

AI: What about it and have we really been surpassed by everyone already?

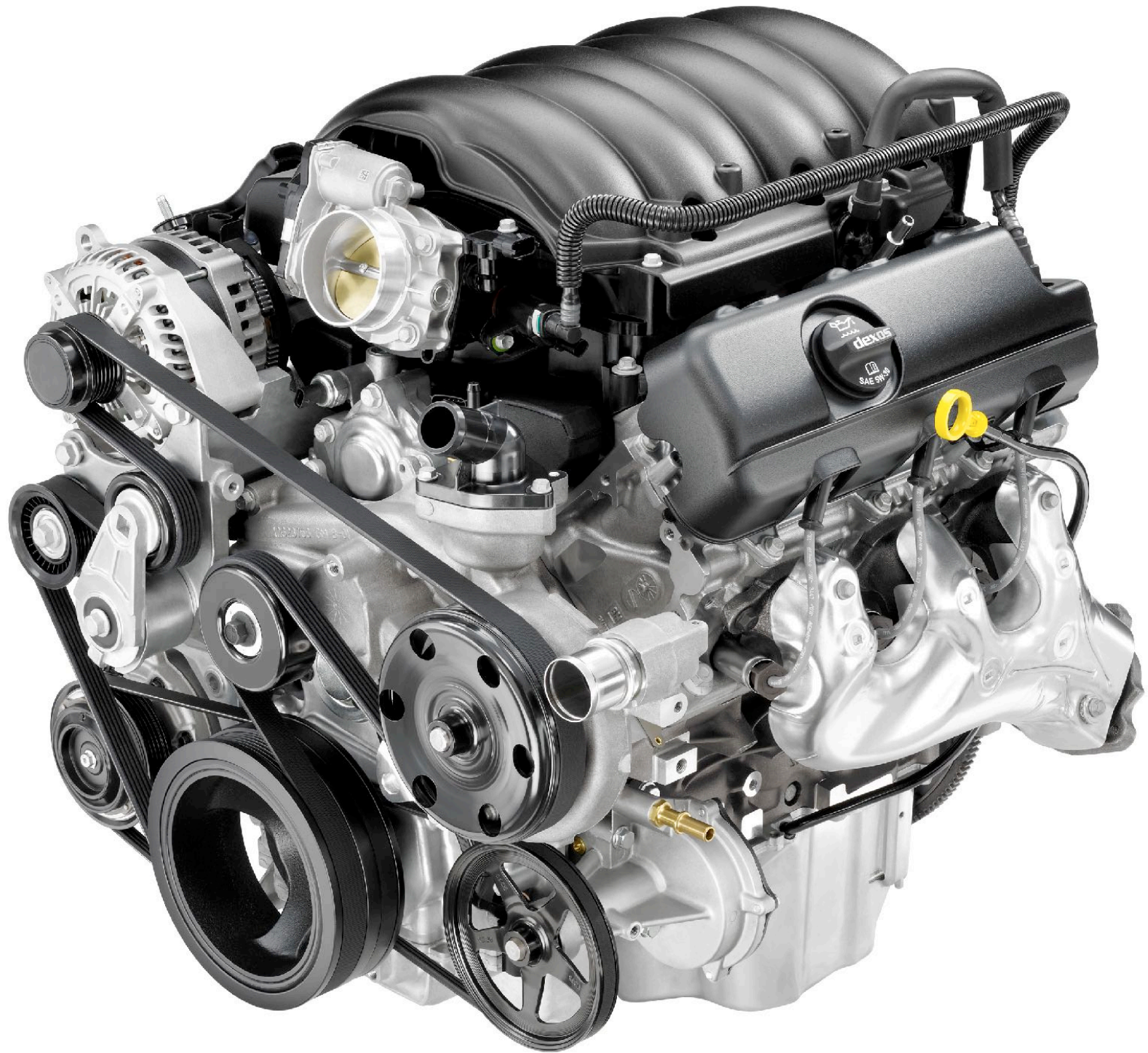


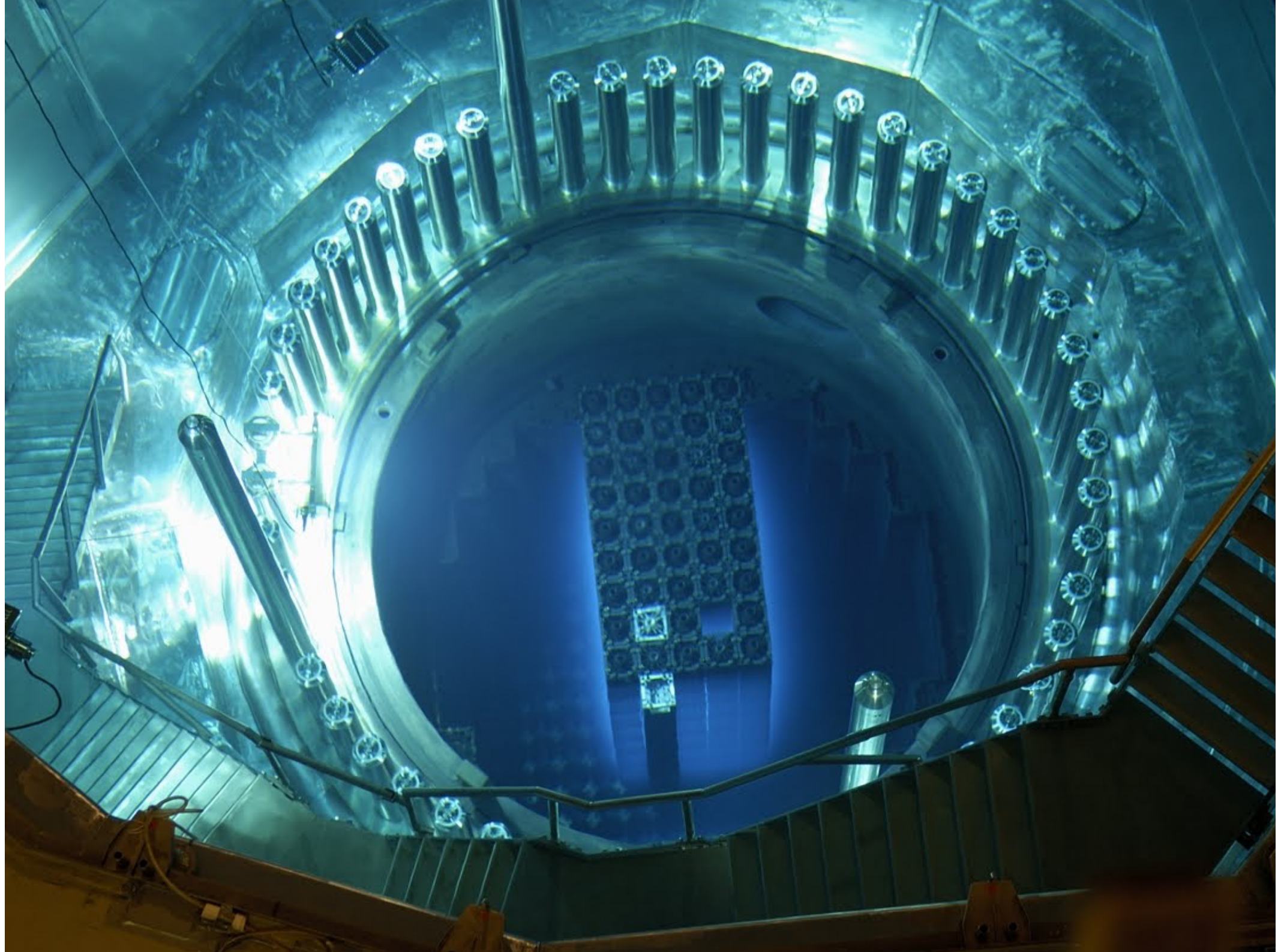
Blaž Zupan

University of Ljubljana, Slovenia & Baylor College of Medicine, Houston, USA



Völklingen Ironworks, Saarland, Germany








```
- def h(theta, x):  
    """Logistic function"""  
    return 1. / (1 + np.exp(-x.dot(theta)))  
  
- def grad_ascent(x, y, alpha=0.001, epochs=1000000):  
    """Gradient ascent."""  
    theta = np.zeros(x.shape[1]).T  
    for i in range(epochs):  
        theta += alpha * (y - h(theta, x)).dot(x)  
    return theta
```


