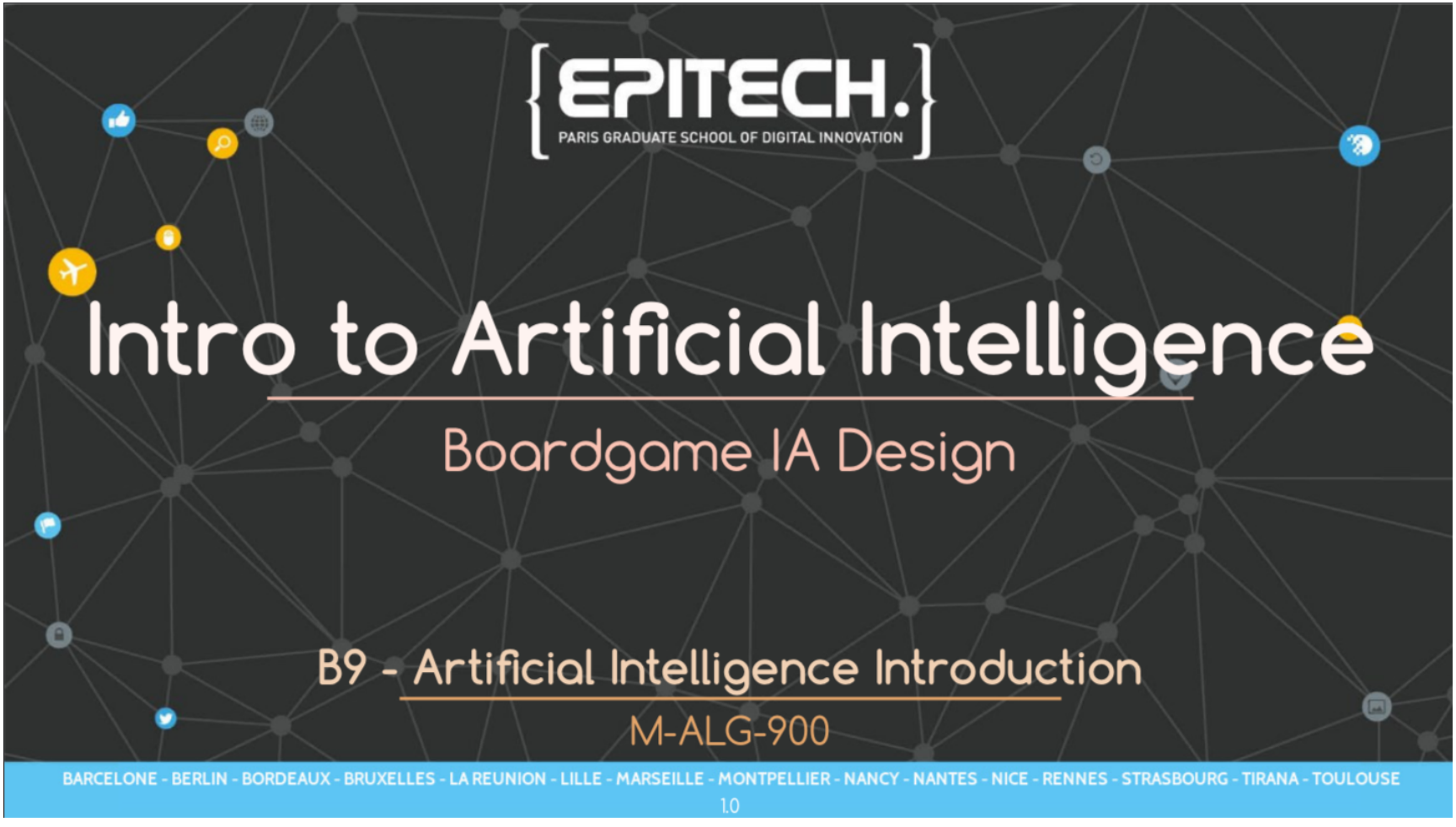
