Vietnam National University of HCMC
International University
School of Computer Science and Engineering

Data Analysis (IT137)

Nguyen Trung Ky, PhD

ntky@hcmiu.edu.vn

Basic Information about course

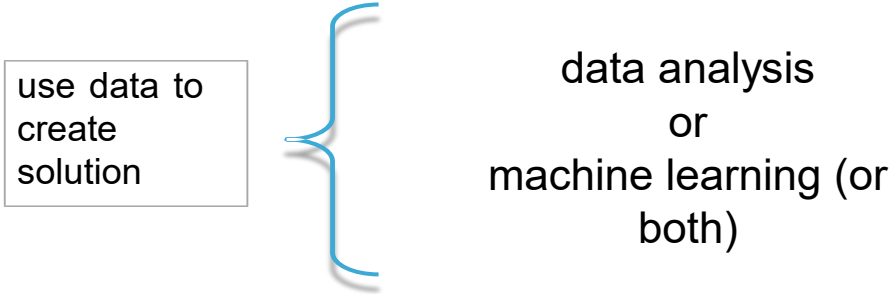
- Instructor: Dr. Nguyen Trung Ky.
  - Ph.D. Grenoble Alpes University 2019; second year at IU.
  - Research on Computational Linguistics (Natural Language Processing, Natural Language Generation) and Machine Learning.
  - Office: O1.610
  - Ask immediately after class or by appointment via email ntky@hcmiu.edu.vn

- Every Friday, 10:35 – 13:05 from 22/09/2023 – 14/01/2024.
- Previous course: Intro to data science
- Course credit: 4
  - Lecture: 3 (from 22/09/2023 – 12/01/2024)
  - Laboratory: 1
    - (Group 1 from 05/10/2023 – 21/12/2023)
    - (Group 2 from 07/10/2023 – 23/12/2023)

WHAT IS DATA SCIENCE?

…solving problems with data…

…which step is most challenging?

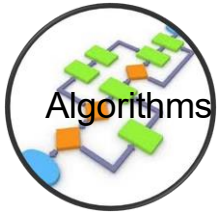


WHAT IS DATA ANALYSIS?

…using data to discover useful information…

- data: anything you can measure or record

- statistics: summarize (and visualize) main characteristics of the data



- algorithms: apply algorithms to find patterns in the data

What types of jobs related data in job market today?

Data Analyst

"The Astronaut"

Better, faster decision-making

Analytics Engineer

"Mission Control"

Better data for decision-making

Data Scientist

"The Astrophysicist"

R&D on new capabilities

Data Engineer

"The Aerospace Engineer"

Build data syncs and data models

SAVANT

What skills and tools are needed?

Data Scientist

"The Astrophysicist"

MISSION: R&D on new analytics capabilities

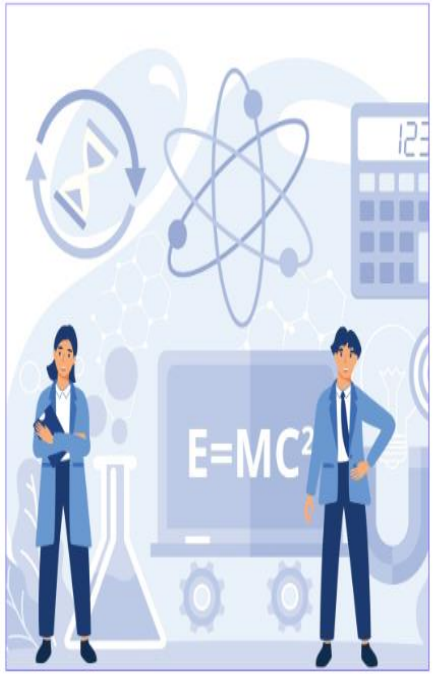
SKILLS

- AI/ML
- Statistical analysis
- Research

TOOLS: Python, R

RESPONSIBILITIES

- Build forecasting and other predictive models
- Detect anomalies and outliers
- Cluster look-alikes
- Research and test new AI/ML techniques



SAVANT

Data Analyst

"The Astronaut"

MISSION: Better, faster decision-making

SKILLS

- Creative problem solving
- Domain knowledge (ex. marketing)
- Quantitative analysis
- Compelling communication