Adoption of AI

(some) Knowledge

(access to the) Data

(a solvable, inspiring) Problem

Adoption of AI

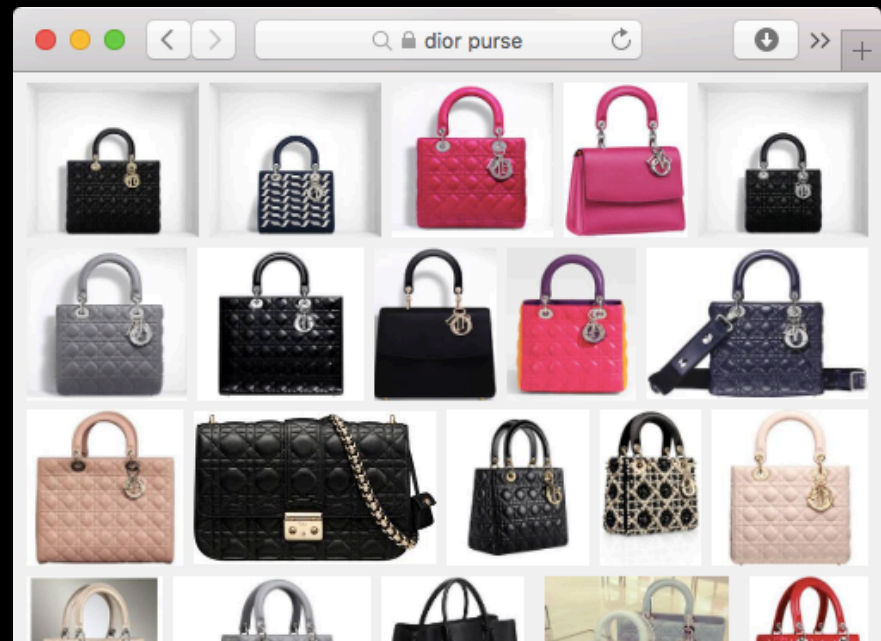
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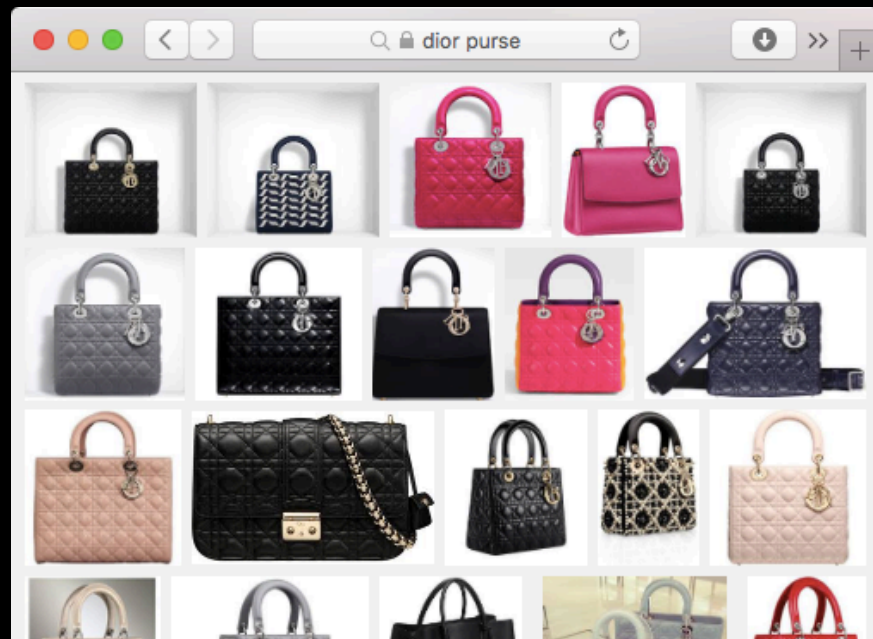
(access to the) Data

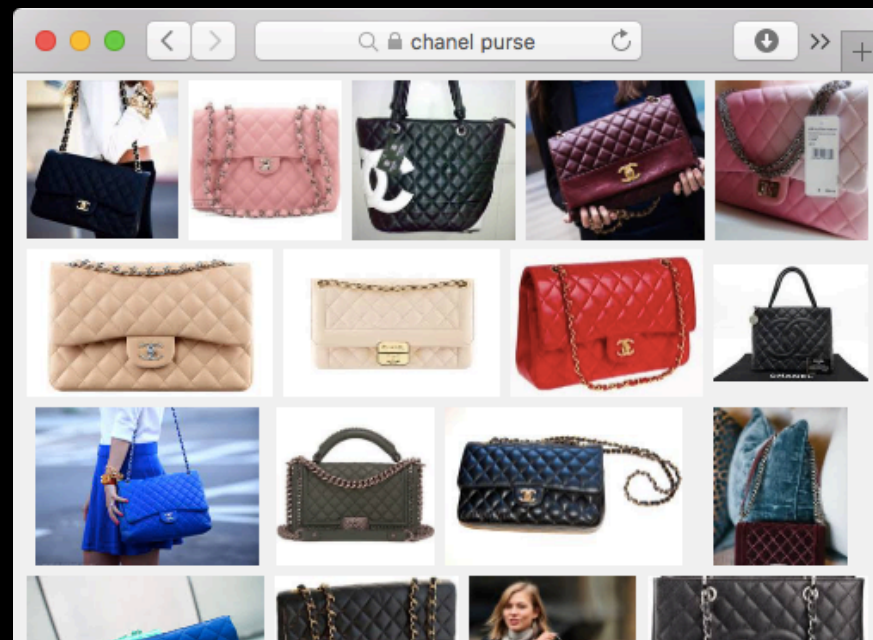
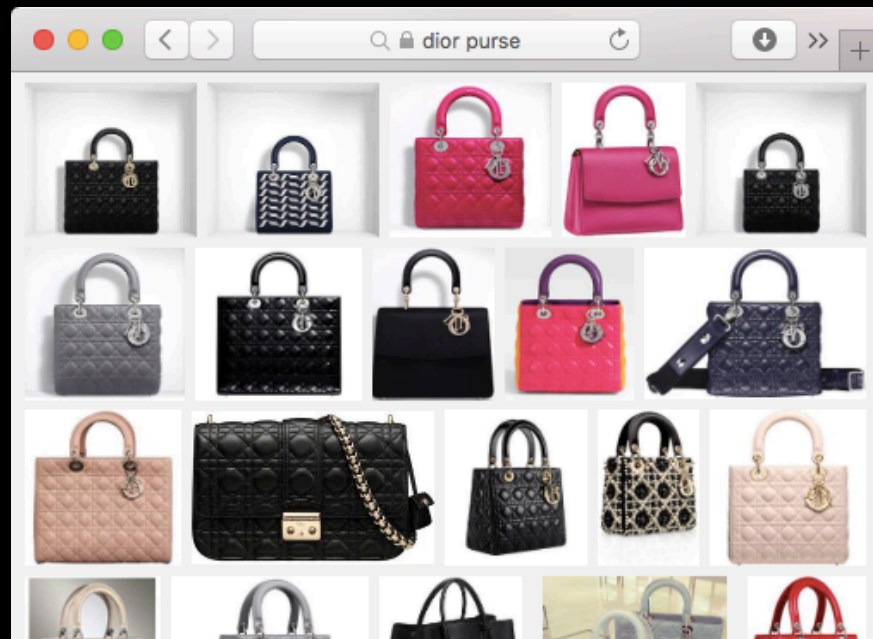
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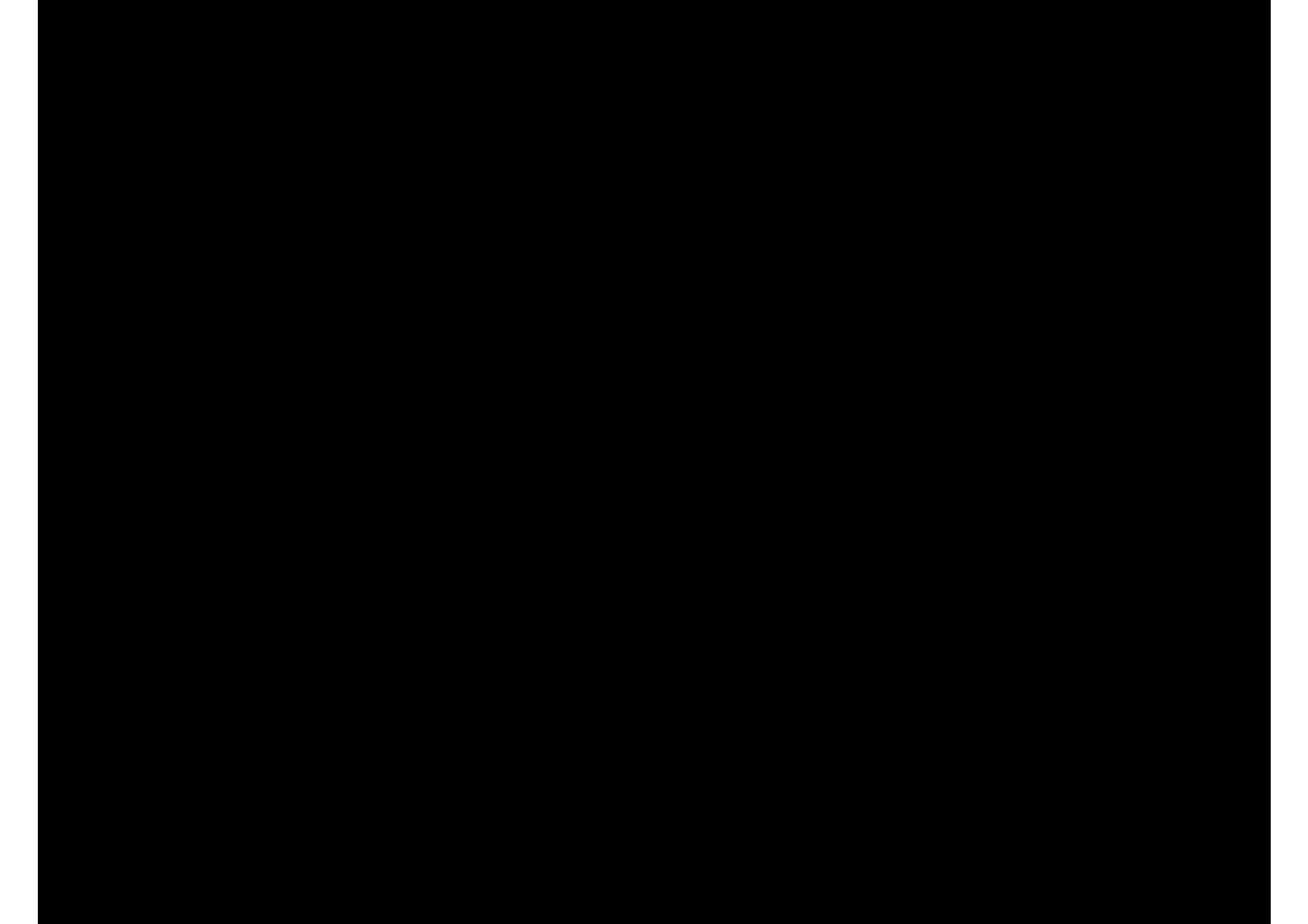