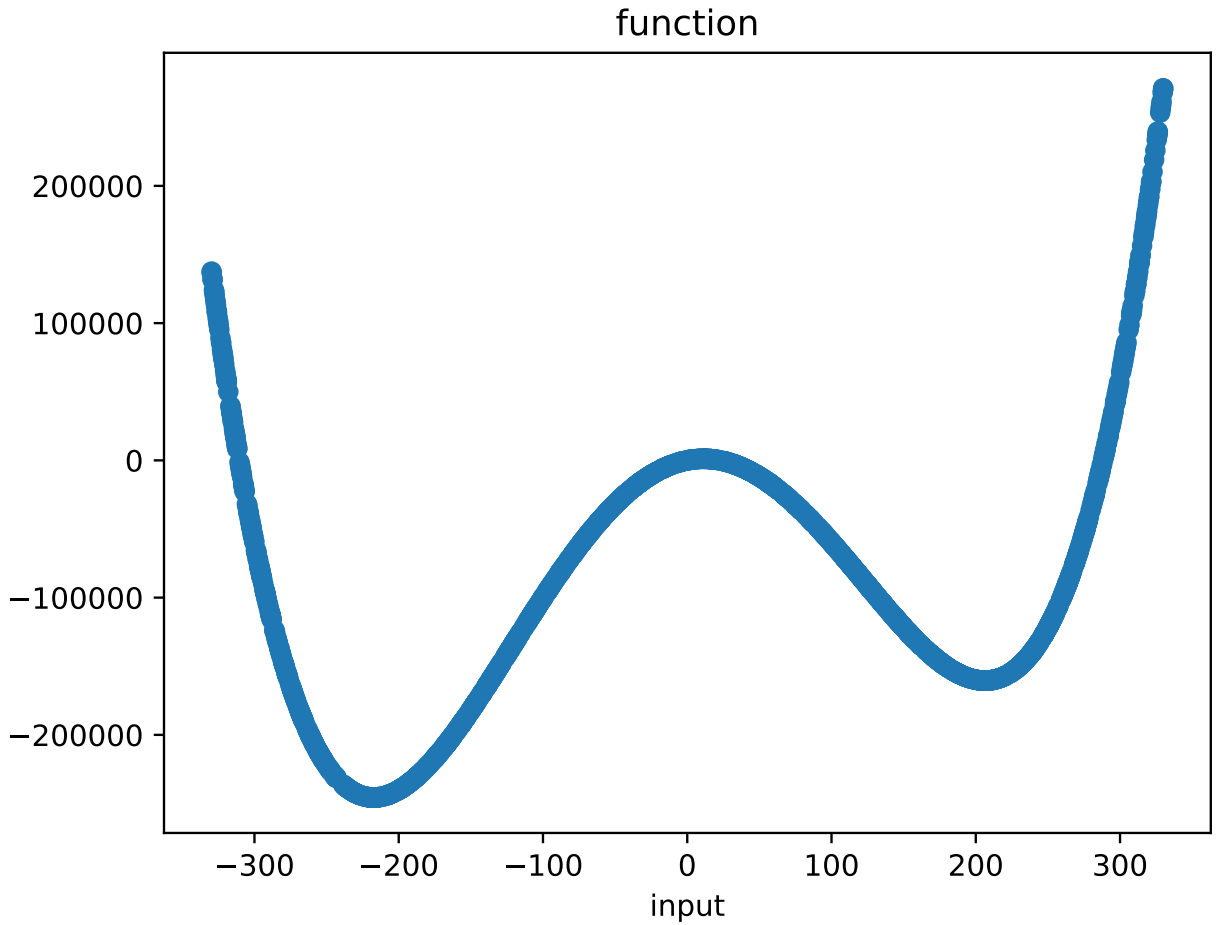
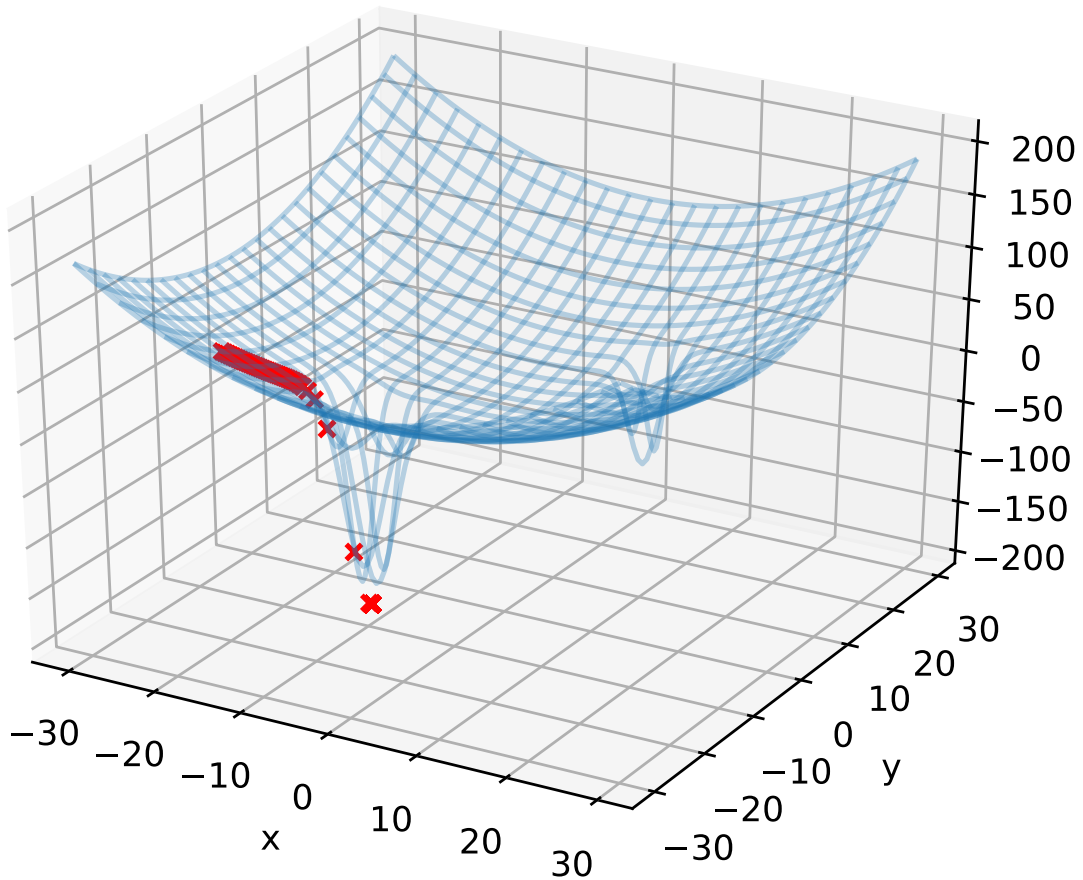
