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/4.5hp

Teachers

- Examiner: Patrick Lambrix
- Lectures: Patrick Lambrix, Olaf Hartig, Valentina Ivanova
- Labs: Valentina Ivanova

Course literature

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

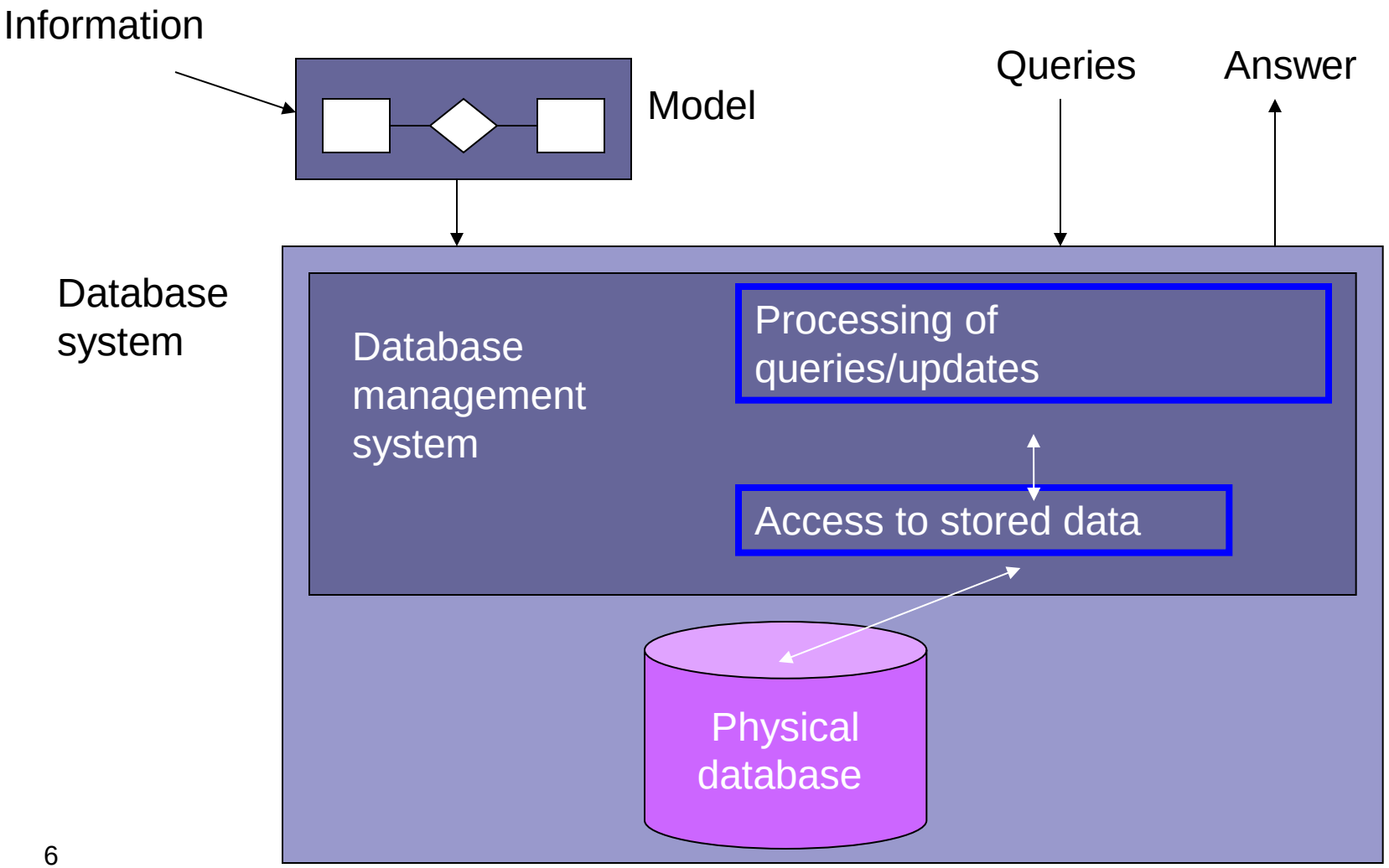
Databases / Data sources

- 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



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

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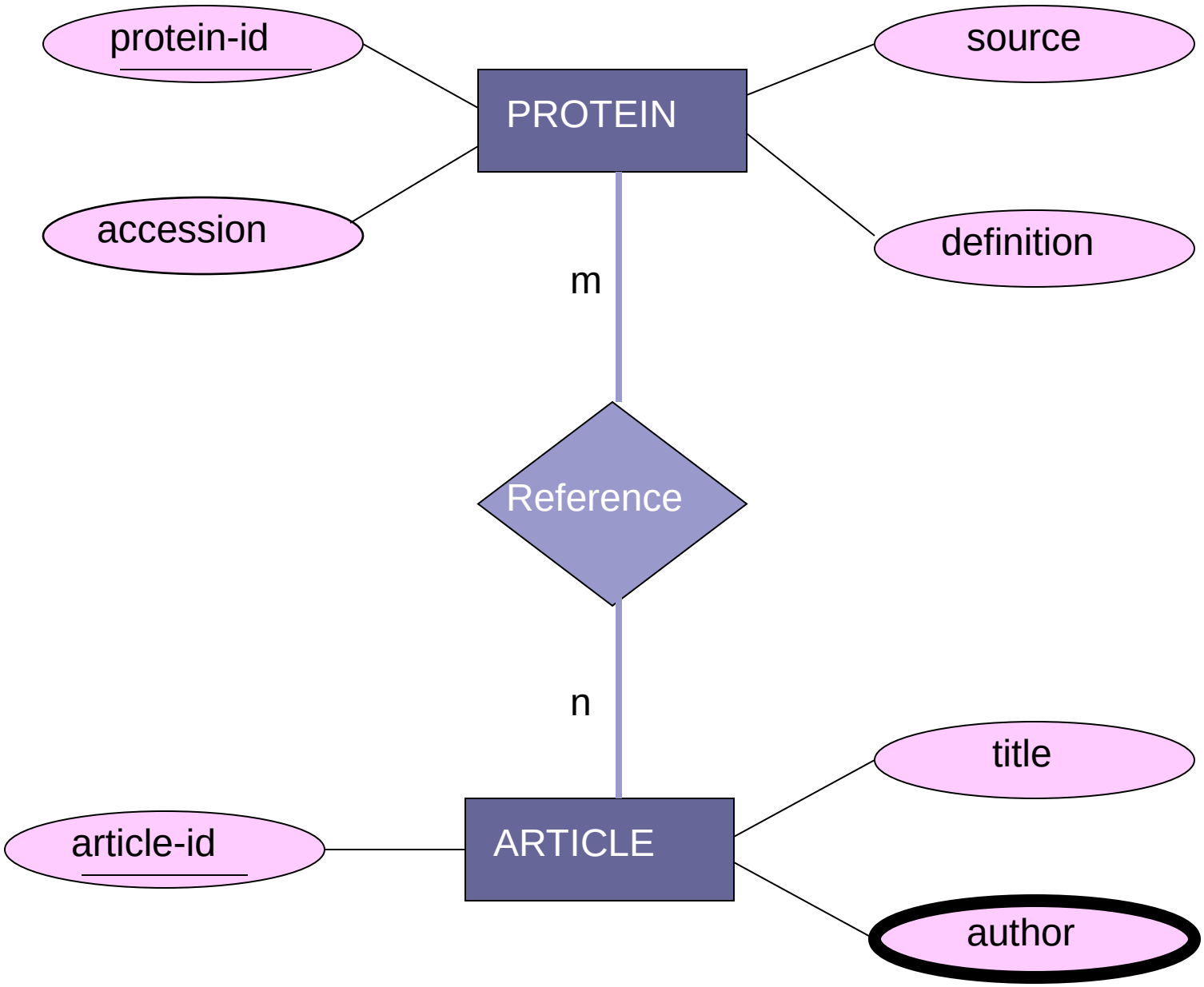