Concepts Covered in 15 min

Data representation

Distance estimation

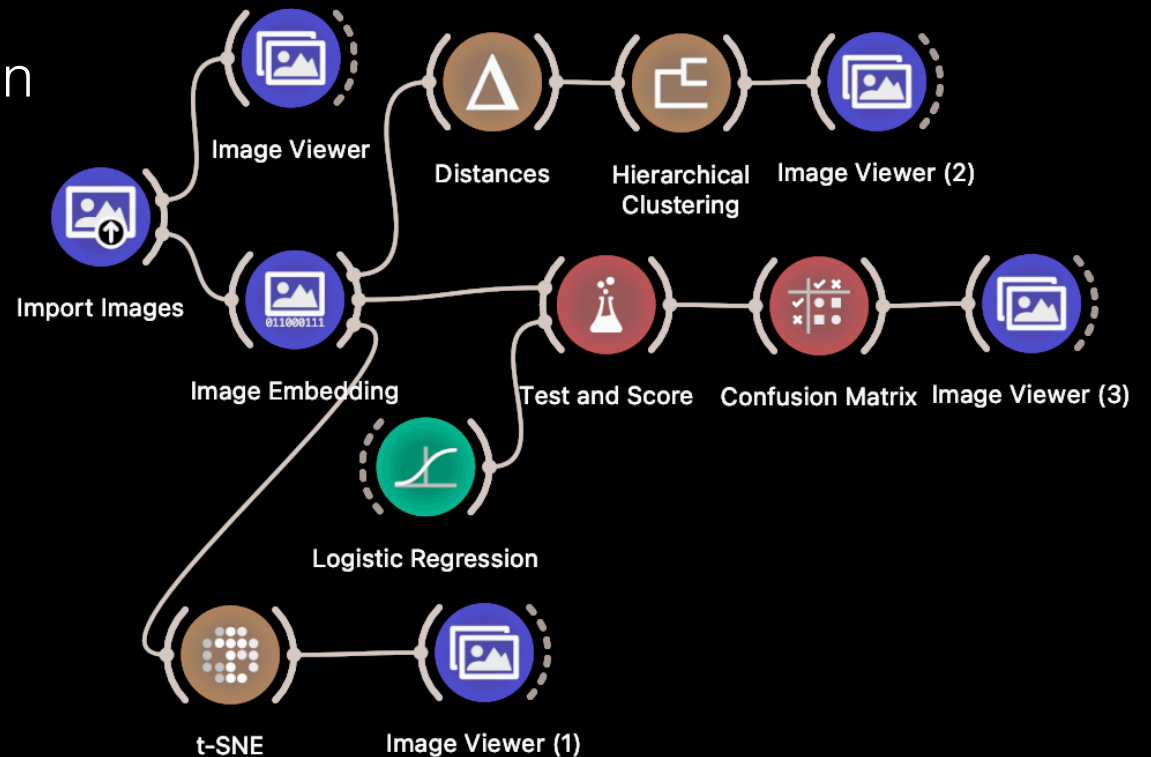
Clustering & Cluster explanation

Image embedding

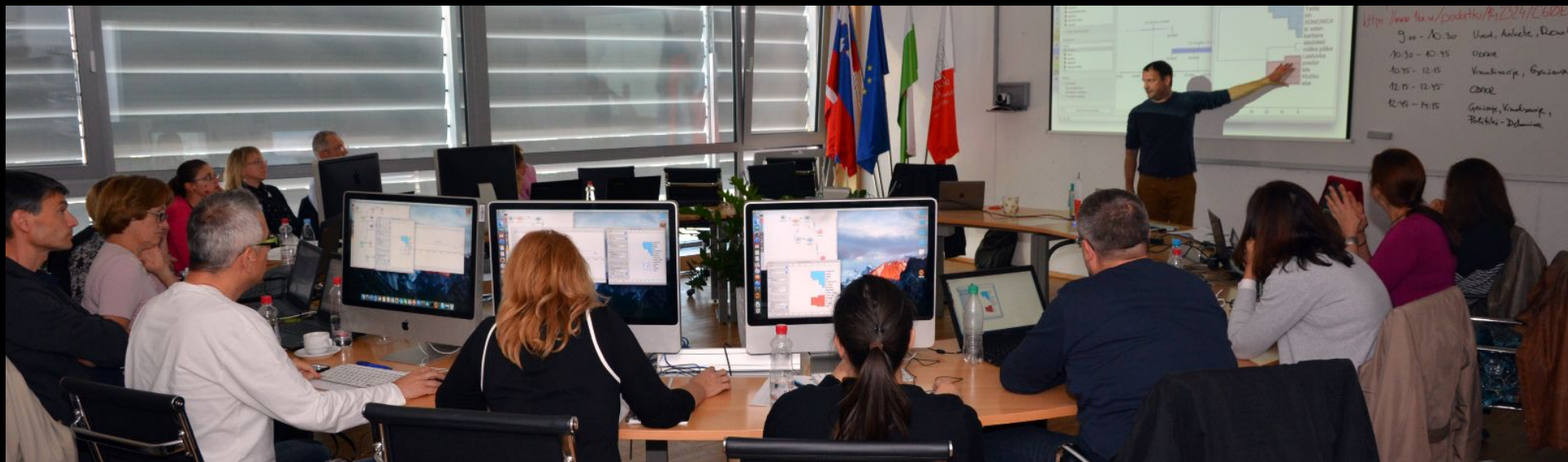
Classification Models

Classification

Accuracy estimation

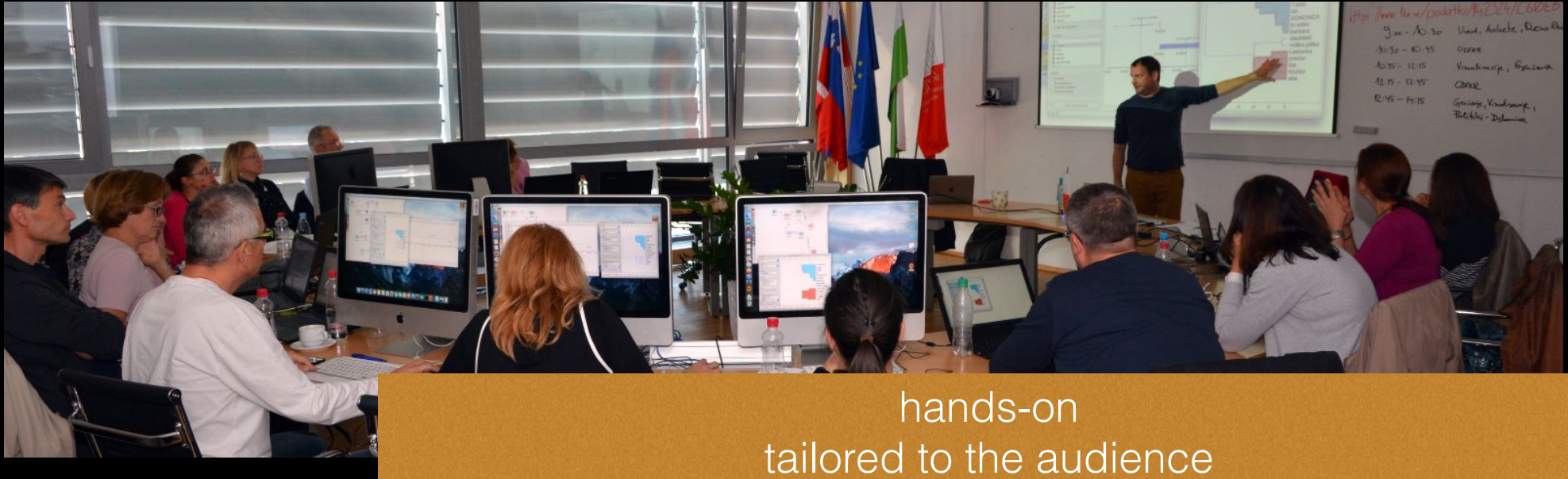


training of public administration



a workshop for telecomm agency

training of public administration



hands-on
tailored to the audience
problem solving, no powerpoints



a workshop for telecomm agency



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New In! AI Skills Needs Analysis