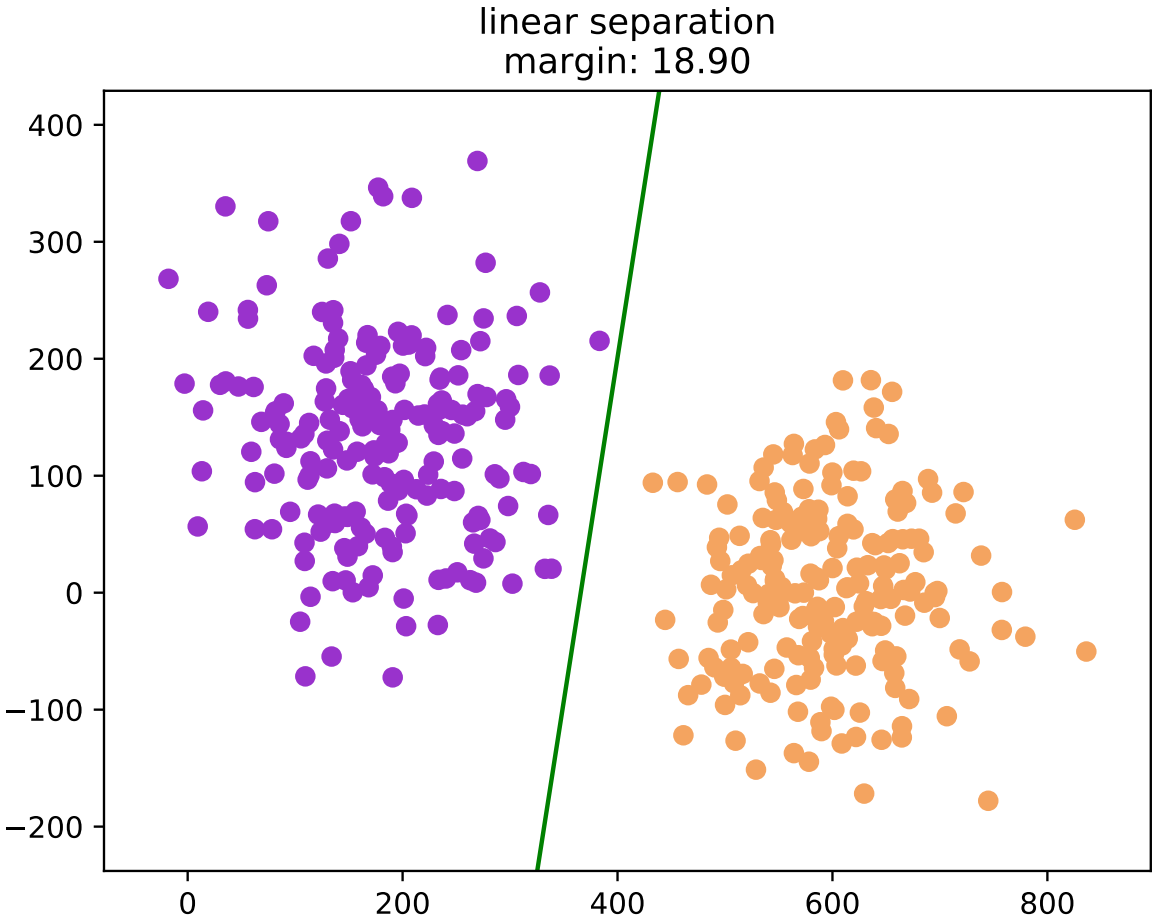
