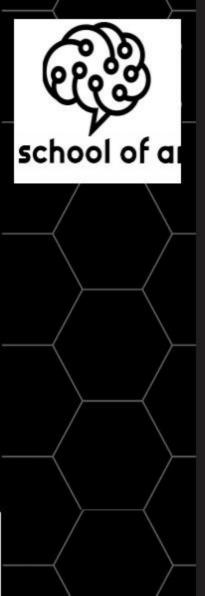


All About Al

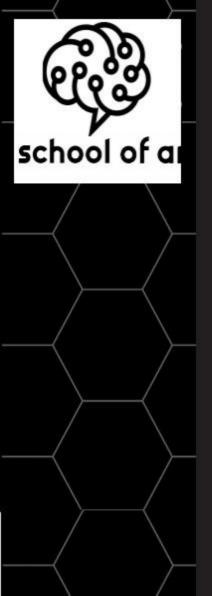
Python Edition

Starts 23 September 2018



Plan

- Course Objective
- Prerequisites
- Components
- Course Length
- Tools Used
- Week 1: Python
- Week 2: Data Manipulation
- Week 3: Supervised Learning
- Week 4: Ensemble Learning
- Week 5: Unsupervised learning
- Week 6: Recommender Systems
- Week 7: Artificial Neural Networks
- Week 8: Reinforcement Learning



Plan (Suite)

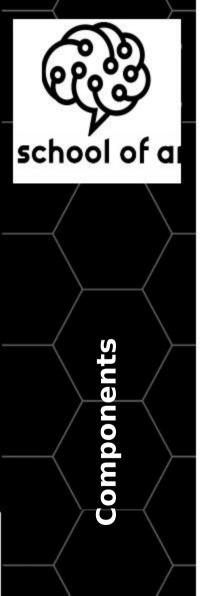
- Week 9: Convolutional and Recurrent Neural Networks
- Week 10: Logic Programming
- Week 11: Search
- Week 12: Planning
- Week 13: Genetic Algorithms
- Week 14: Knowledge Representation
- Final Project
- References



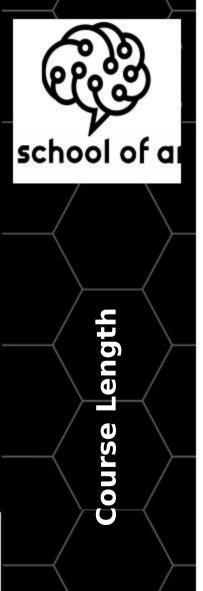
- The course "All About Al" aims to introduce the students to the different branches of Al from a programming angle.
- They will learn the different programming techniques related to the AI field in a particular programming language.
- In this edition, the learning will be in Python



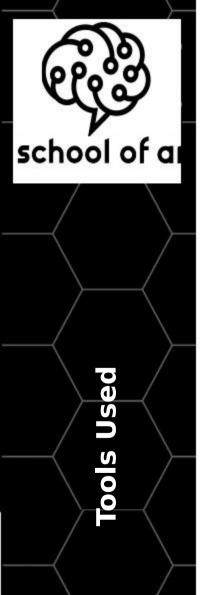
Be familiar with the concept of a programming language



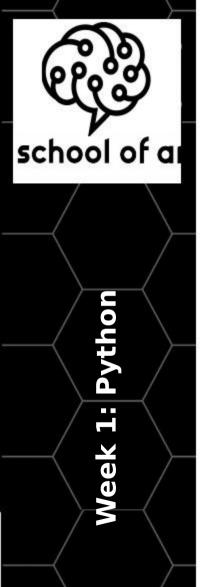
- Educational presentations
- Quizzes
- Reading Assignments
- Coding Assignment
- Students Feedback
- Final Project



