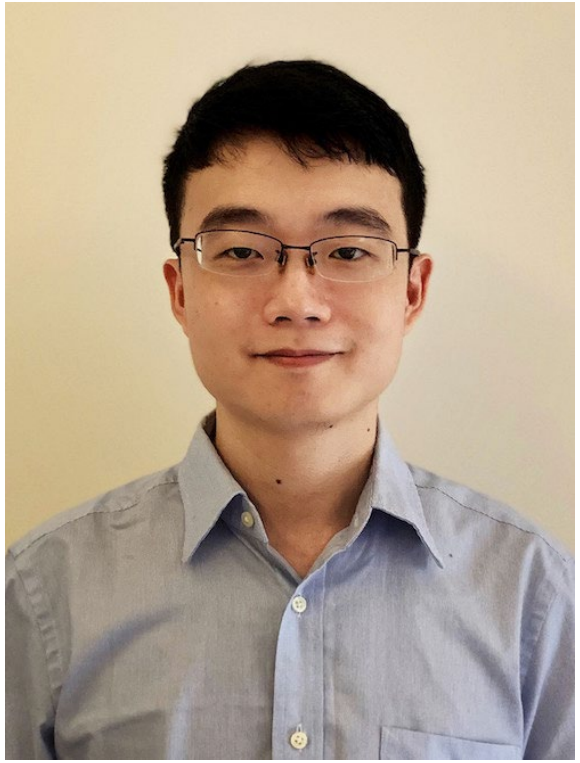
BIG DATA MANAGEMENT

CZ/CE4123

Course Overview 

COURSE INSTRUCTOR

LUO Siqiang (Assistant Professor at SCSE)



Email

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Research area

Big data / data management

Office

N4 Level 2 c-110

Teaching Assistant to help the course project

Wang Fan
FAN008@e.ntu.edu.sg

For all the lecture related questions, please directly email me at siqiang.luo@ntu.edu.sg

For project related problems, you can consult TAs for specifics.

WHAT IS BIG DATA MANAGEMENT?

WHAT IS THIS COURSE ABOUT?

Understand important concepts of big data

Analyze important big data processing techniques

Explain various big data systems

AFTER THIS COURSE, YOU WILL BE ABLE TO…

- ❑ Understand what is big data

Solving math?

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- ❑ Understand what is big data

Solving math?

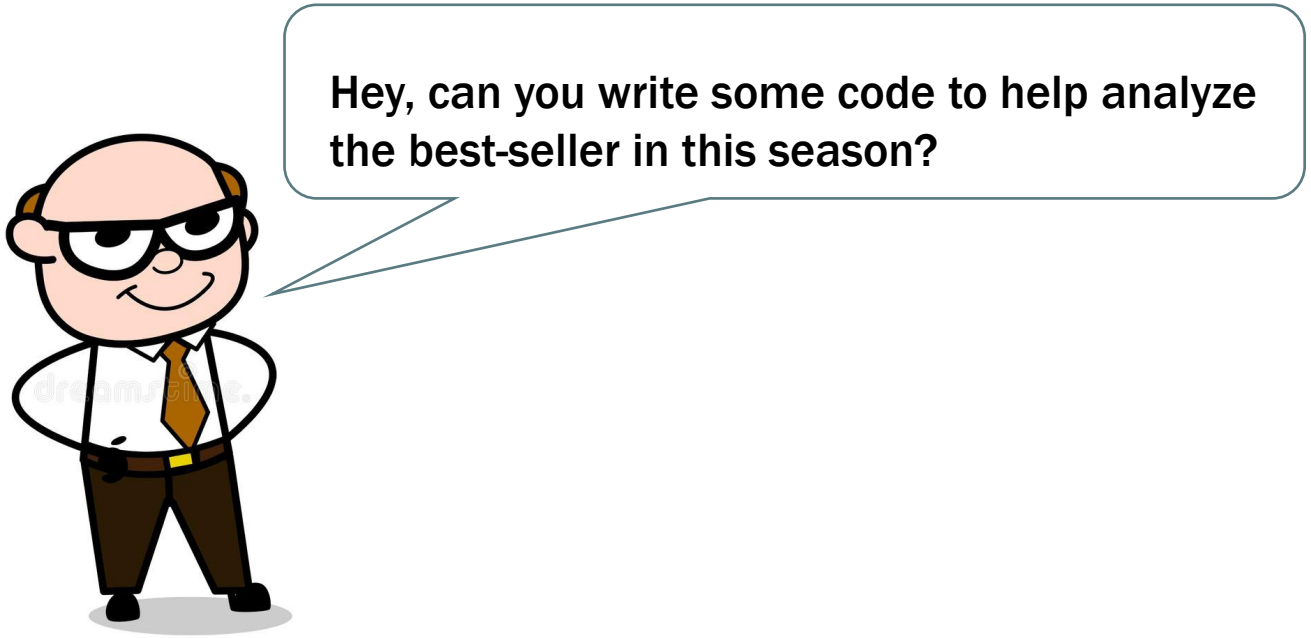
No!

