



TDDD43 Advanced Data Models and Databases

<http://www.ida.liu.se/~TDDD43>

6hp

DF22300 Advanced Data Models and Databases

<http://www.ida.liu.se/~patla/courses/AdvDB/>

6hp



Teachers

- Examiner: Patrick Lambrix
- Lectures: Patrick Lambrix, Olaf Hartig
- Labs: Huanyu Li
- Director of studies: Patrick Lambrix



Course literature

- Articles (on web/handout)
- Lab descriptions (on web)



Databases / Data sources

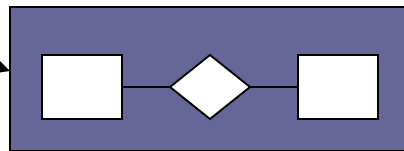
- One (of several) ways to store data in electronic format
- Used in everyday life: bank, hotel reservations, library search, shopping

Databases

- Database management system (DBMS): a collection of programs to create and maintain a database
- Database system = database + DBMS

Databases / Data sources

Information

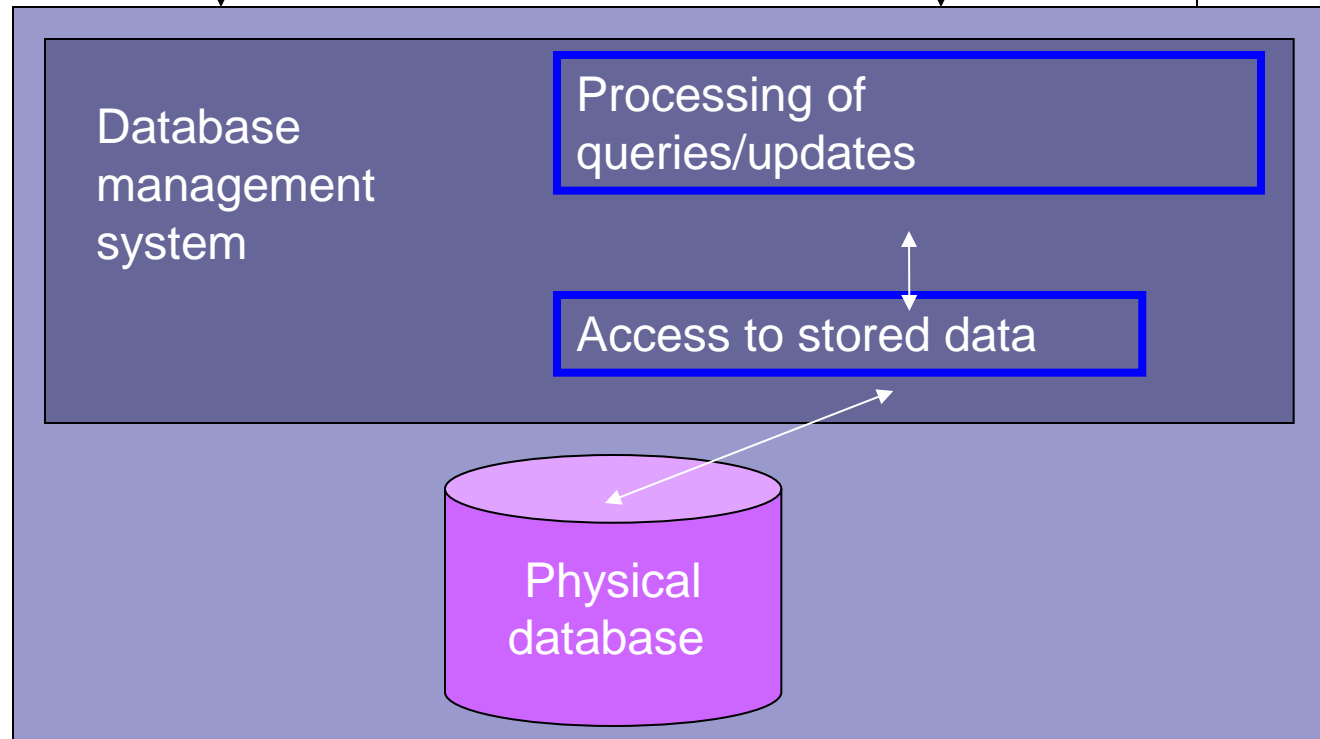


Model

Queries

Answer

Database system





What information is stored?


