Project 1: Database Management System

- Design Document
- DB Engine
- Lexical Parser
- DB Engine and Lexical Parser Integration
- DB Application and integration
Project 1 – Part 1: Design Document

• **State the purpose of your project/subsystem**
  • What is the objective?

• **Define the high level entities in your design**
  • High level description and diagram illustrating the project.

• **For each entity in the previous section, define the low level design**
  • Usage: entity interfaces, benefits, risks....
  • Configuration: how to configure or initialize each entity
  • Model: What are the attributes, functions, or methods in each entity
  • Interaction: how different objects or entities interact and work together

• **Benefits, assumptions, risks/issues**
  • List all the foreseen issues, challenges, and risks of this project
An **entity-relationship diagram (ERD)** is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within that system. An ERD is a data modelling technique that can help define business processes and can be used as the foundation for a relational database.
Project 1

In BBS Application:
- Design Table
- Generate content
- Update content

... Store the relations/tables into text files.
Do not care what relation/tables look like

DBMS
- Parser
- DB Engine

BBS Store and Retrieve data (tables) from DBMS

Article
- ArticleId
- Creator
- Boards
- Time
- Content

Year | Jan.   | Feb.   | March  | ...
----|--------|--------|--------|-------
1958| -99.99 | -99.99 | 315.71 | ...  
1959| 315.56 | 316.47 | 316.65 | ...  
1960| 316.43 | 316.97 | 317.58 | ...  
1961| 316.89 | 317.7  | 318.54 | ...  
1962| 317.94 | 318.56 | 319.69 | ...  
1963| 318.74 | 319.08 | 319.86 | ...  
...  | ...    | ...    | ...    | ...

Phase 1

Phase 2
Phase 1 DBMS

A simplified example:
Phase 1 DB Engine

A simplified example:

- **Relation Operations**
  - Select()
  - Project()
  - Rename()
  - ...

- **Attribute**
  - Name
  - Type
  - print()
  - ...

- **Tuple**
  - Vector<Attr>
  - Get()
  - set()
  - ...

- **DB Command**
  - Open()
  - Close()
  - Save()
  - ...

- **Relation**
  - Vector<Tuple>
  - Get()
  - Set()
  - ...

- **DB**
  - Relation
  - print()
  - ....
Phase 1 Recursive-Descent Parser

A simplified example:
Phase 2 BBS Architecture

A simplified example:

- **Account Manager**
  - User
  - Group

- **Menu Mng.**
  - Create()
  - Edit()
  - Delete()

- **Msg. Mng.**
  - sendMsg()
  - readMsg()
  - listMsg()

- **Log. Mng.**
  - addLog()
  - listLog()
  - ... (omitted)

- **Board Mng.**
  - Create()
  - Delete()

- **DBMS**
Phase 2 BBS: Entity Relation Diagram

A simplified example:
References:

• searchcrm.techtarget.com/definition/entity-relationship-diagram