

Since 1992, this list has been compiled, classified and updated by Dr. Junping Sun. This list has been extensively distributed to database courses such as CISC 660 Database Management Systems (1992, 1993, 1994, 1995, 1996, 1997 Spring and Summer, 1998 Spring), DCIS 850 Project in Database Management Systems (1994), CISD 850 Project in Database Management Systems (1995), DISS 850 Project in Applied Database Management Systems (1995, 1997), etc. This list is the same as the list given in the recent course syllabus for DISS 850 (Summer 1997, Fall 1997). Anyone is free to use it as reference, but the authorship of this list should be protected.

Suggested Topics for Written Project Report

Traditional Databases:

- Buffer Management
- Concurrency Control
- Crash Recovery
- Data Consistency, Integrity, and Security
- Data Models and Data Modeling
- File Structures and Access Methods
- Functional Dependencies and Normalization
- Index Structures
- Integrity Conditions or Constraints
- Lossy Join and Dangling Data Tuples
- Null Values, Incomplete and Missing Information
- Query Languages
- Query Optimization (Techniques or Algorithms)
- Security and Authorizations
- Storage Managers
- Transaction Processing and Management

Data Models

- Hierarchical Database Systems
- Network Database Systems
- Relational Database Systems
- Object-Oriented Database Systems

Relational Database Systems:

- CA-INGRES
- System R
- System R*
- DB2
- INFORMIX
- ORACLE
- SYBASE
- SQL/DS
- SQL Server

Database Researches:

- Active Databases
- Database Machine and Database Computers

- Deductive and Logic Databases
- Deductive and Object-Oriented Databases
- Distributed Databases
- Distributed Object-Oriented Databases
- Extensible Databases
- Federated Databases or Heterogeneous Databases
- Object-Oriented Databases
- Object-Relational Databases
- Multidatabase Systems
- Parallel Databases
- High Performance Databases
- Temporal Databases
- Trusted Database Management Systems

Database Applications:

- Audio/Video Database Systems
- CAD/CAE/CAM/CAP/CASE/CIM Databases
- Client/Server Database Systems
- Engineering Databases
- Genomic Databases
- Geographical Databases and Information Systems
- Hypertext/Hypermedia Databases (Object)
- Historical Databases
- Image, Pictorial and Visual Databases
- Mobile Data Management and Communication
- Multidimensional Database Systems
- Multimedia Databases and Information Systems
- Real-Time Database Systems
- Scientific Databases
- Software Engineering Databases
- Spatial Databases
- Spatiotemporal Databases
- Statistical Database

Data Models and Database Modeling:

- Entity-Relationship Model
- Extended ER Model
- Enhanced ER Model
- Complex Data Model
- Extended Relational Data Model
- Functional Data Model
- Non First Normal Form Data Model (NF²)
- Object-Oriented Data Model
- Object-Relational Data Model
- Semantic Data Model
- Structural Data Model

- Deductive Database Model
- Fuzzy Database Model
- Probabilistic Database Model
- Rough Set Database Model

Access Methods:

Static/Dynamic/Extendible/Linear Hashing/Multidimensional Hashing
Internal/External Hashing
Single Level/Multi-Level Index
Single Dimensional/Multi-Dimensional Index
B-Tree, B+-Tree, B*-Tree
Buddy-Tree
Grid-Files
K-D-Tree, K-D-B-Tree, HB-Tree
LSD-Tree
R-Tree/R+-Tree/R*-Tree/R**-Tree

Next Generation Databases:

Gemstone
HyBase
IDB Object Database
Itasca ODBMS
Jasmine
NeoAccess
O2 ODMG Database System
Objectivity/DB
Object Store
ONTOS
Orion
Persistence Framework
Phyla
POET
Polyhedra
Raima Object Manager
Statice
UniSQL/M Multidatabase System
UniSQL/X Database Management System
VERSANT ODBMS

Others:

Advanced Database Modeling (EER Models)
Algorithms for Database Management Systems
Authorization in Object-Oriented Database Systems
Case Tools for Database Design (Comparisons on Pros and Cons)
Client/Server SQL
Complex and Composite Objects
Data Allocation in Distributed Database Systems
Data Partition, Load Balance, and Scalability in Parallel Database Systems
Data Dictionary/ Data Repository
Data Visualization in Database Systems
Data Warehouse Architecture and Design
Data Warehouse Management
Data Compression in Database and Multimedia Systems
Database Design Methodologies

Database Design Automation and Database Design Tools
Database Performance Tuning and Benchmark
Database Reengineering and Reverse Engineering
Database Security
Database System Portability
Data Warehouse Tools
Denotational Semantic Database Languages
Document/Image Processing and Management
Distributed Objects
Electronic Commerce and Electronic Data Interchange (EC/EDI)
Functional Data Model
Graphical and Intelligent Database Interfaces
Heterogeneous Systems and Interoperability
High Performance Memory and Storage Systems for Zillion-Byte Databases
Incomplete, Imprecise or Uncertain Information
Information Engineering
Knowledge and Expert Database Systems Applications
Knowledge Representation in Artificial Intelligence and its Connection with Databases
Knowledge Discovery and Data Mining in Database Systems
Logic Programming and Database Coupling
Long Duration and Cooperative Transactions
Object-Oriented Paradigm Standards
Object Storage
ODBC, HDBC, JDBC and API (Open Database Connectivity)
OMG/COBRA
ODMG Standards
OLE (Object Linking and Embedding)
OLAP (On Line Analytic Processing)
OLTP (On Line Transaction Processing)
Multidimensional Databases and Queries
Persistent Object Management
Parallel Query Processing and Algorithms
Query Language in Object-Oriented Databases
Query Optimization in Object-Oriented Databases
Query Processing and Algorithms
RAID for Database Systems (Redundant and Independent Disk)
Relational Object Shells (PENGUIN)
Referential Integrity Constraints and Applications
Rules and Triggers
Speed-Up and Scale-Up of Data Processing
Schema Evolution
Semantic Data Models and Modeling
Semantic Modeling of Hypermedia/Multimedia Information Systems
Semantic Query Optimization
Single and Multidimensional Index Schema
SQL Standards and Standardization
Synchronization of Operating Systems and Multimedia Databases
The World Wide Web (Database Issues in Internet and Intranet)
Transaction Processing Benchmark
Version Management in Temporal Databases and Object-Oriented Databases