AFTER THIS COURSE, YOU WILL BE ABLE TO...

- ❑ Understand what is big data

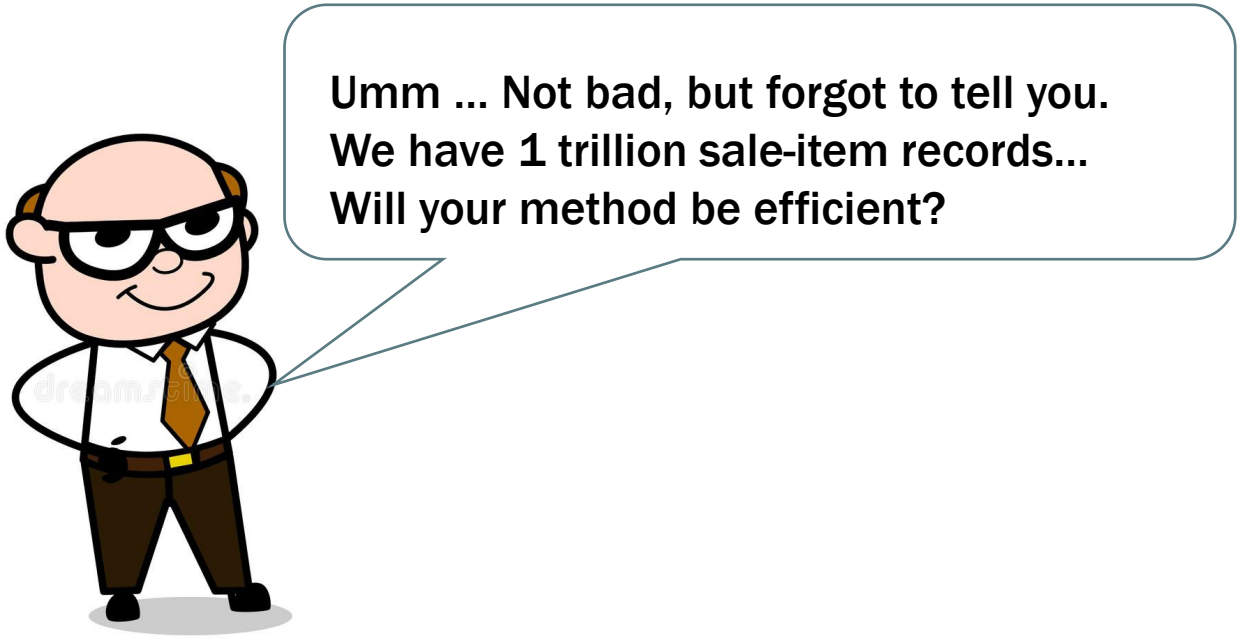
AFTER THIS COURSE, YOU WILL BE ABLE TO...

- Consider a scenario:
  - You are a big data engineer/ analyst in Amazon, your boss assigns you a task:



Sure! I can scan each record and get the selling frequency of each product, and then get the item with the max frequency!

AFTER THIS COURSE, YOU WILL BE ABLE TO...