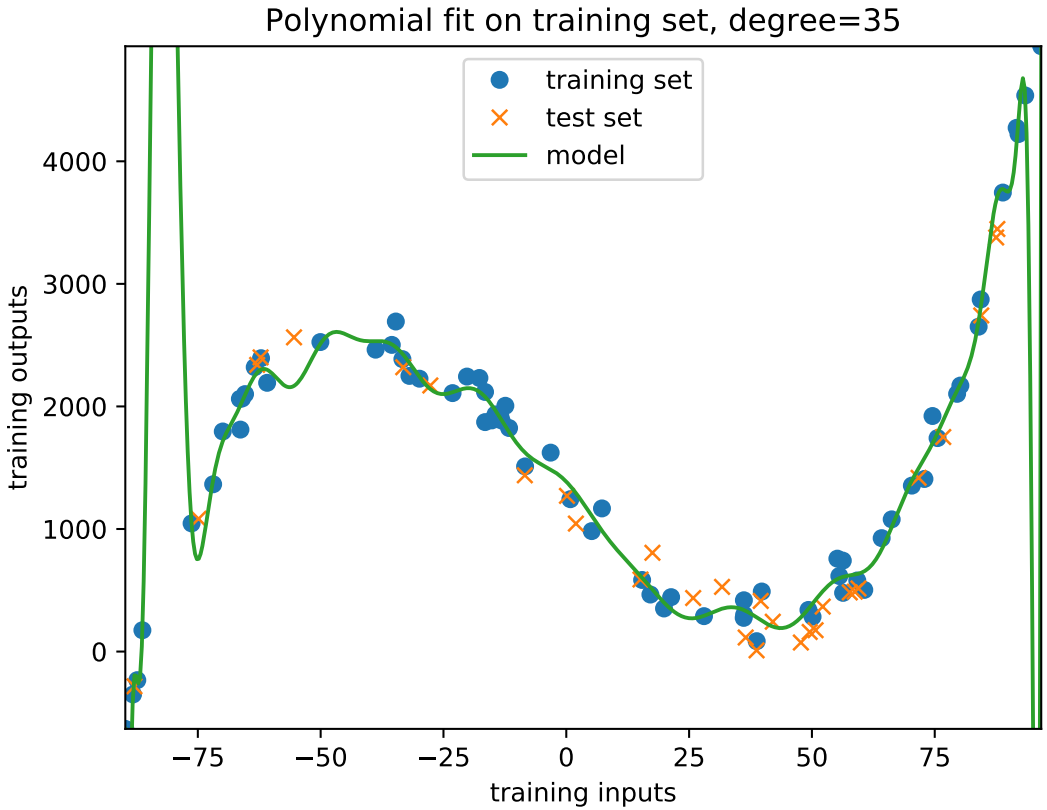

