# Exercise 1

1. What is the difference between DSMS and DBMS?

| Data Stream Management System(DSMS) | Data Base Management System(DBMS) |
|---|---|
| • Volatile data streams(assumed infinite) are being processed<br>• Sequential access<br>• Bounded main memory<br>• Queries are continuous<br>• Variable data arrival and data characteristics<br>• Potentially extremely high update rate | • Persistent data(relations) is being processed<br>• Random access<br>• "Unbounded" disk store<br>• One-time Queries<br>• Plannable query processing<br>• Relatively low update rate |

2. What are the steps that a query goes through before its deployment?

   - Creation of the query by the application.
   - Translation of the query into a logical query plan.
   - Optimization of the query plan.
   - Transformation of the logical query plan into a physical one.
   - Deployment and execution of the Physical query plan.

3. How are queries processed in DSMS different to those in DBMS?

| DSMS Queries | DBMS Queries |
|---|---|
| • Waits for future incoming tuples<br>• Evaluated continuously as new tuples arrive<br>• Queries are persistent and the query answer is approximate. | • Evaluated once over the data stored in the past in the database<br>• Queries are transient and the query answer is exact |

4. Provide three use cases, where DSMS can be used; describes the data processed and the queries performed on them in each use case.

- Traffic application scenario:

  DSMS can be used for vehicles communication. For example, a vehicle can send a warning message to the other vehicles behind it when the vehicle brakes very hard.
  These messages may contain general information about the current state of the vehicle, like speed, the location or the acceleration.

- Web logs and click-stream:
  Web log analysis is a simple type of processes that parses a log file from the web server, and indicates about who, when, and how a web server is visited.
  DSMS is used to manage this data so as to improve the websites and to manage the traffic over that web server. Data like Page views per visit, Clicks per hour or per session or Busy hours of the day can be obtained.

- Security applications:
  Multilevel Secure DSMS can be used in sensitive applications such as battlefield monitoring. This can be used to detect the illegal data flow or to process the continuous queries.