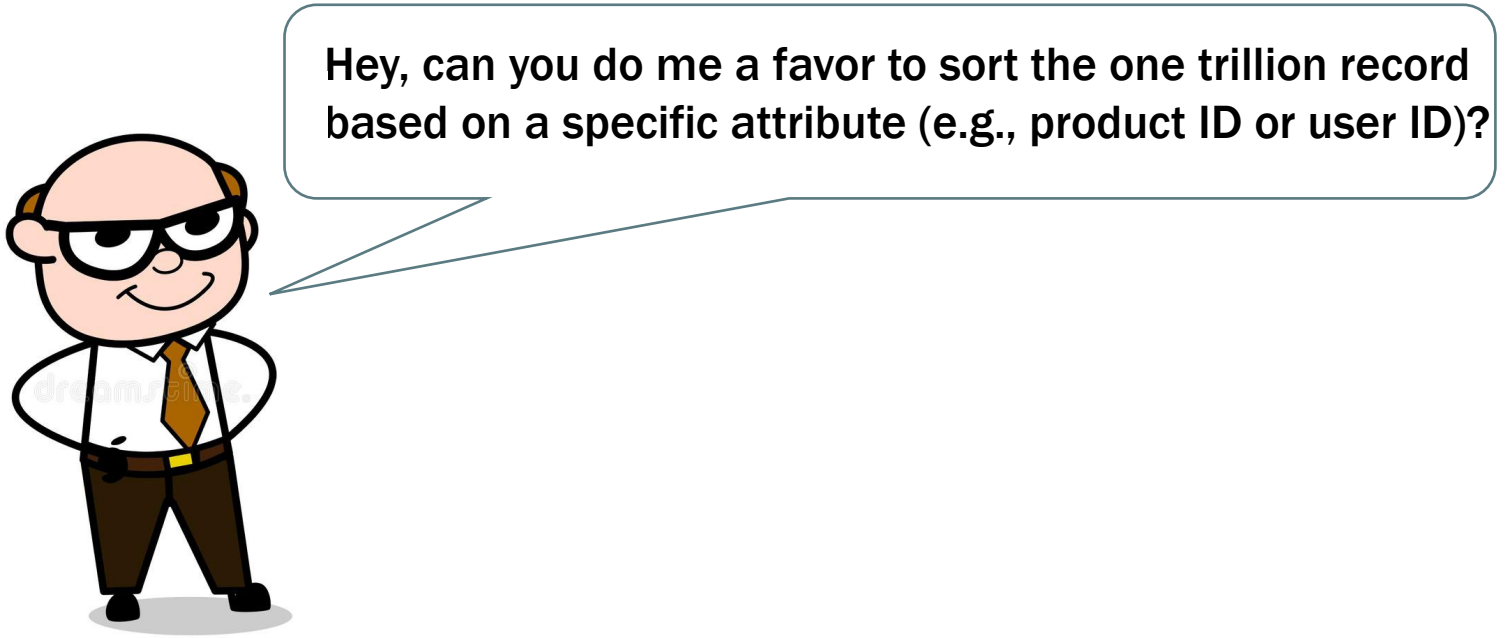
AFTER THIS COURSE, YOU WILL BE ABLE TO…

- You will learn some solutions from the course

- Use a few lines of code to efficiently analyze the “best seller” in retail applications in a distributed system!