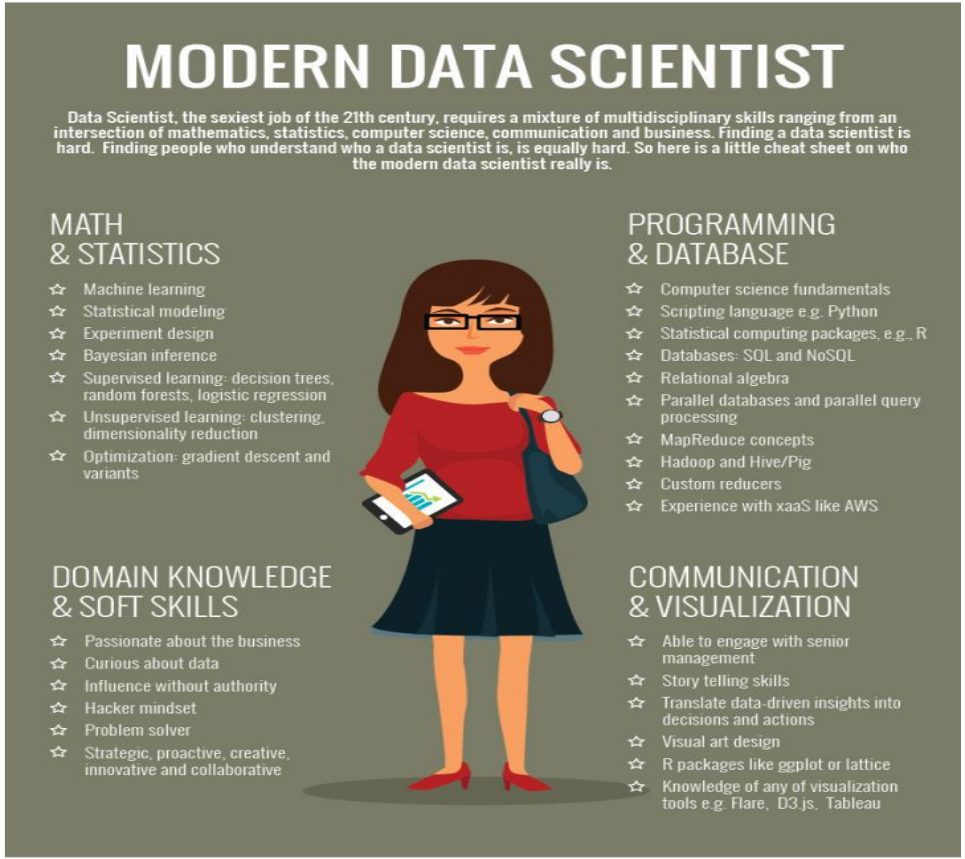
TOOLS: Spreadsheet, SQL, BI

RESPONSIBILITIES

- Inform and guide decision-makers
- Build dashboards and analyses
- Translate business needs into data
- Focus on datasets < 10M rows

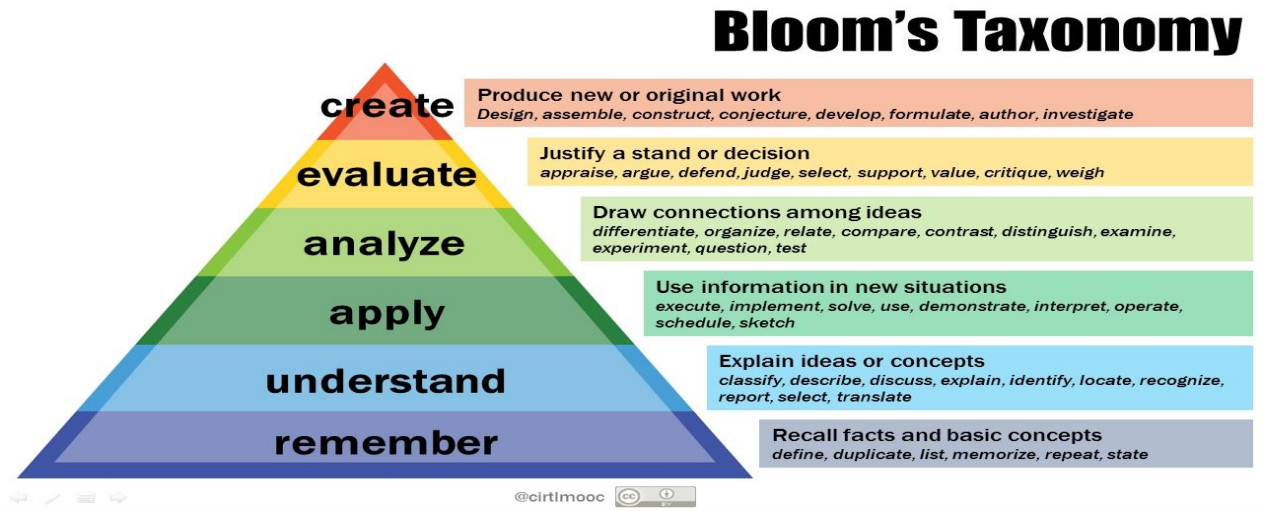
SAVANT

More on job of data scientist



Learning outcomes

1. Understand fundamental concepts of data analysis.
2. Explain how to perform data analysis with **descriptive statistics** and **inferential statistics**.
3. Apply data analysis techniques and tools to some practical cases in business/engineering.



