Programming and Database Fundamentals for Data Scientists

Introduction

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Outline

Before we begin

- Class webpage - `https://cse.buffalo.edu/~chandola/eas503-ub/`
- UBLearns - Automatically enrolled
- Local setup
  - Python 3 (Anaconda python)
  - MySql Database (or SQLite)
    - `https://razorsql.com/`
  - iPython/jupyter Notebooks

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  - A **detailed**, **step-by-step** set of instructions telling the computer **exactly** what to do.

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- **How can we make computers to do what we want.**
- **What can be computed?**

The Holy Trinity of Computer Science

Design

- Write algorithms to solve problems

Analyze

- Is a problem *solvable* (efficiently)?

Experiment

- Implement algorithms and assess performance

Why Programming in Data Science?

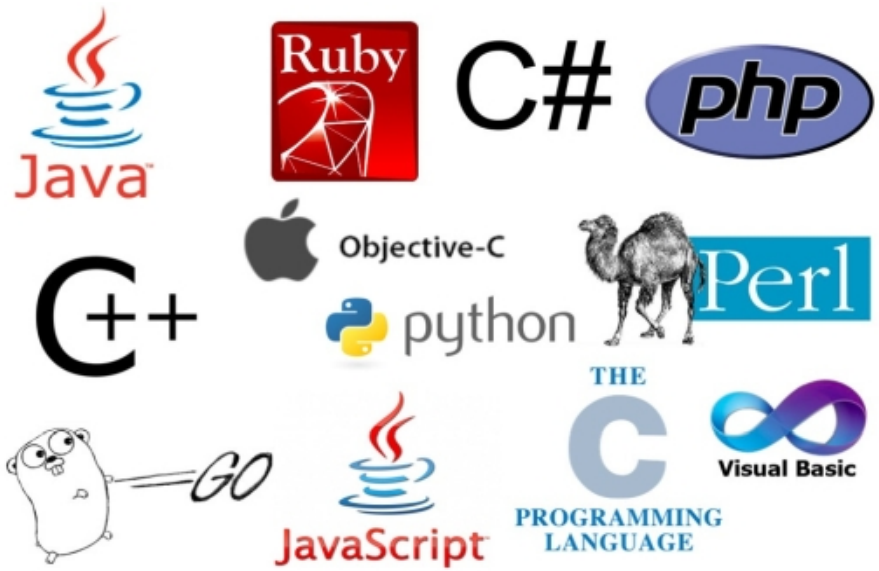
Data Science Pillars

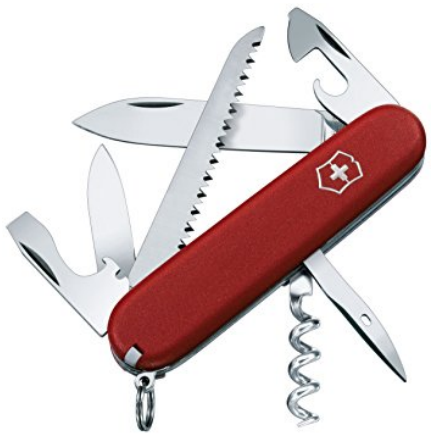
- Math
- Statistics
- **Programming**

- Store and access data
- Manipulate data
- Get insights from data
- Report/visualize results

Why Python?

- "Good enough" for data science
- Quick and intuitive coding
- Thriving ecosystem - abundance of libraries (e.g., Pandas)
- Huge adoption among data scientists





Why Databases and SQL?

- Relational databases – that is where most data lies.
- SQL - language to communicate with the database

References