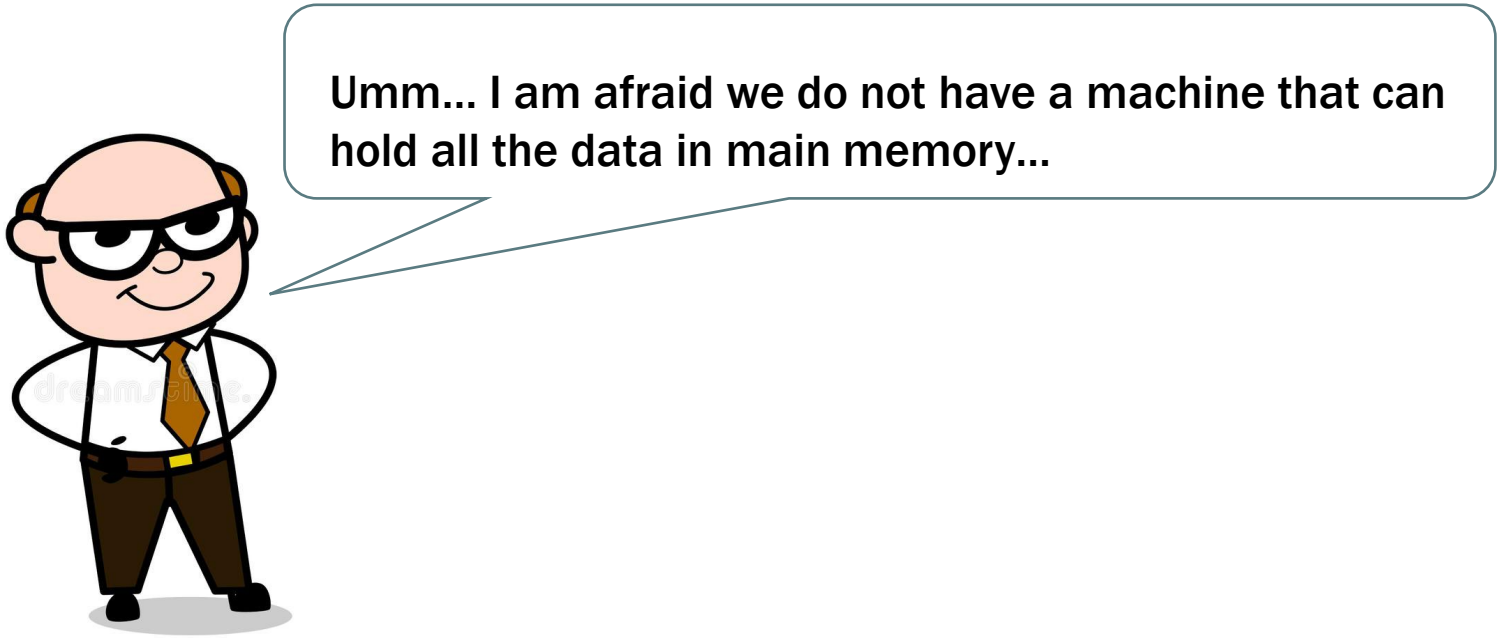
AFTER THIS COURSE, YOU WILL BE ABLE TO…

- Consider another scenario:
  - The other day, you receive an urgent task from your boss:



Easy! I get quite familiar with different kinds of sorting algorithms such as quick-sort, heap-sort, ...

AFTER THIS COURSE, YOU WILL BE ABLE TO...