ARISA releases a comprehensive report on the most needed AI Skills and Roles in Europe

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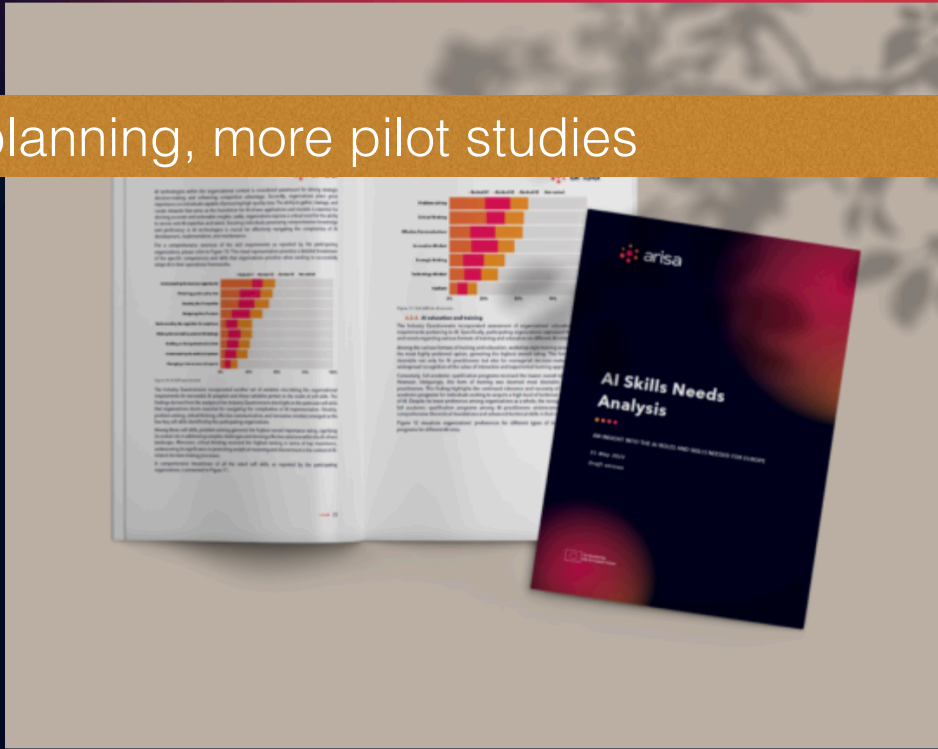
less planning, more pilot studies

ARISA releases a comprehensive report on the most needed AI Skills and Roles in Europe

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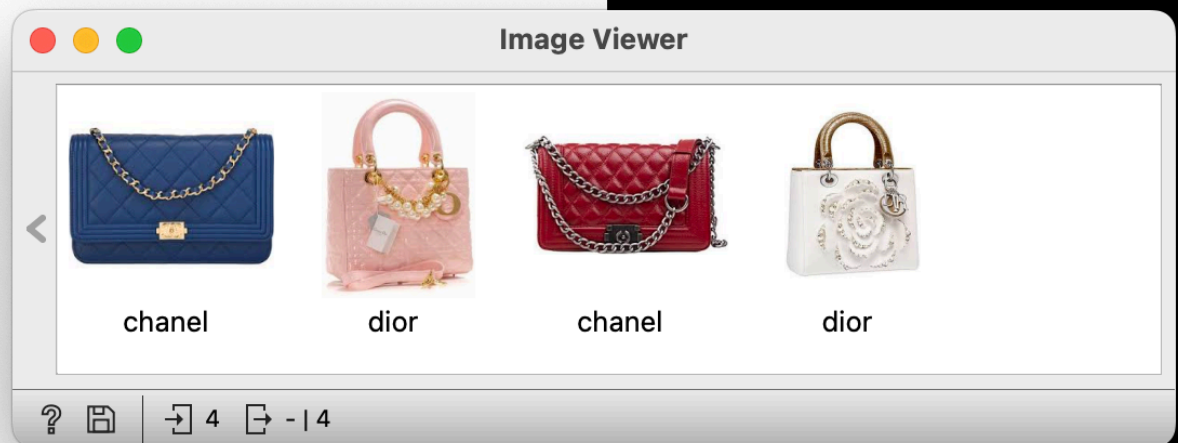


Adoption of AI

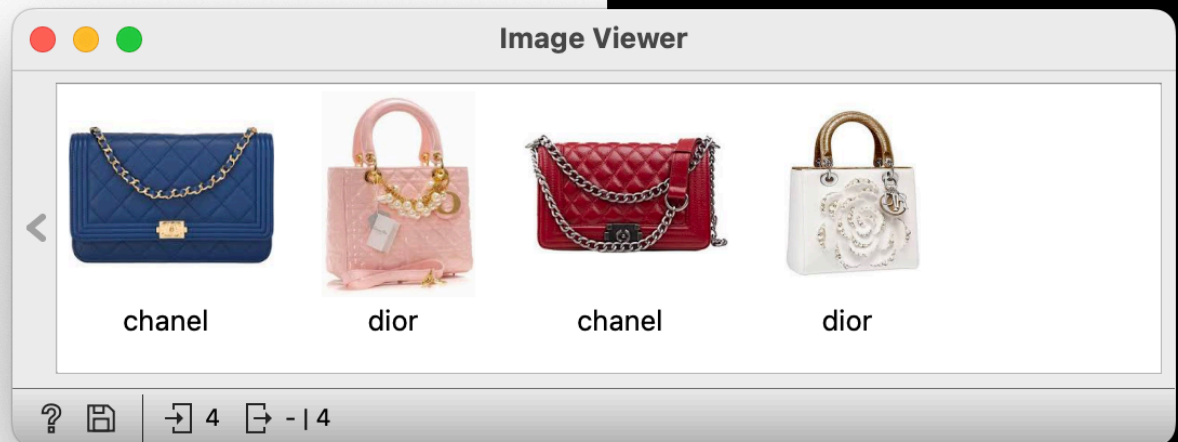
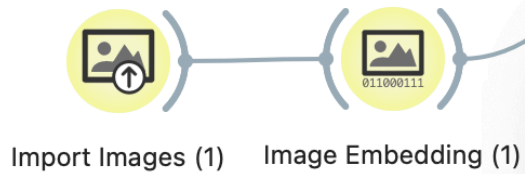
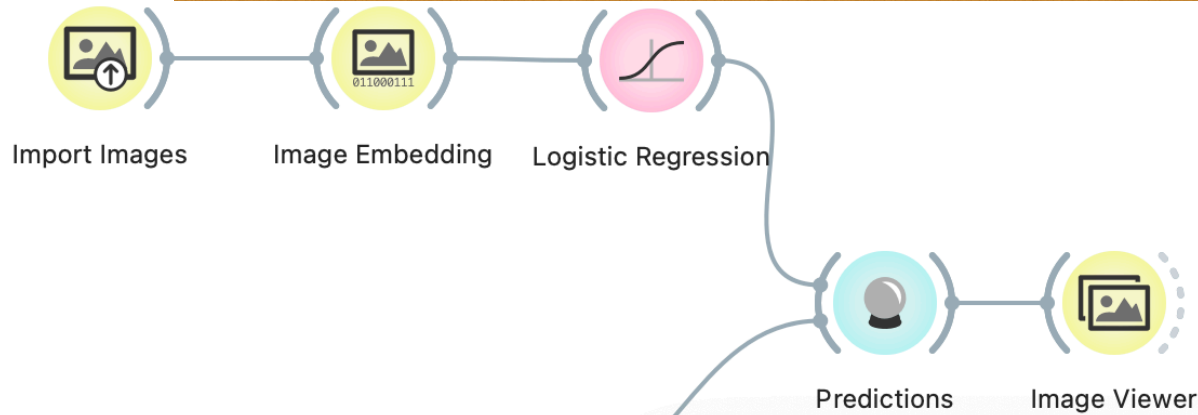
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(access to the) Data