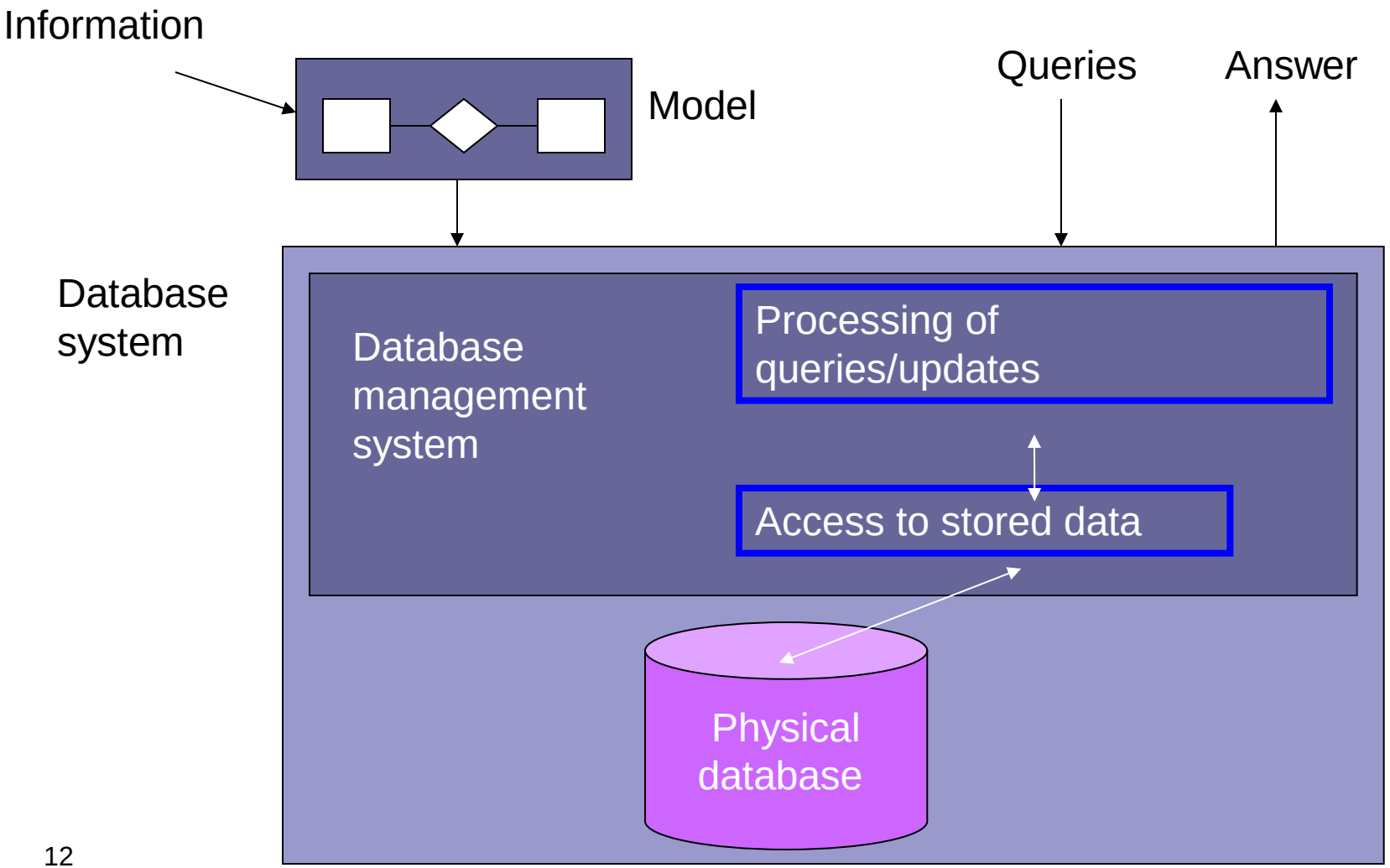
DEFINITION	Homo sapiens adrenergic, beta-1-, receptor
ACCESSION	NM_000684
SOURCE ORGANISM human	
REFERENCE	1
AUTHORS	Frielle, Collins, Daniel, Caron, Lefkowitz, Kobilka
TITLE	Cloning of the cDNA for the human beta 1-adrenergic receptor
REFERENCE	2
AUTHORS	Frielle, Kobilka, Lefkowitz, Caron
TITLE	Human beta 1- and beta 2-adrenergic receptors: structurally and functionally related receptors derived from distinct genes