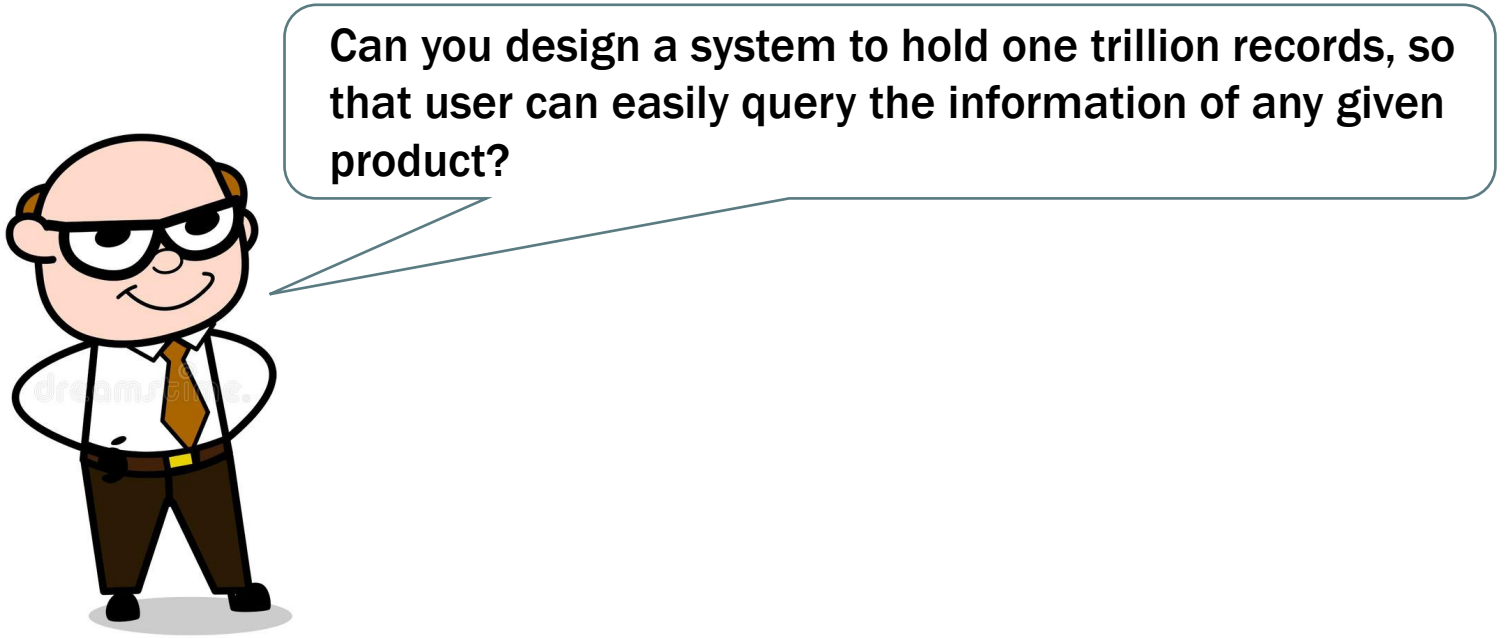


AFTER THIS COURSE, YOU WILL BE ABLE TO...

- After the course, you will probably have some solutions

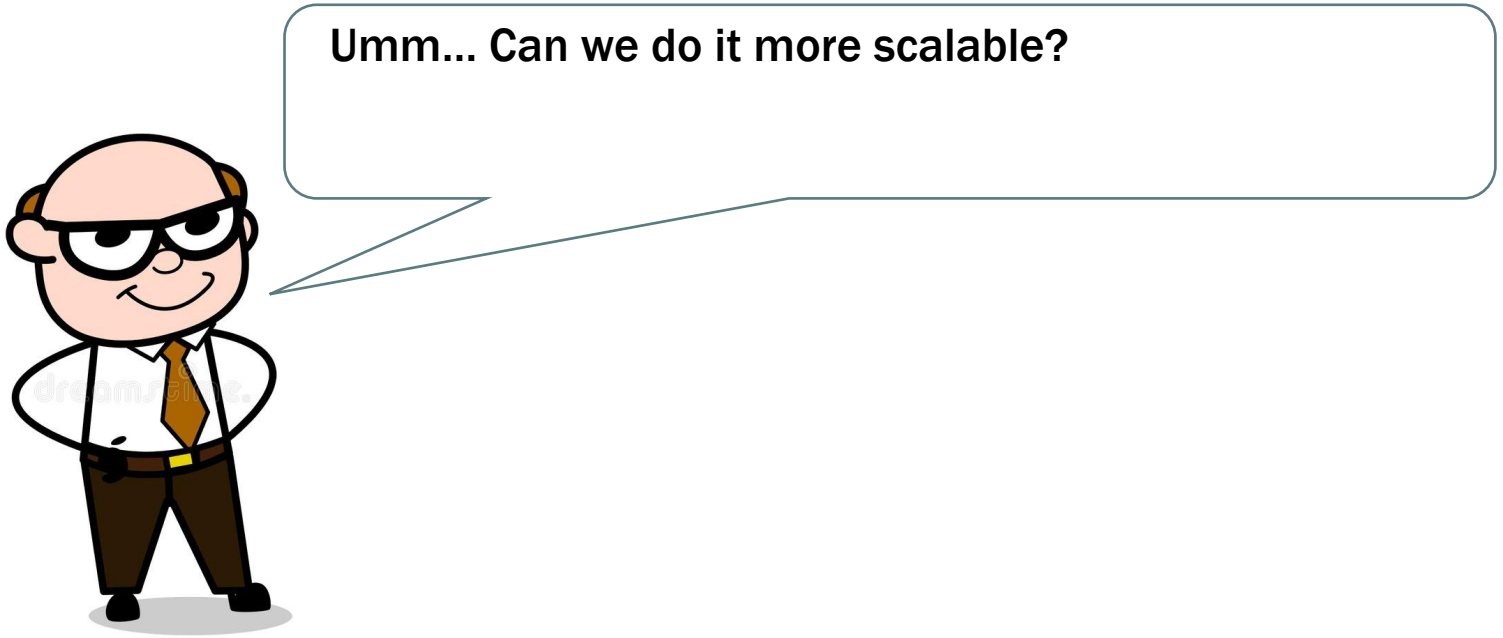
AFTER THIS COURSE, YOU WILL BE ABLE TO...

- Next scenario:
  - 2 years later, you are promoted to a tech leader. Your boss wants you to design a system for easy queries of product item information.



Yeah! I get familiar with SQLServer, ...

AFTER THIS COURSE, YOU WILL BE ABLE TO...