(a solvable, inspiring) Problem

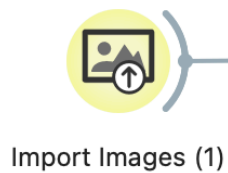
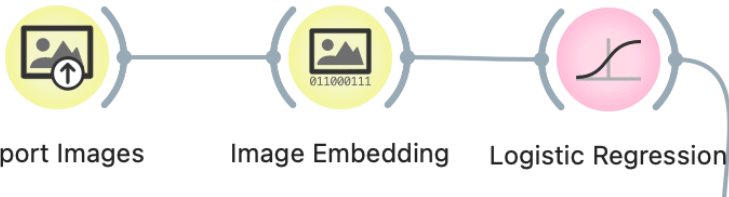


logistic regression is one of the simplest machine learning models

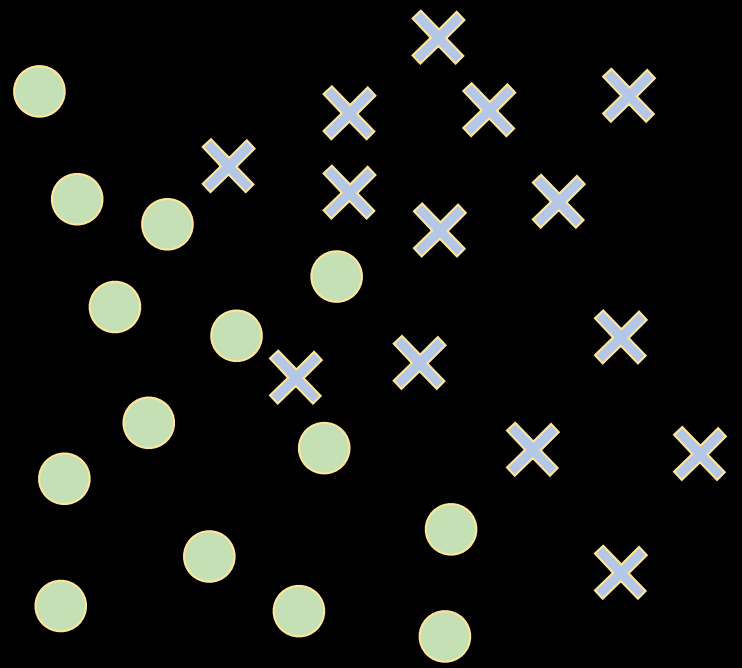


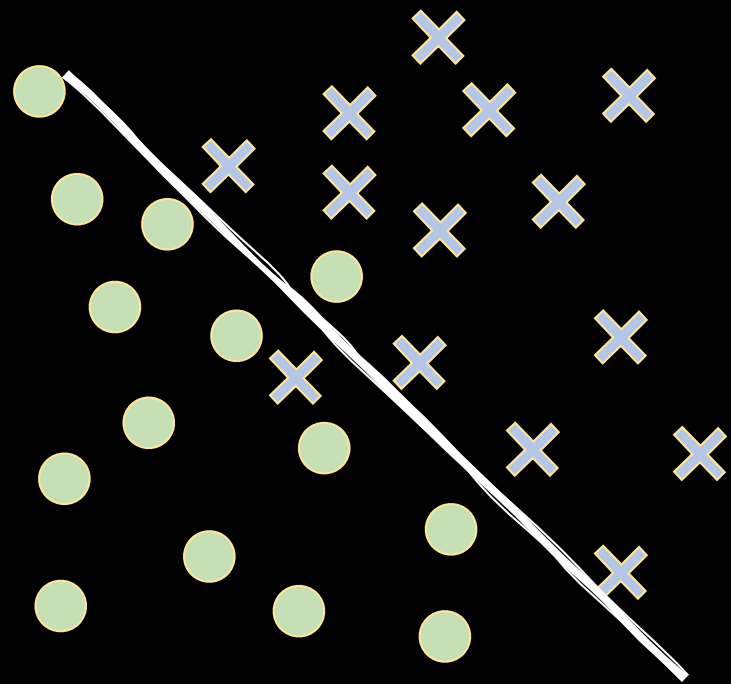
Untitled