EPITECH.
PARIS GRADUATE SCHOOL OF DIGITAL INNOVATION
Intro to Artificial Intelligence
Boardgame IA Design
B9 - Artificial Intelligence Introduction
M-ALG-900
BARCELONE - BERLIN - BORDEAUX - BRUXELLES - LA REUNION - LILLE - MARSEILLE - MONTPELLIER - NANCY - NANTES - NICE - RENNES - STRASBOURG - TIRANA - TOULOUSE
1.0

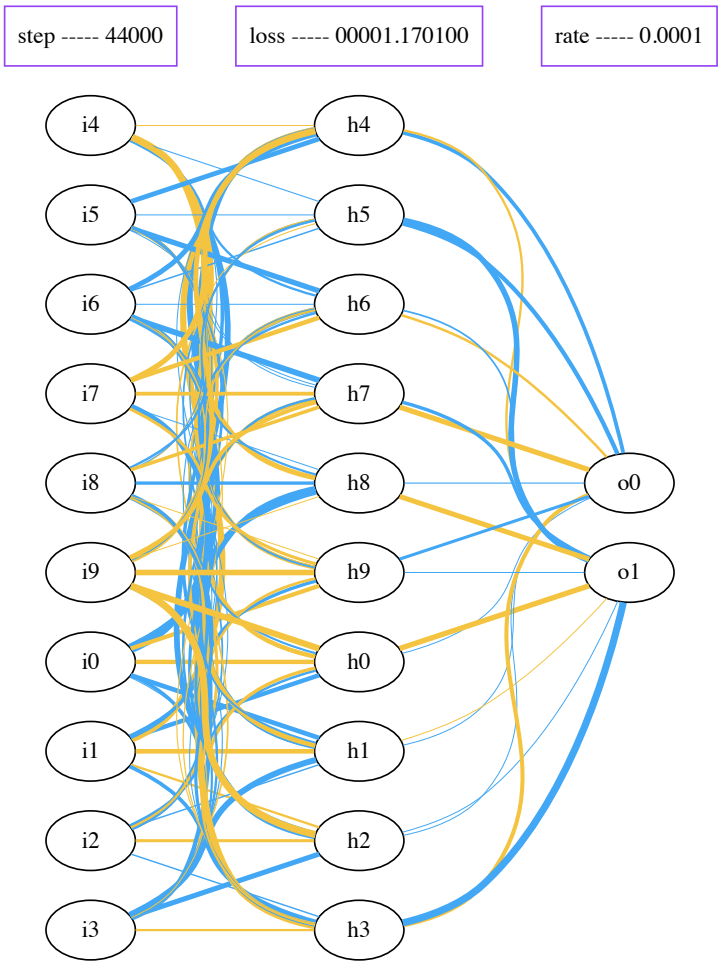
Figure: MNIST database [LeCun and Cortes, 2010]