Topics to be covered in this course

Week 1	Course Overview
Week 2	Basic of R
Week 3	Data types & wrangling
Week 4	Data types & wrangling (continue)
Week 5	Summary statistics
Week 6	Summary statistics (continue)
Week 7	Data Plotting
Week 8	Data Plotting (continue)

Topics to be covered in this course

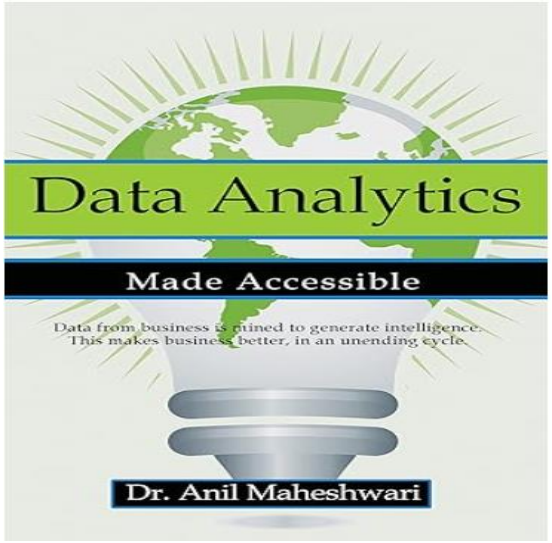
Week 9	Probability Basics
Week 10	Models & parameter inference
Week 11	Hypothesis testing
Week 12	Hypothesis testing (continue)
Week 13	Model comparison
Week 14	Linear regression
Week 15	Linear regression (continue)

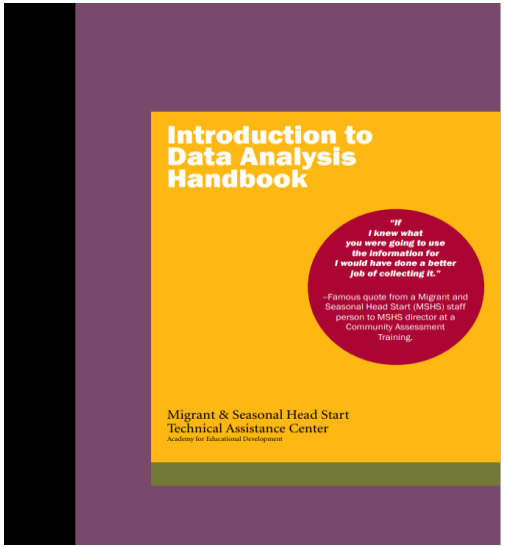
Materials/Books

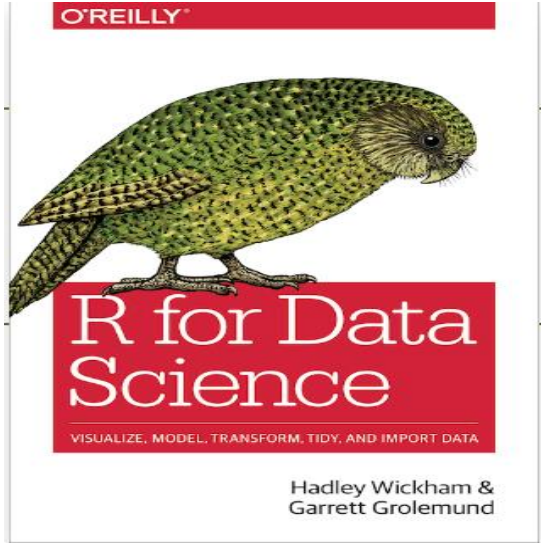
[1] . Anil Maheshwari, **Data Analytics**, 2022

[2]. Migrant & Seasonal Head Start Technical Asistance Center. **Introduction to Data Analysis Handbook**, non-commercial ues only.

[3]. Hadley Wickham & Garret Grolemund, **R for Data Science**. O'reilly 2023.







Some useful websites for R

[1] . https://www.w3schools.com/r/

[2]. https://www.tutorialspoint.com/r/index.htm

[3]. https://www.r-bloggers.com/2021/04/tidyverse-in-r-complete-tutorial/

[4]. https://www.datacamp.com/tutorial/tidyverse-tutorial-r

Why we choose to learn R for Data Analysis?

Applications of R

Why we choose to learn R for Data Analysis?

Why we choose to learn R for Data Analysis?

1. Who Uses R? Companies That Use R and What R Is Used For

https://careerkarma.com/blog/who-uses-r/

2. Why Top Companies are using R Programming

https://data-flair.training/blogs/r-applications/

Why we choose to learn R for Data Analysis?

Please share your experiences on R Language using code **6118 5657** on **menti.com** or the following QR code

Blackboard

- Course information, announcements
  - IT137IU_1_2023-2401: Data Analysis_S1_2023-24_G01(KyNguyen)

- Upload lectures, quizzes or homework

Grading policies

1. Quizzes + Lab Assignments or Project : 30%
2. Midterm: 30%
3. Final: 40%

Thank you for your listening!