logistic regression is one of the simplest machine learning models

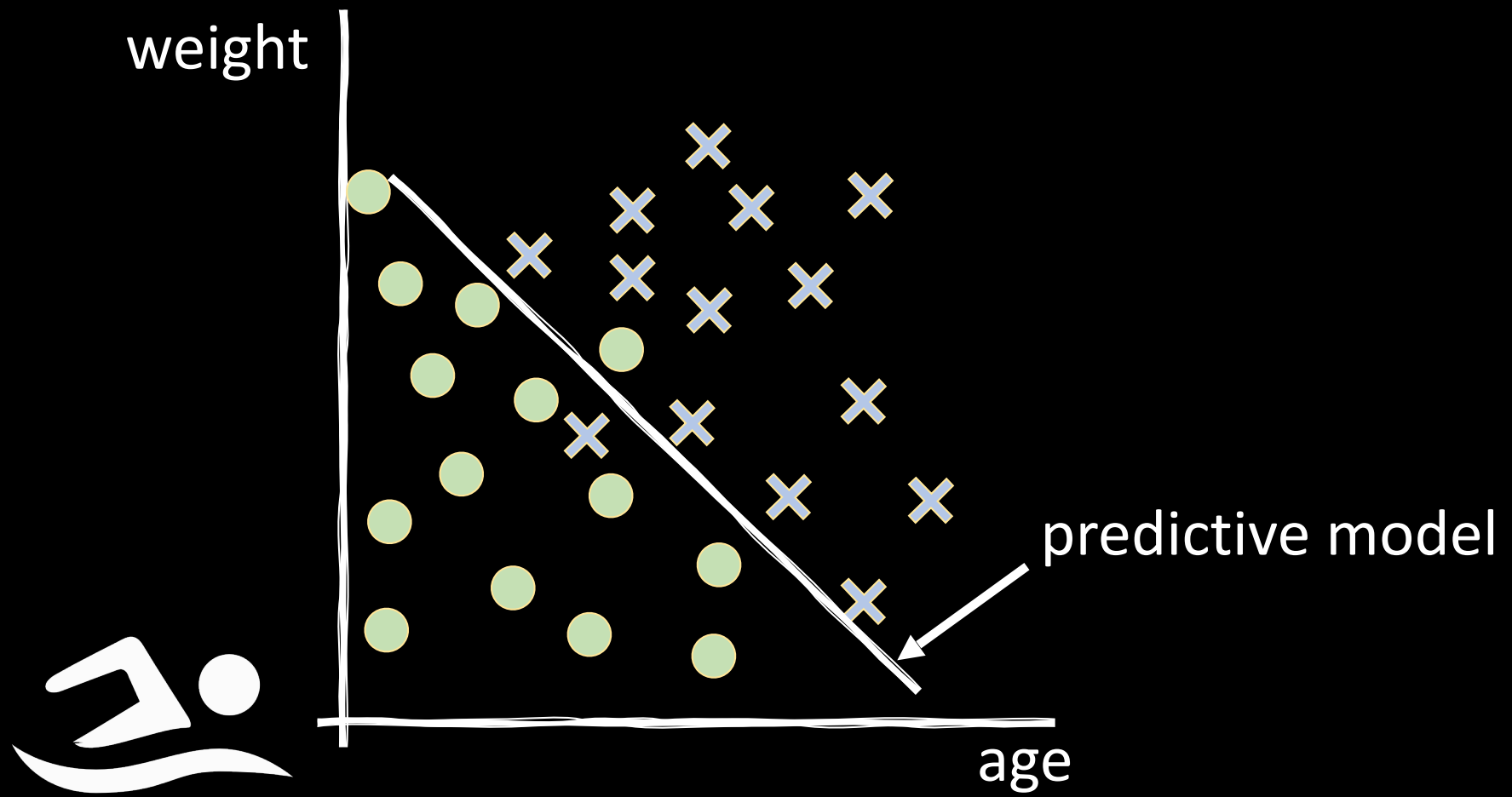


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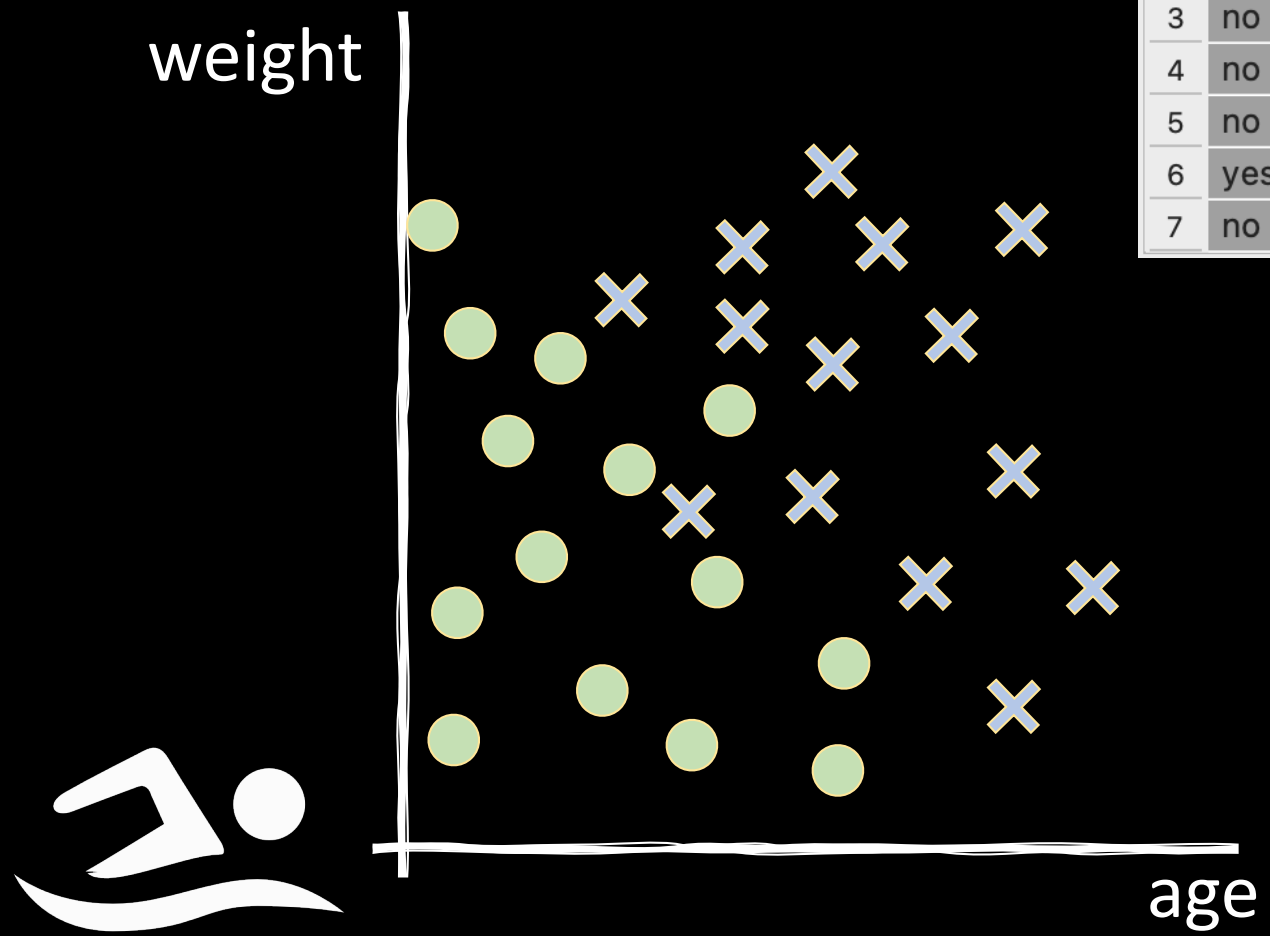
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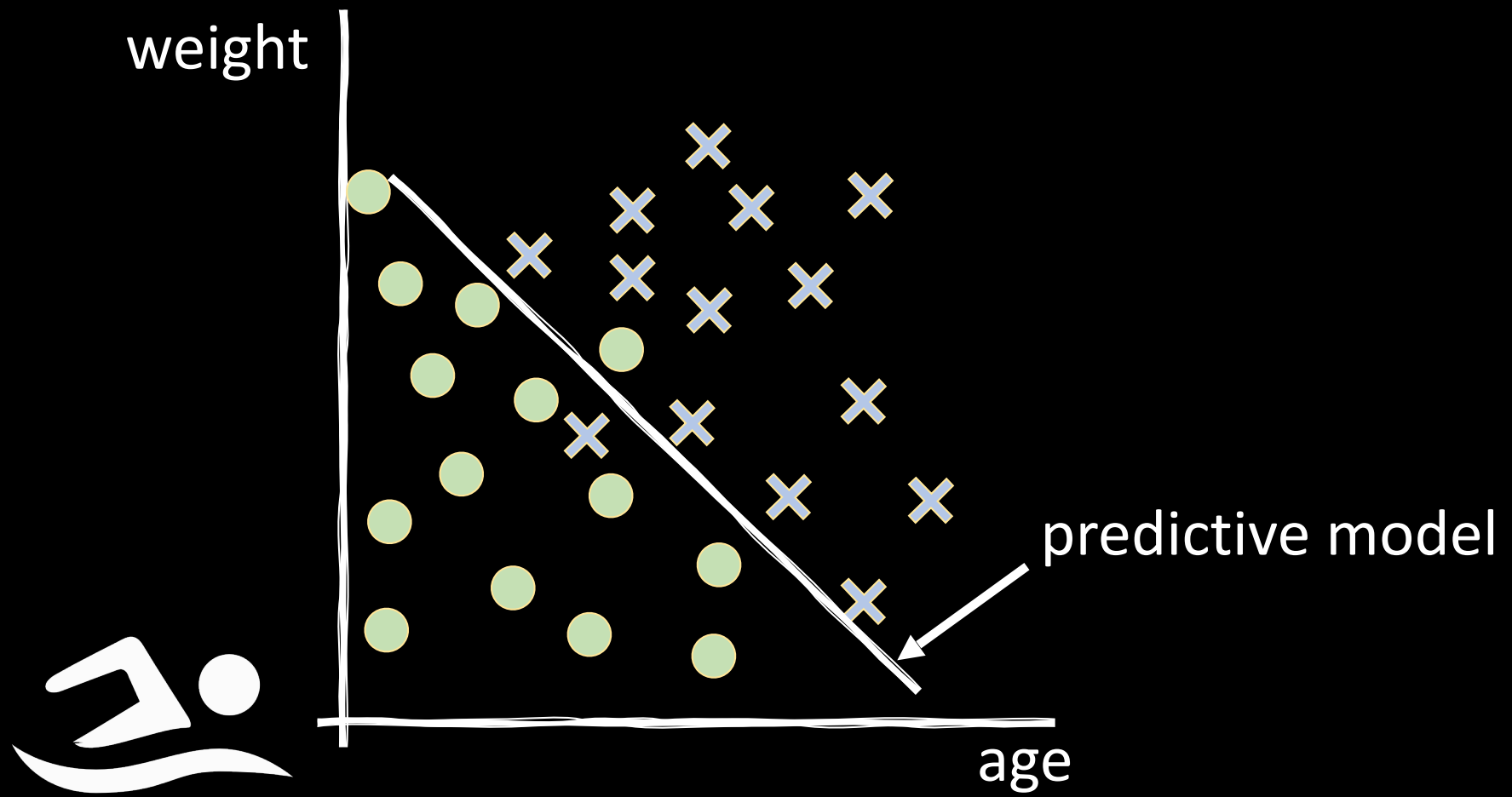
(access to the) Data