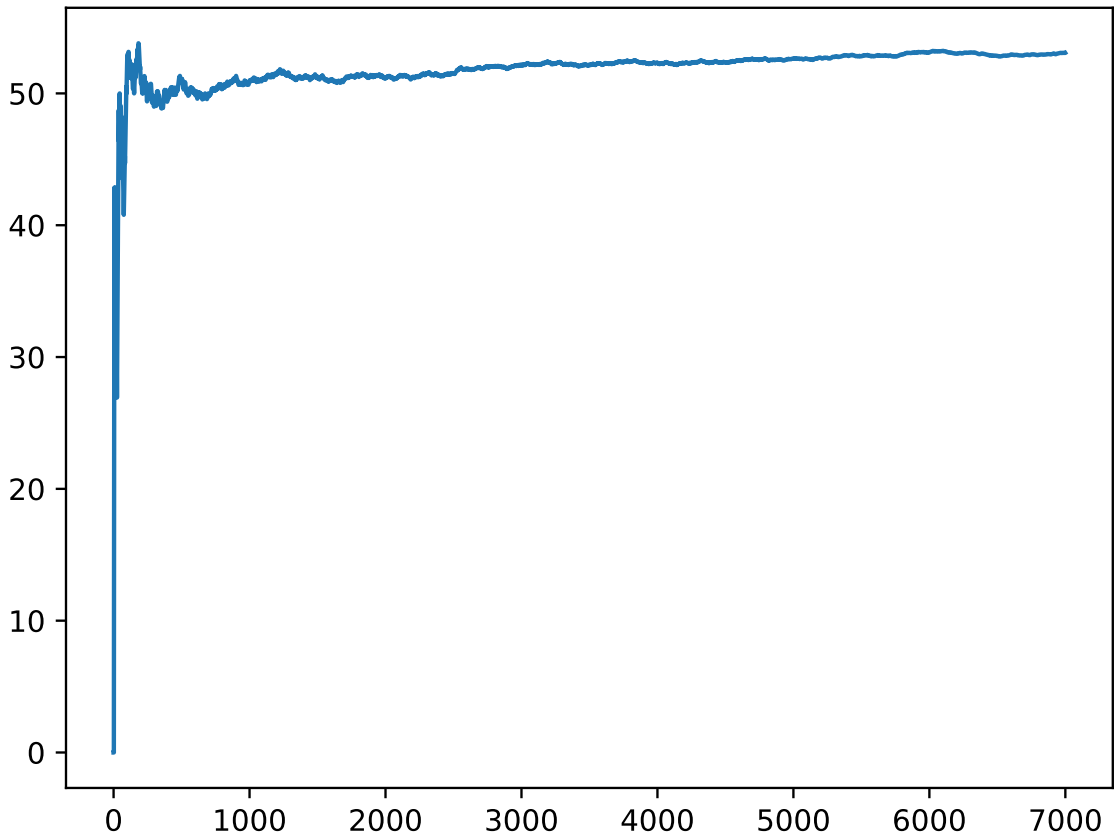

function
200000
100000
0
−100000
−200000
−300
−200
−100
0
100
200
300
input

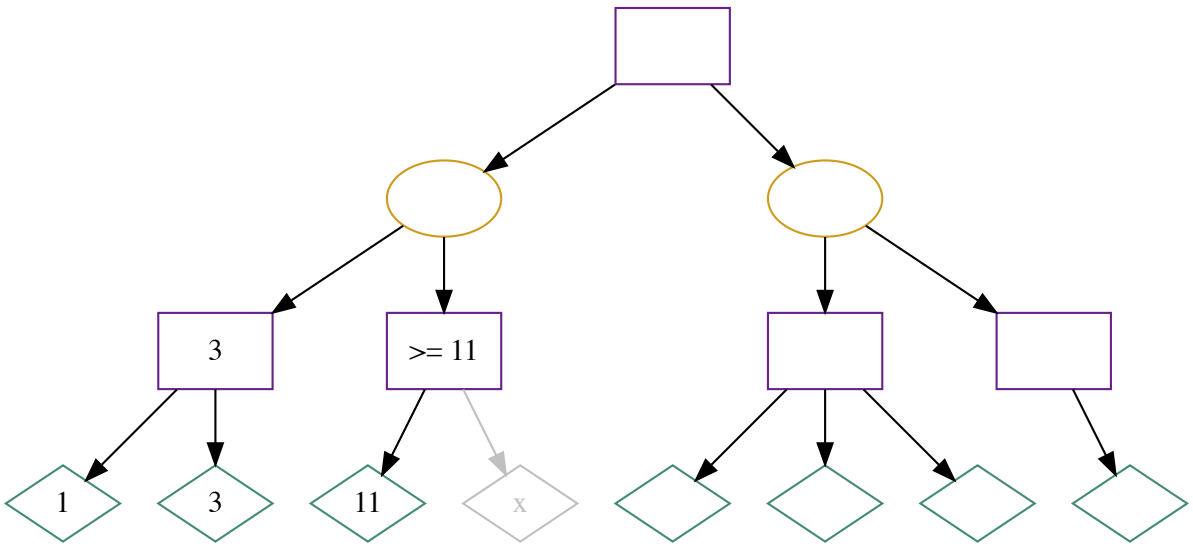

200
150
100
50
0
−50
−100
−150
−200
−30
−20
−10
0
10
20
30
x
30
20
10
0
−10
−20
−30
y


linear separation
margin: 18.90
400
300
200
100
0
−100
−200
0
200
400
600
800


Polynomial fit on training set, degree=35
training set
test set
model
4000
3000
2000
1000
0
training outputs
−75
−50
−25
0
25
50
75
training inputs


step ----- 44000
loss ----- 00001.170100
rate ----- 0.0001
i4
i5
i6
i7
i8
i9
i0
i1
i2
i3
h4
h5
h6
h7
h8
h9
h0
h1
h2
h3
o0
o1