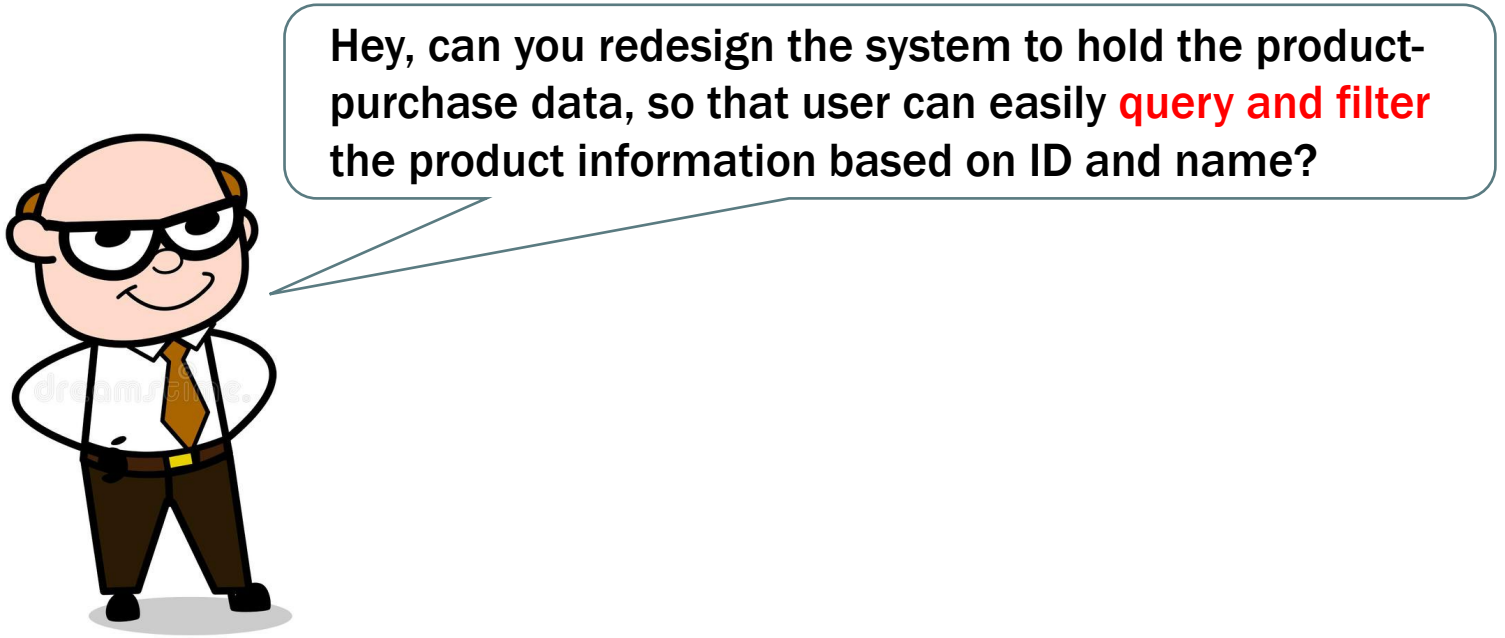
AFTER THIS COURSE, YOU WILL BE ABLE TO...