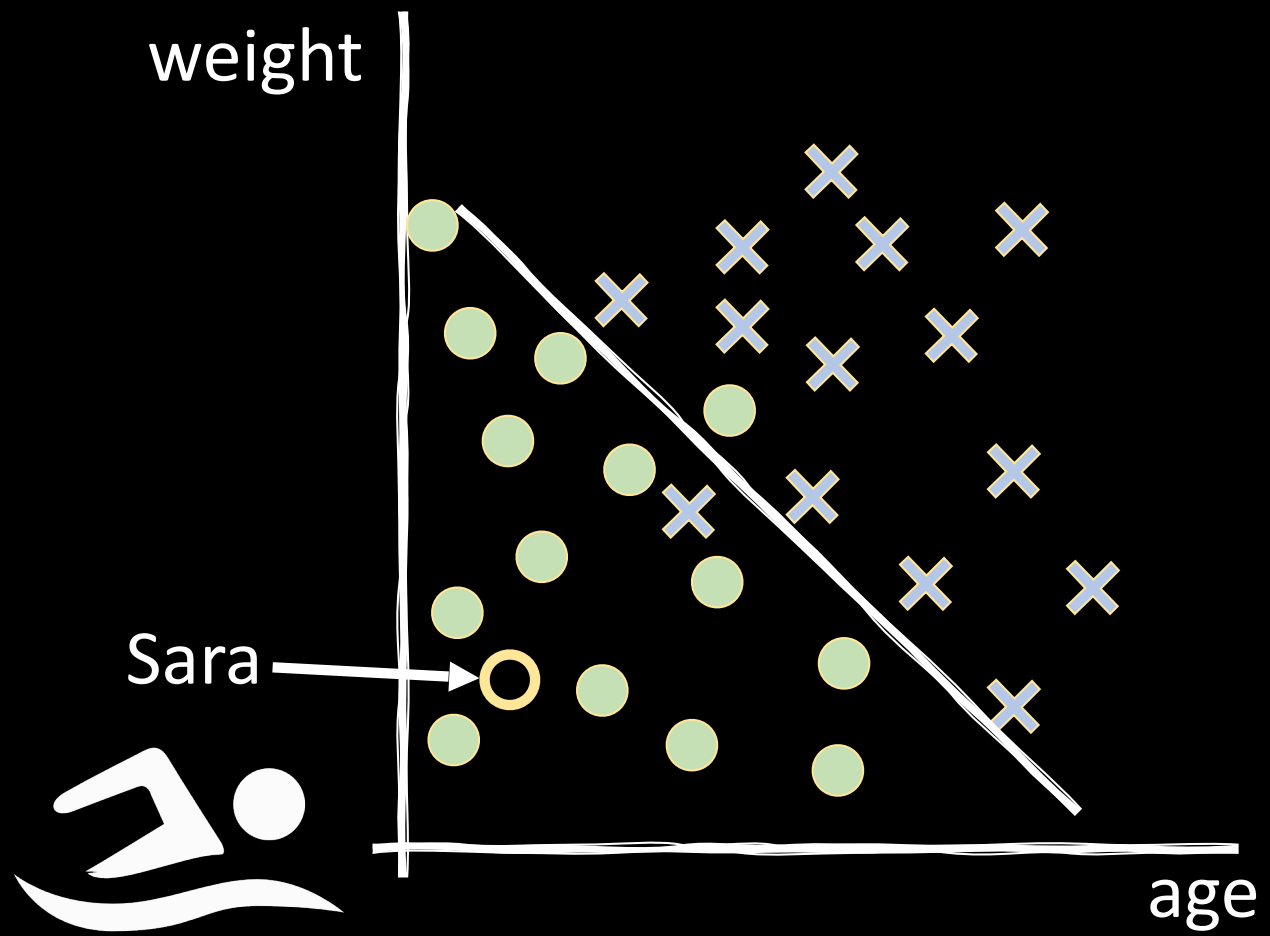
(a solvable, inspiring) Problem

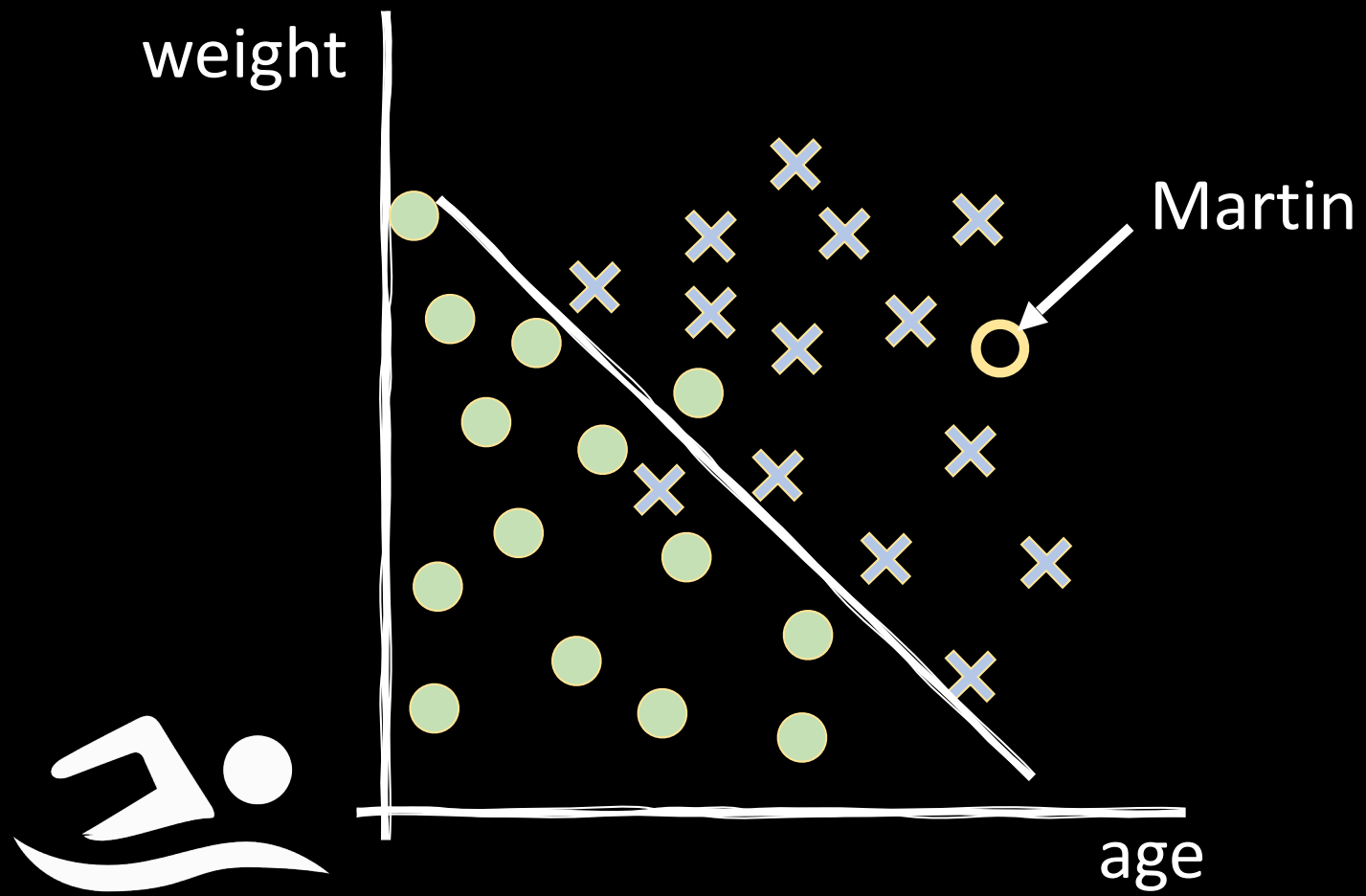
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1	yes	Jane	25	55
2	yes	Bill	55	70
3	no	John	34	85
4	no	Mary	75	65
5	no	Gill	71	75
6	yes	Susan	48	61
7	no	George	46	88



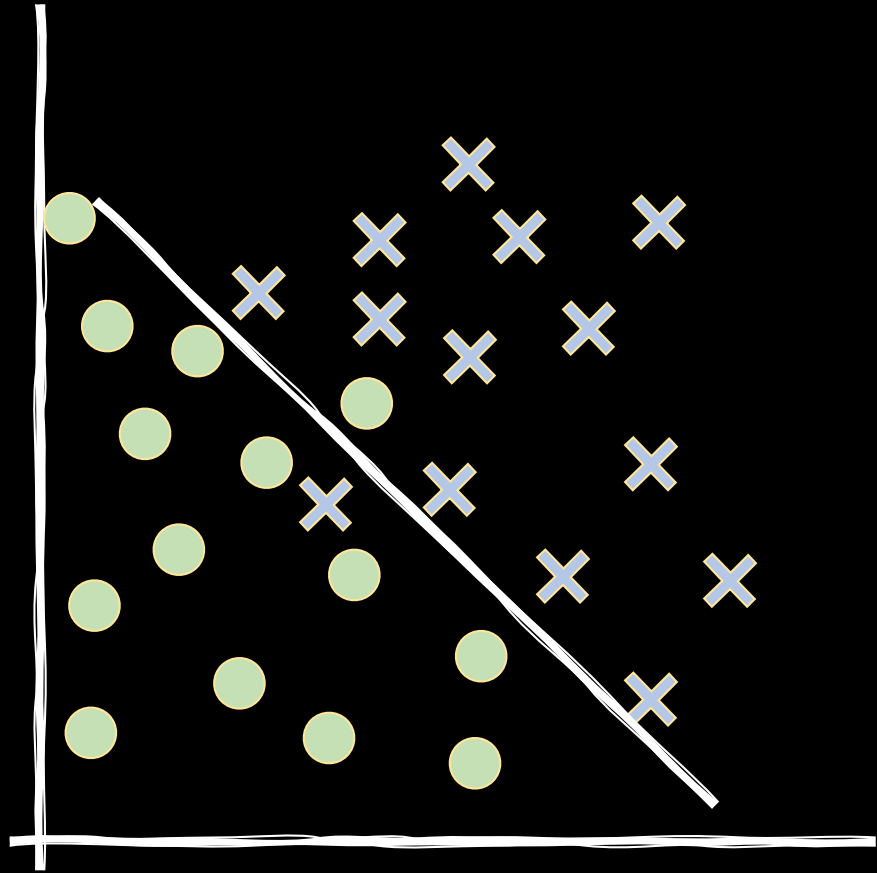
(AI is just numbers)