50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
7000


3
>= 11
1
3
11
x

Overview of the module

The module will contain two aspects :

- Theoretical: Presentations and exercises
- Project : Building a game AI

- **Thursday:**
  - General presentation on AI and its paradigms, with exercices

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  - Presentation of the project, of the game, of the server, start of the project

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  - Presentation of the project, of the game, of the server, start of the project
- **Friday:**
  - Activities and exercises on AI topics :
    - Neural networks, application to MNIST
    - Monte Carlo Methods
    - Game theory and A/B decision trees
    - (maybe) Reinforcement Learning
  - Continuation of the project

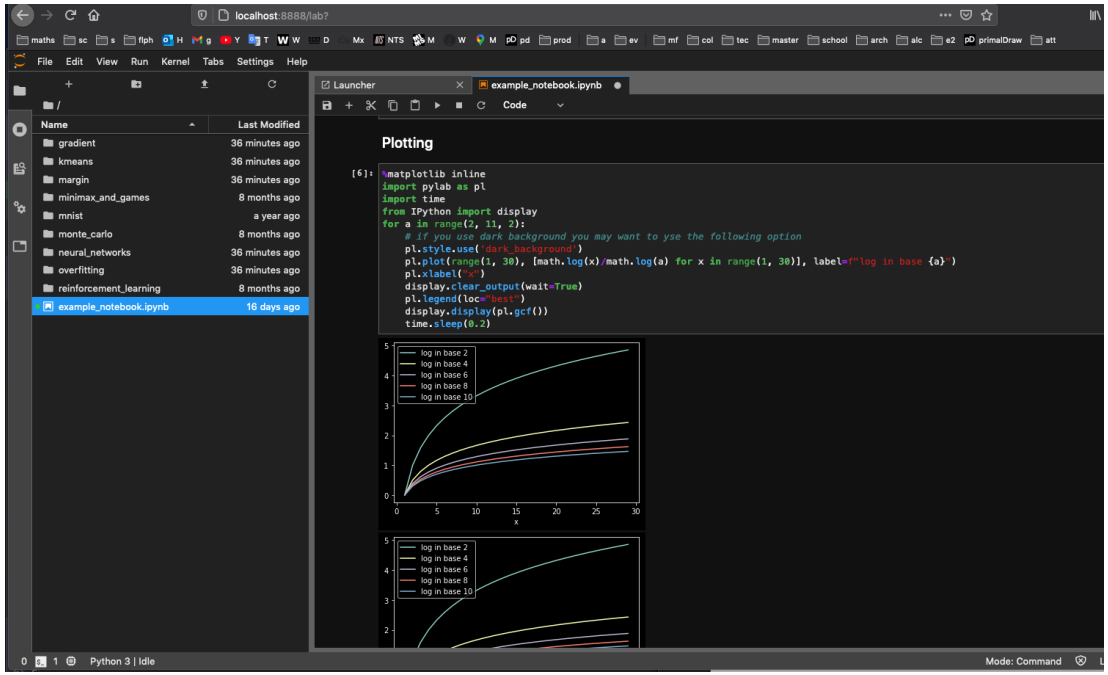
Third party libs

We will work with python, python ¿ 3.6 is preferred.

- **Thursday:**
  - numpy
  - matplotlib
- **Friday;**
  - graphviz
  - pygraphviz
  - tensorflow
- Optionnal : ipdb (debugger)

Organization

- In order to make installation easier and to make the course more interactive, you may use **docker** and **jupyter notebooks**. Please see the **README.md** in the github repo.



Ressources

- **github of the module** : contains presentations and exercises. `https://github.com/nlehir/Intro-AI`
- **github of the game :** : contains the server and example clients. They communicate with sockets. `https://github.com/nlehir/phantom_opera`

Contact

firstname lehir @ gmail.com

References I


LeCun, Y. and Cortes, C. (2010).
{MNIST} handwritten digit database.