- After the course, you will probably have alternative solutions

NoSQL Key-Value Stores

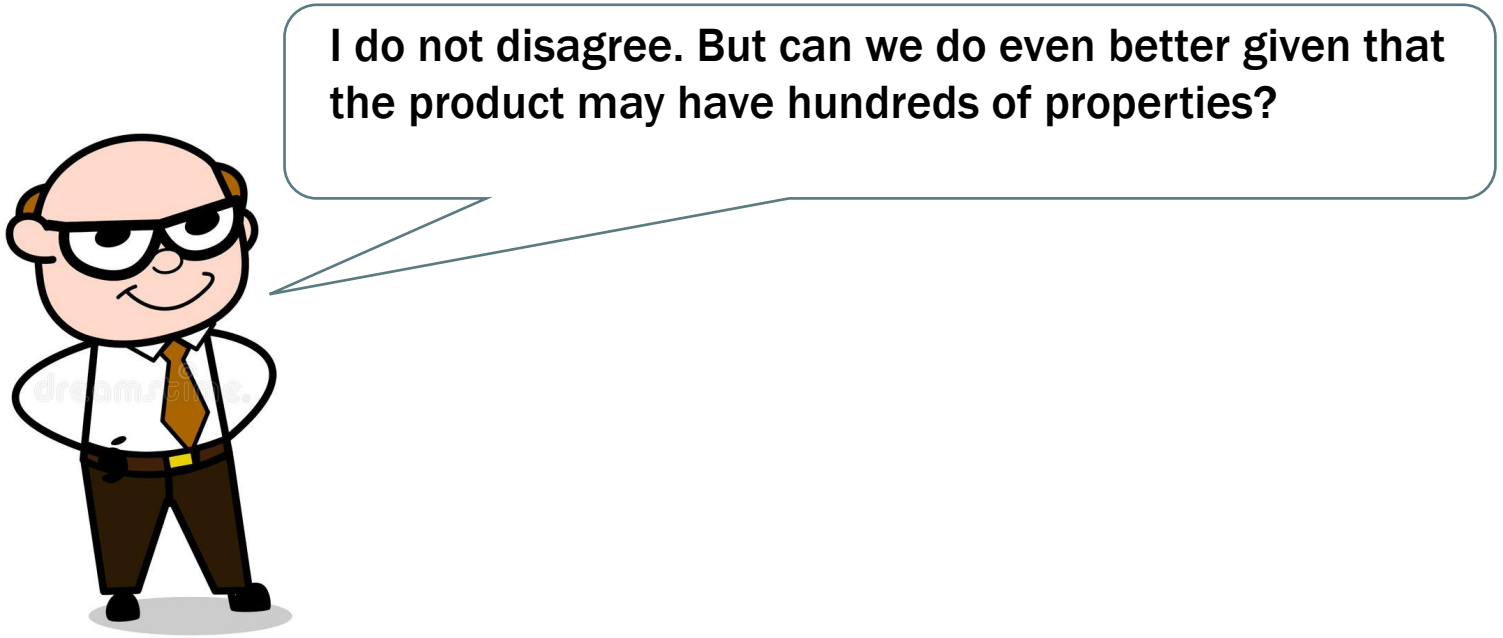
AFTER THIS COURSE, YOU WILL BE ABLE TO…

- Next scenario:
  - 2 years later, your boss wants you to redesign the system.



Well, this time maybe SQLServer is a better solution?

AFTER THIS COURSE, YOU WILL BE ABLE TO...



AFTER THIS COURSE, YOU WILL BE ABLE TO...

- ❑ After the course, you will probably have alternative solutions

Column Store

PREREQUISITES

Course CZ2007:

Introduction to Databases

~~CE/CZ4031:~~

~~Database system principles~~

THIS COURSE IS

- ❑ NOT a programming language course
  - ✓ Will not teach SQL (had learnt it in CZ2007)
  - ✓ Will not teach C or Java (may had learnt it in other courses)
  - ✓ Though we assume you understand **one of** basic SQL or C or Java

- ❑ NOT a traditional database course
  - ✓ Will not teach relational database (may recap if necessary)

BIG DATA MANAGEMENT – COURSE OVERVIEW

We will discuss interesting big data techniques!

- Big Data 5V's
- Memory Hierarchy
- Column Store
- Distributed MapReduce Systems
- NoSQL Key-Value store

BIG DATA MANAGEMENT – COURSE OVERVIEW

Most of the techniques are cutting-edge techniques in big data!

No text books – Slides contain everything

Big Data 5V's	Memory Hierarchy	Column Store	Distributed MapReduce Systems	NoSQL Key-Value store

LECTURE STYLE

- The purpose of the course is to expand your vision, both conceptually and technically.
- I tend to encourage questions and (open-ended) discussions during the class.
- I tend to link the techniques to some real industrial systems.

TUTORIAL STYLE

In the tutorial of this course, you will be

- Taught with solving some theory questions related to big data techniques;

- Hands-on tutorials to walk you through some widely adopted big-data systems, such as Hadoop (used by many companies) and RocksDB (used by Facebook/Meta). You will not be examined on the procedure; instead, our purpose is to give you some resources which might be useful when you join the industry in the future.

COURSE SCHEDULE

Week 1 – Week 13: Course lectures

Venue: LT27

Time: 15:30pm – 17:20pm on Tuesday

Week 3 – Week 13: Tutorials

Venue: LT27

Time: 11:30am – 12:20pm on Monday

Quiz: Week 10 tutorial

EVALUATION (TENTATIVE)

1 Quiz:

25%

1 Group Project:

25%

Final:

50%

QUESTIONS WANTED!!

I welcome all kinds of questions during the course!!

Let’s start the journey!