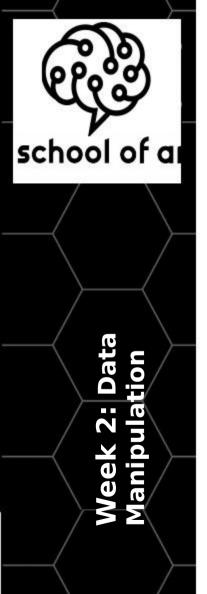
- 14 weeks
- 7-8 hours of dedicated study per week
- Starts September 23 at 8 AM GMT+1



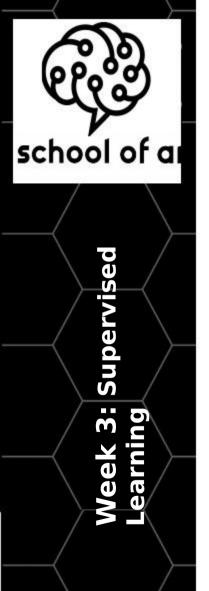
- Google Colab
- Python's libraries
- Eliademy learning platform



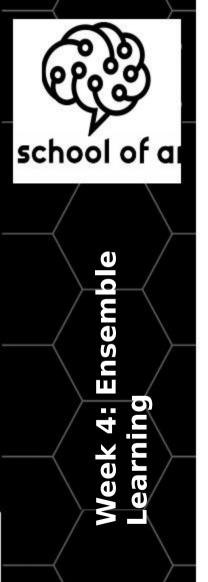
- Introduction to AI, Python and Colab
- Basics (in Python)
- Data structures and control flow
- Regular Expression
- System programming
- Object Oriented Programming



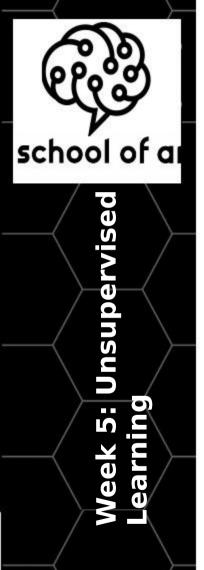
- NumPy & pandas
- Data loading, Storage, and File formats
- Data cleaning and preparation
- Data Wrangling: Join, Combine, and Reshape
- Plotting & Visualization
- Data aggregation and group operations
- Time Series



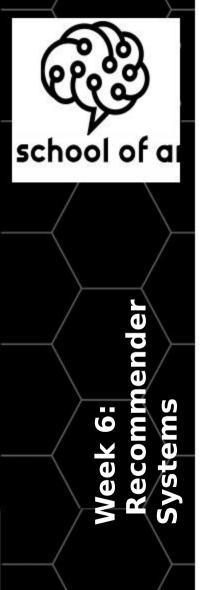
- Supervised learning, classification and Regression
- Linear and polynomial regression
- Linear regression for single and multi-variable data
- Logistic regression classifier
- Naive Bayes classifier
- Support Vector Machine classifier and regressor



- Decision Trees
- Bagging & Pasting
- Random Forest
- Logistic regression classifier
- Adaptive Boosting (AdaBoost)
- Gradient Boosting



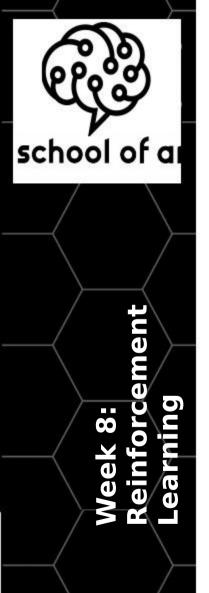
- Unsupervised learning and k-mean clustering
- Mean shift algorithm
- Silouette Scores
- Hierarchical clustering (ward clustering)
- Gaussian Mixture Models
- Affinity Propagation Model



- Extracting the nearest neighbors
- Building a K-Nearest Neighbors classifier
- Computing similarity scores
- User Based Collaborative Filtering
- Item Based Collaborative Filtering
- Building a Recommendation System



- Introduction to ANN
- Perceptron
- Single layer neural network
- Multi layer neural networ
- Tensorflow & Keras
- Training MLP with Tensorflow

