Introduction to the Computer Science Master Course
RAWDATA Spring 2018
Responsive Applications, Web services and Databases
(and the Integrated Project Portfolio)

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RAWDATA Spring 2018

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Computer Science Spring 2018

- **Computer Science Spring 2018**
  - 25 ETCS **RAWDATA** = **R**esponsive **A**pplications, **W**eb services and **Data**bases
    - 10 ECTS course + 15 ETCS project (Portfolio)
    - highly integrated
  - 5 ETCS Elective course

- **Four core areas**
  - Databases,
  - Data communication and Network
  - Information retrieval
  - User interfaces

- **Hands-on practical app-development**
  - We will take a common and very timely approach to app-development and involve important languages, systems, frameworks and standards:
    - SQL, SQL Procedural Language
    - MySQL Relational Database system, MySQL Workbench
    - Visual Studio,
    - C#, LINQ,
    - ASP.NET,
    - RESTful Web services
    - HTML5 / CSS / Javascript

The four core areas

- **Databases – theory and practice**
  - relational model & relational database languages
  - database modelling, database design and normalization,
  - database programming, database optimization

- **Data communication and Network – providing Web Services**
  - network architecture and distributed systems
  - emphasis on web services
  - service development using C# (similar to Java)

- **Information retrieval – building search engines**
  - introduction to Information Retrieval and issues that relate to text databases
  - emphasis on ranking, text indexing, data visualization

- **User Interfaces – developing responsive applications**
  - single-page applications (SPA) with HTML5, CSS and Javascript,
  - responsive applications that can adapt to a wide range of devices, including smartphones, tablets and desktops

RAWDATA course and portfolio project

- **The RAWDATA Course**
  - Four sections covering the four core areas
    - will form a coherent whole,
    - will provide insight into theory and practice, and
    - will focus on highly relevant aspects that relate to application development.
  - *Hand-ins: 5-6 assignments (most are relevant for the project portfolio)*

- **The RAWDATA Project portfolio**
  - Four subprojects
    - partly planned already
    - requirements (not necessary consistent) will initiate each
    - requirements are given by the project owner: your teachers ☺
  - On Reflexive synopsis
    - Discussing and summarizing the Project portfolio
  - *Hand-ins: 4 project reports + 1 reflexive synopsis report*

The Project Portfolio: Four subprojects
A related/integrated project

- **Four subprojects**
  - partly predefined
  - closely linked with the four sections of this course

- **Portfolio project 1: Database**
  - design and implement databases.

- **Portfolio project 2: Web Service**
  - design and implement web services to access and manipulate data in databases implemented in Portfolio project 1.

- **Portfolio project 3: Information Retrieval**
  - draw on aspects of Information Retrieval to improve search and retrieval

- **Portfolio project 4: Responsive applications**
  - develop applications that build on web services developed in Portfolio project 2.