Entity-relationship

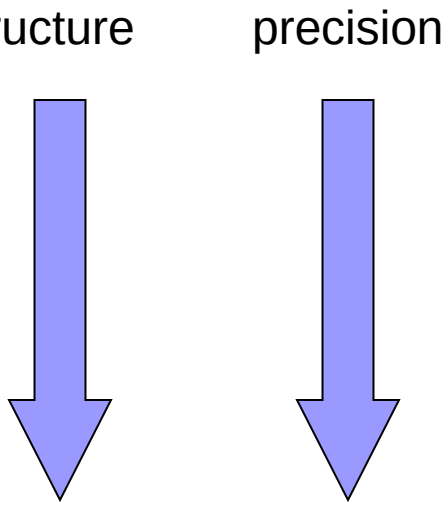


Databases / Data sources



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)



Course overview

- Information Retrieval (HT1 – lectures)
- Semi-structured data, XML and RDF (HT1 - lectures + labs)
- NoSQL databases (HT2 - lectures + lab)
- Semantic Web, Ontologies, OWL (HT1+HT2 - lectures + lab)
- Data integration (HT1+HT2 – lectures + lab)

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)

Examination

- TDDD43
  - Written exam
  - Labs
- DF22300
  - Take home exam
  - Labs

Changes w.r.t. last year

- Update of lectures
- Minor clarifications in labs

My own interest and research

- Modeling of data
  - Ontologies
- Ontology engineering
  - Ontology alignment
    (Winner Anatomy track OAEI 2008 /
    Organizer OAEI Anatomy track since 2013 /
    Organizer Interactive track since 2015)
  - Ontology debugging
    (Founder and organizer WoDOOM/CoDeS since 2012)
- Former work: knowledge representation, data integration, knowledge-based information retrieval, object-centered databases
- http://www.ida.liu.se/~patla00/research.shtml