- Model the information
 - Entity-Relationship model (ER)
 - Unified Modeling Language (UML)

What information is stored? - ER

- entities and attributes
- entity types
- key attributes
- relationships
- cardinality constraints

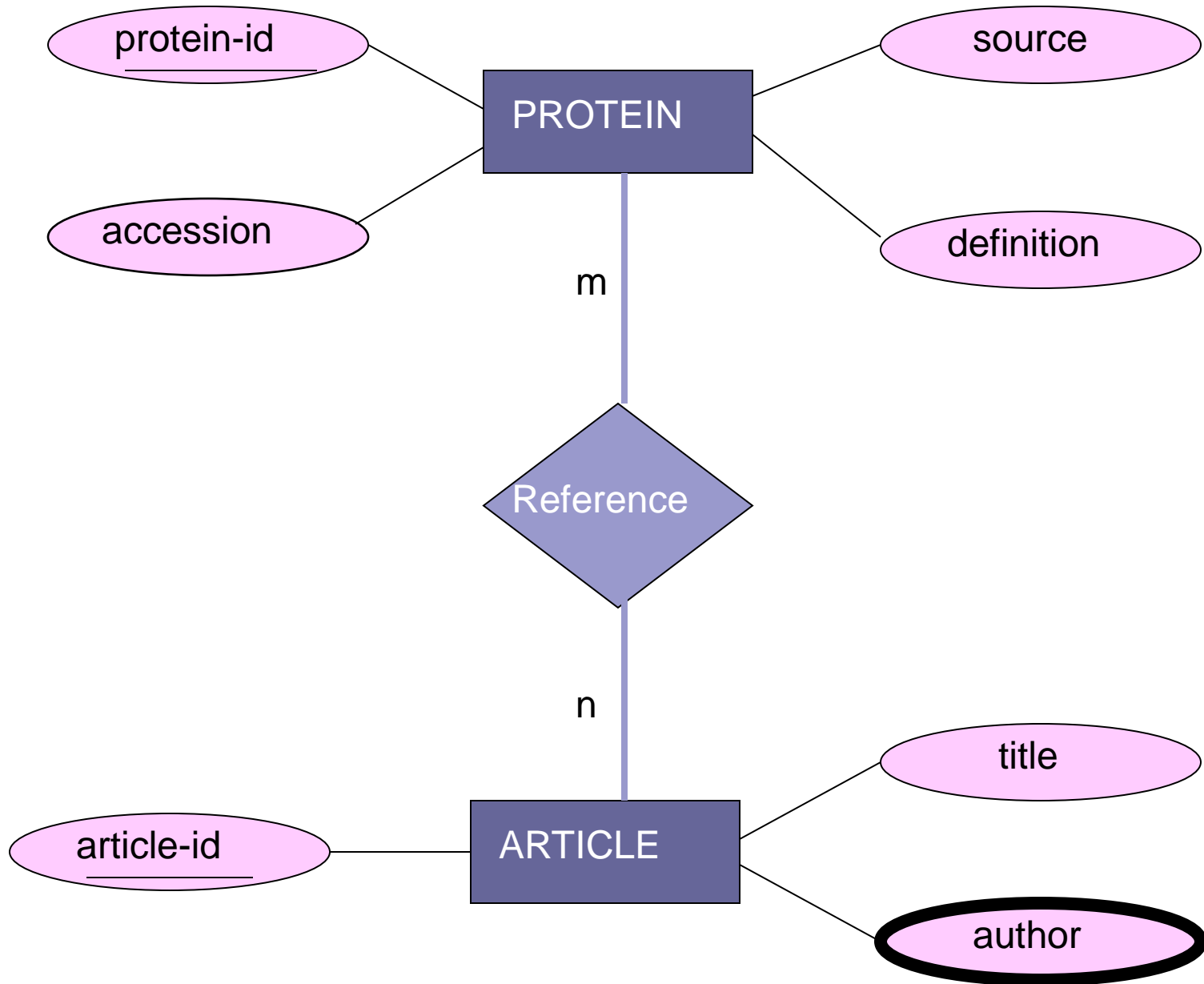
- EER: sub-types

1 tgctacccgc gcccgggctt ctggggtgtt cccaaccac ggcccagccc tgccacaccc
61 cccgccccg gcctccgag ctggcatgg gcgcggggt gctcgtctg ggcgctccg
121 agcccgtaa cctgtcgtc gccgcaccgc tccccgacgg cgcggccacc ggcgcgggc
181 tgctggtgcc cgcgtcgcc cccgcctcgt tgctgcctcc cgccagcgaa agccccgagc
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1561 gggaacgagg agatctgtgt ttacttaaga ccgatagcag gtgaactcga agcccacaat
1621 cctcgtctga atcatccgag gcaaagagaa aagccacgga ccgtgcaca aaaaggaaa
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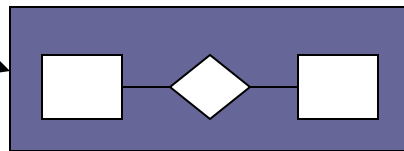
DEFINITION Homo sapiens adrenergic, beta-1-, receptor
ACCESSION NM_000684
SOURCE ORGANISM human
REFERENCE 1
AUTHORS Frielle, Collins, Daniel, Caron, Lefkowitz,
Kobilka
TITLE Cloning of the cDNA for the human
beta 1-adrenergic receptor
REFERENCE 2
AUTHORS Frielle, Kobilka, Lefkowitz, Caron
TITLE Human beta 1- and beta 2-adrenergic
receptors: structurally and functionally
related receptors derived from distinct
genes