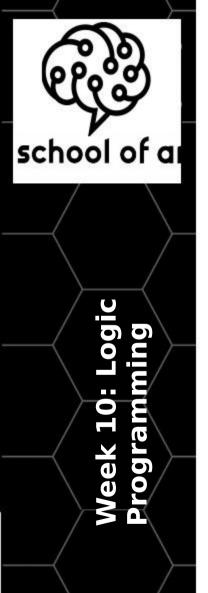


- Introduction to reinforcement learning and Policies
- OpenAl Gym
- Credit Assignment Problem
- Policy Gradients
- Markov Decision Processes
- Temporal Difference Learning and Q-legrning

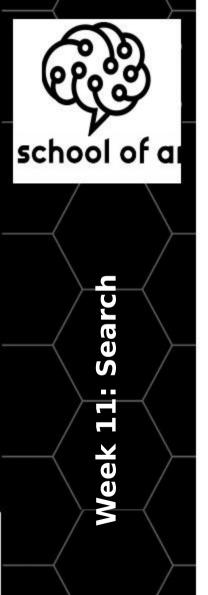


Veek 9: Convolution k Recurrent Jeural Networks

- CNN architectures
- CNN layers: convolutional & pooling layer
- LeNet-5, AlexNet, GoogLeNet, ResNet
- Introduction to RNN and recurrent neurones
- Basics RNN in tensorflow
- Training RNNs



- Logic Programming
- Application: matching mathematical expressions A
- Application: validation primes
- Application: parsing a family tree
- Application: analyzing geography
- Application: building a puzzle zolver



- Uninformed search strategies
- Heuristic search strategies
- Local search Techniques
- Simulated Annealing
- Constraint Satisfaction Problem
- Application: Building a maze solver



- Classical Planning
- Planning as State Space search
- Planning Graphs
- Hierarchical Planning
- Planning and Acting in non deterministic domains
- Implementation for some planning algorithms

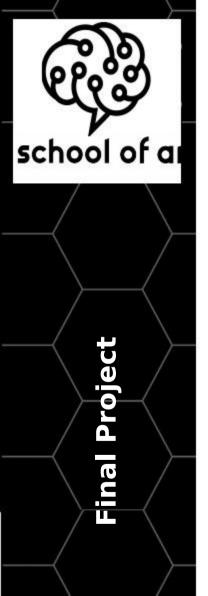


- Genetic algorithms concepts
- Binary and continuous genetic algorithms
- Application: Genetic Search Algorithm
- Application: One max problem
- Application: One max problem variant (generating bit pattern)
- Application: Building an intelligent Robot Controller

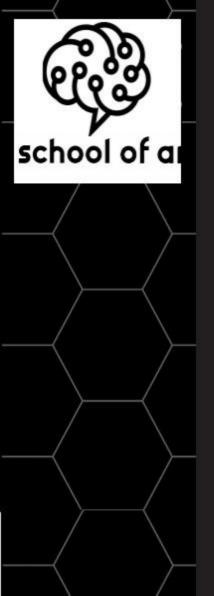


Veek 12: Knowledge Representation

- Ontological Engineering
- Categories and Objects
- Events
- Mental Events and Mental Objects
- Reasoning Systems for Categories
- Reasoning with Default Information

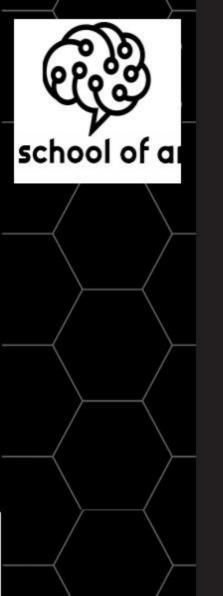


- Creating a git repository
- List of problems
- Apply on of the AI methods to solve one of the given problems



References

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Thank you!

FOR ALL YOUR TIME