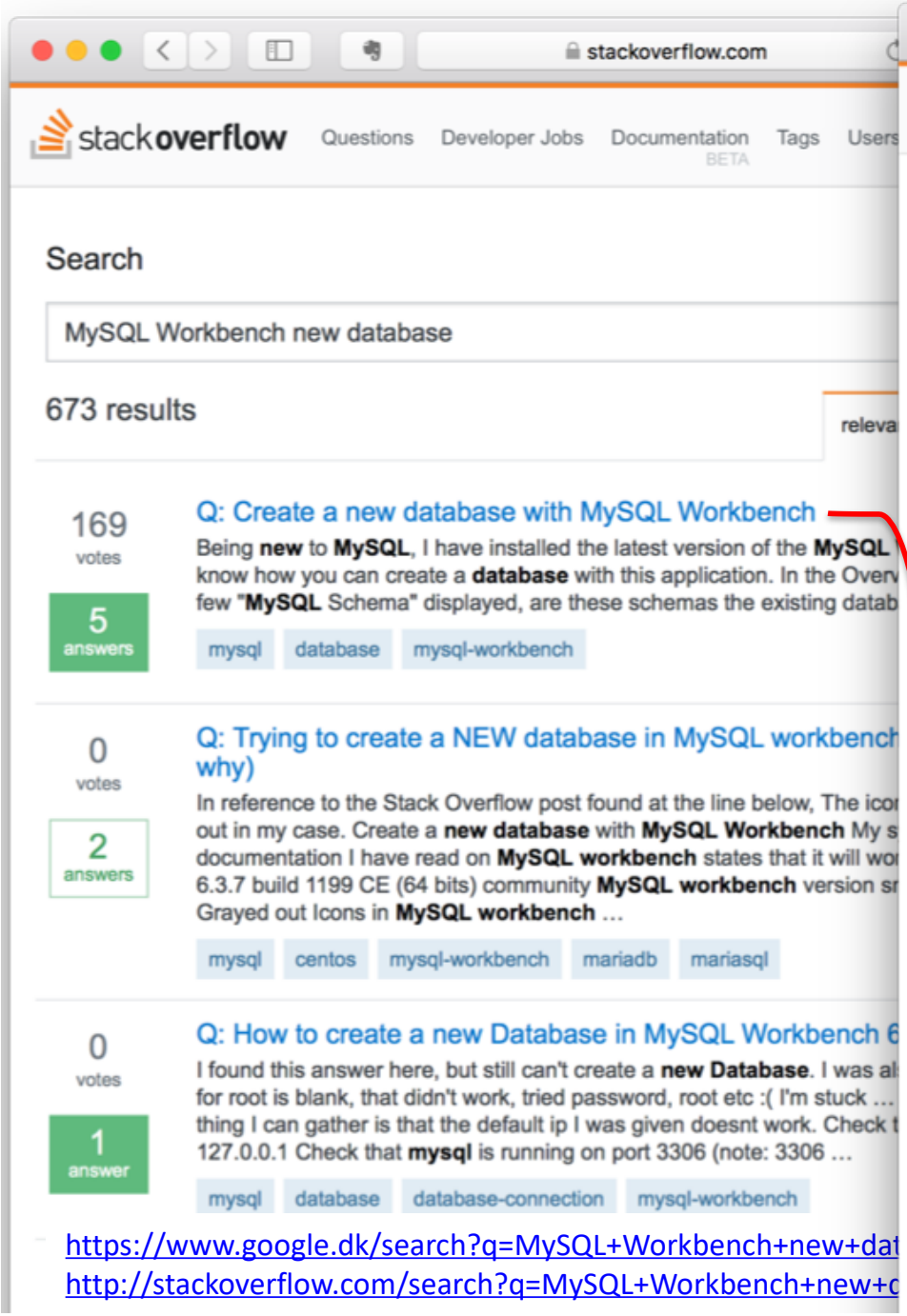
The Project Portfolio

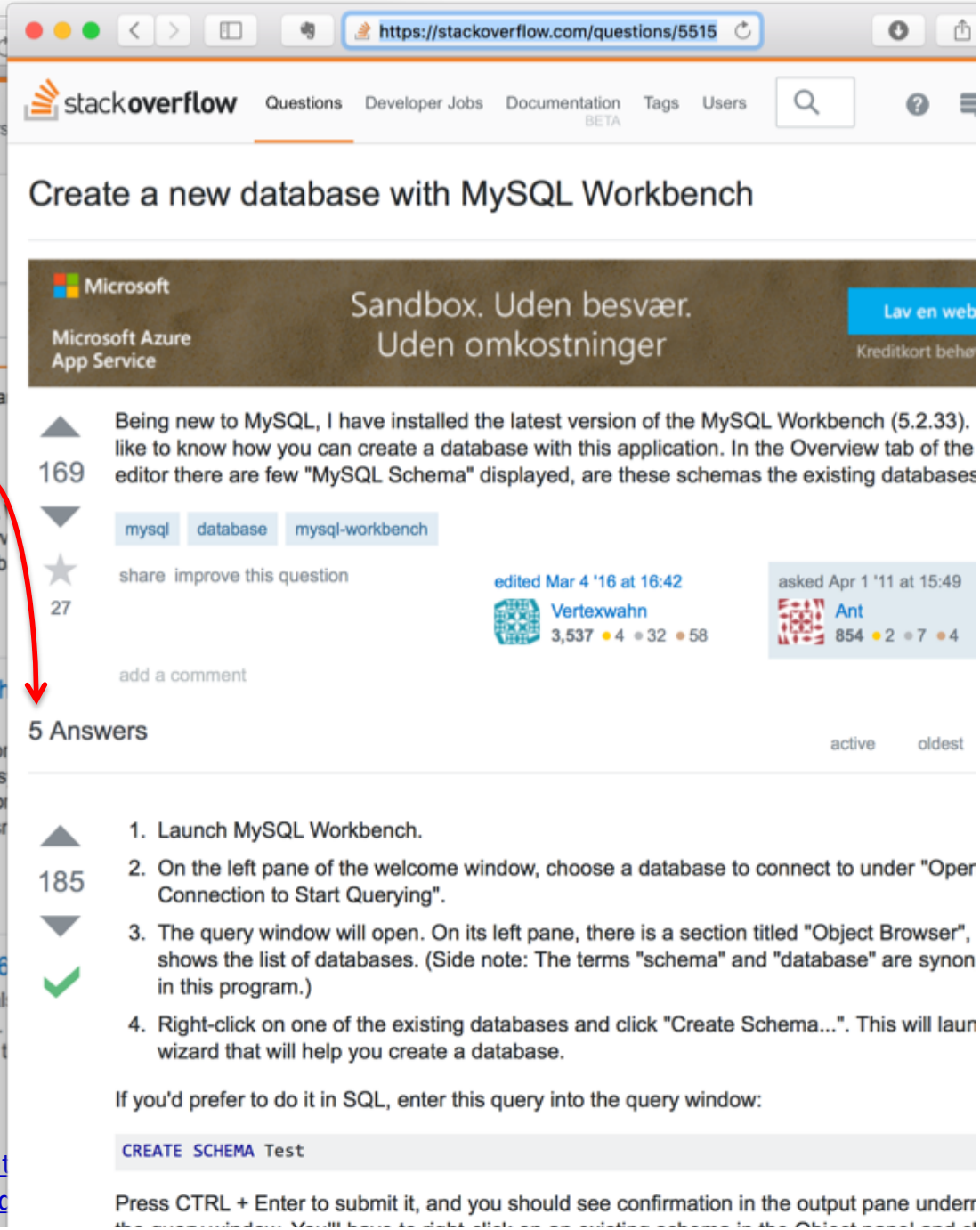
- **Project Portfolio – Problem & Domain**
  - provide a tool to **help computer programmers** develop skills while they are working
  - two complementary functions
    - a keyword-based **search** for answers to questions related to computer programming and
    - a **history and marking** function that keeps track of what's already retrieved (search history) and what parts were the most interesting

- **Key source of data**
  - The Q&A site Stack Overflow
  - We will use a publicly available dump of data from this site

- **What is Stack Overflow?**
  - A question and answer (Q&A) site for programmers,
  - you can search the knowledge captured in the answers and comments to the more than 12 million questions
  - answers are ranked and generally of high quality

What is Stack Overflow?





The Project Portfolio goal: SOVA application

- **Our goal: a Stack Overflow Viewer Application (SOVA)**

- **Basic requirements**
  - Search for posts and comments in Stack Overflow.
  - Present search results as (ranked) lists of posts
  - Visualize search results by most frequent words using ranked lists or word clouds.
  - Keep track of search history.
  - Provide a marking option for posts of special interest among posts presented in the search result and allow optional annotation to marked posts.

- **Open-ended set of additional features**
  - Provide statistics and visualize frequent Stack Overflow topics
  - Similar words search
  - Phrase search
  - Browse topics of interest.
  - Build and visualize networks of associated words and or topics
  - Provide alternative visualizations of marked/annotated posts, such as word graphs showing significant words and their relations
  - …

- **Challenge**
  - to decide on a **small** but well chosen **set of features**

Evaluation

- **Course exam**
  - Individual oral exam
    Examinators: Henrik, Troels and an external censor

- **Project portfolio exam**
  - Group exam on project portfolio and synopsis
    Examinators: Henrik, Troels