

  Advantages of the JsonSchemaConverter Include:

  - The structure and validation limitations of JSON documents are described using JSON Schema.

  Advantages of the AvroConverter include:

  - Helps convert data in and out of Avro format for Kafka Connect.

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2. Search the internet to answer the following question:

- What's a Key-Value (KV) database?

  A key-value database is a nonrelational database that stores data using a simple key-value mechanism. Data is stored in a key-value database as a collection of key-value pairs, with a key serving as a unique identifier. Both keys and values can be any type of object, from basic to sophisticated compound objects.

- What are KV databases' advantages and disadvantages?
  - Advantages Include:
    - Simplicity
    - Reliability
    - Speed
    - Convenience
  - Disadvantages include:
    - Only works with data that has a single key and value. Multiple values must be stored, which necessitates the use of a parser.

    - Lookup isn't optimal. Lookup necessitates either a full scan of the collection or the creation of individual index values.

- List some popular KV databases.

  A few Key-value databases are:

  - Amazon DynamoDB
  - Oracle NoSQL
  - Riak KV
  - Voldemort

3. List some possible applications that can be implemented by using the uploaded dataset: Given that this dataset is able to simulate real sensors and save states in a database there are a few real-world applications that you can utilize with this.

- Real-time shipments of products
- Land mapping for agriculture
- Logistics for businesses and economics
- Website activity tracking

- Monitoring star clusters and planet coordinates for astronomy
- Real-time data streaming for large presentations, google meets, or screen sharing