Entity-relationship



Databases / Data sources

Information

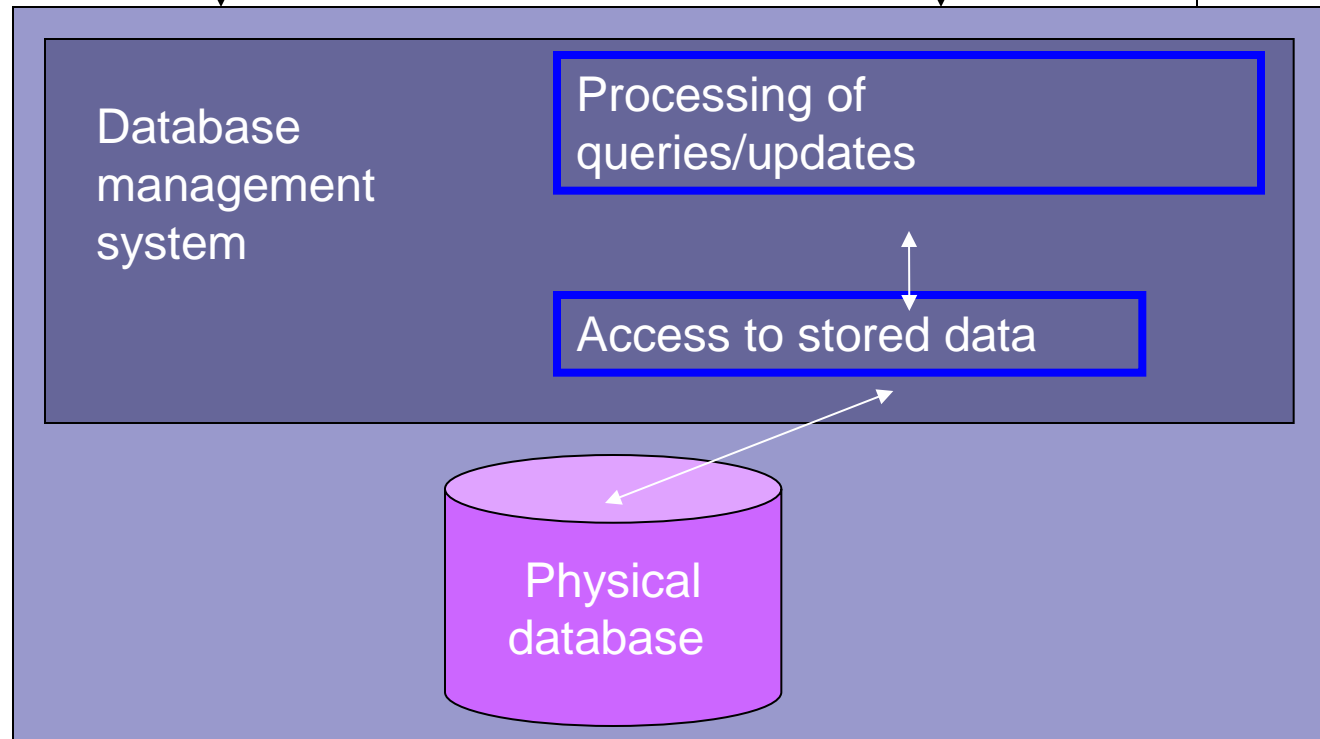


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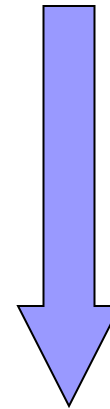
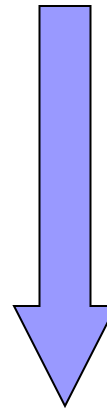
How is the information stored?
(high level)

How is the information accessed?
(user level)

- Text (IR)
- Semi-structured data
- Data models (DB)
- Rules + Facts (KB)

structure

precision



Course overview

- Information Retrieval (lectures)
- Semi-structured data, XML and RDF (lectures + labs)
- NoSQL databases (lectures + lab)
- Semantic Web, Ontologies, OWL (lectures + lab/R)
- Data integration (lectures + lab/R)

Info

- Results reported in connection to exams
- Info about handing in labs on web; strong recommendation to hand in as soon as possible
- Sign up for labs via web
(TDDD43 in pairs; PhD individual)
- Apply for special account for NoSQL lab (NSC)

Examination

- TDDD43

- Written exam

- Labs

- PhD students

- Take home exam

- Labs



Changes w.r.t. last year

- Minor clarifications in labs
- Possibly participation in research study instead of ontology and ontology alignment labs

My own interest and research

- Modeling of data
 - Ontologies (for Life sciences, animal health, materials design, crime scene investigation, sports analytics)
- Ontology engineering
 - Ontology alignment
(Winner Anatomy track OAEI 2008 / Organizer OAEI tracks since 2013)
 - Ontology debugging and completion
(Founder and organizer WoDOOM/CoDeS 2012-2016)
- Former work: knowledge representation, data integration, knowledge-based information retrieval, object-centered databases
- <http://www.ida.liu.se/~patla00/research.shtml>