



# UiT The Arctic University of Norway

<b>Short home exam in:</b>	Inf- 3701
<b>Date:</b>	Thursday 20.05.2021
<b>Time (duration):</b>	4 hours
<b>Course coordinator:</b>	Randi Karlsen
<b>Number of pages:</b>	2
<b>Support:</b>	You may call 776 20 880 for support.
<b>Weighting of questions, or other information:</b>	
<b>Important information about this exam</b>	<ol style="list-style-type: none"><li>1. This is an individual examination and must be completed without cooperation of any kind.</li><li>2. You are allowed to use any kind of sources (lecture notes, lectures in pdf. format, books, internet-sources) in answering the topics of the exam.</li><li>3. All exam answers delivered in Wiseflow are automatically checked for plagiarism. Be aware that copying sources, web pages, other students or literature without reference is not allowed, and will be considered as cheating.</li></ol>

**Task 1: (25%)**

- a) Describe the characteristics of a *homogeneous distributed database system* and a *heterogeneous distributed database system*. Describe also the main challenges that each of the systems need to solve. Point out important differences between the systems.
- b) Describe the concepts *interoperability* and *semantic interoperability*, and main challenges related to semantic interoperability.  
Explain what an ontology is and how it can support semantic interoperability.

**Task 2: (25%)**

- a) Describe and compare the NoSQL type of systems: key-value store and document store.
- b) Describe the difference between eventual consistency and the consistency obtained through serializability.

**Task 3: (25%)**

- a) Describe what a data warehouse is, illustrate its main architecture, and briefly describe the ETL tasks.
- b) Describe what data mining is, which is its goal, and list the main applications of data mining.

**Task 4: (25%)**

- a) What characteristics do information retrieval systems have in common?
- b) Describe the principle of similarity search based on the so-called Vector Model.