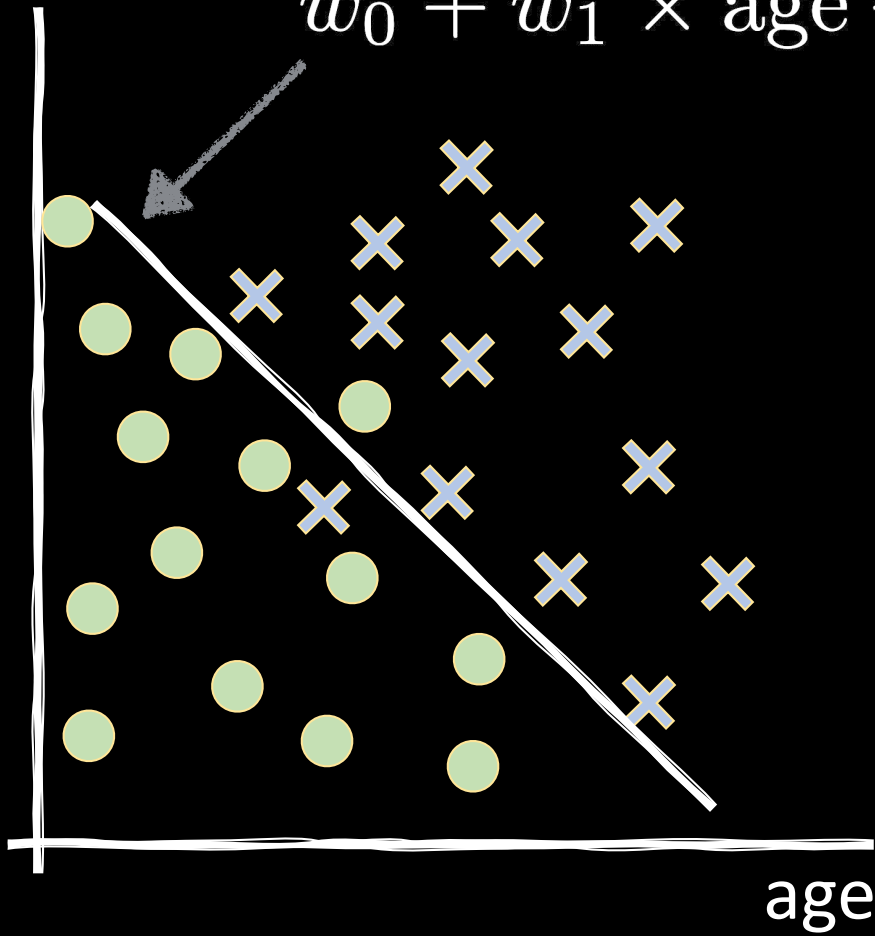
weight



age

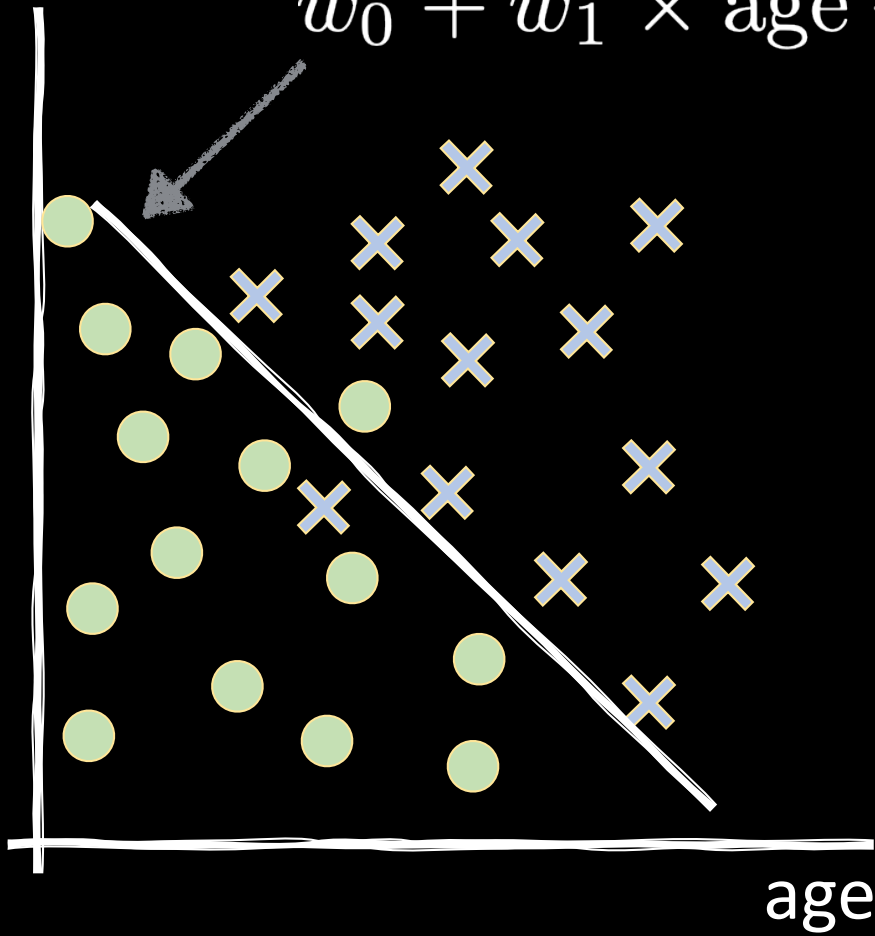
weight

$$w_0 + w_1 \times \text{age} + w_2 \times \text{weight} = 0$$



weight

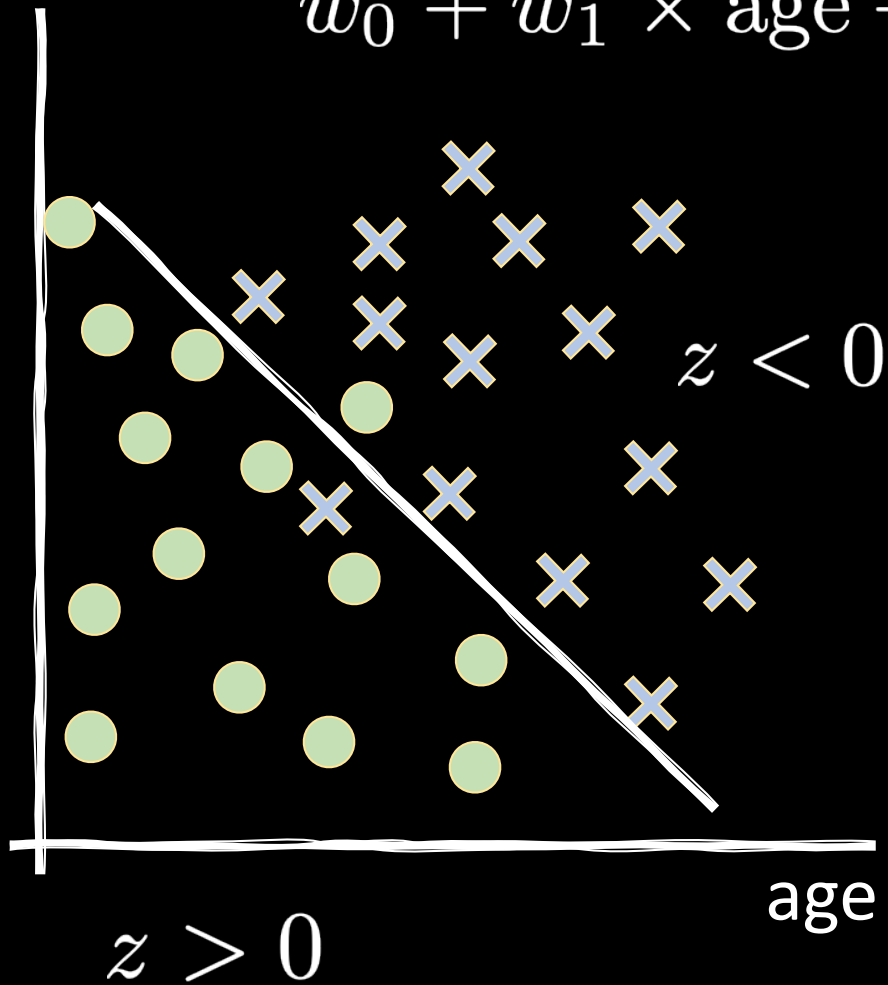
$$w_0 + w_1 \times \text{age} + w_2 \times \text{weight} = z$$



distance to "the line"

weight

$$w_0 + w_1 \times \text{age} + w_2 \times \text{weight} = z$$



$z < 0$

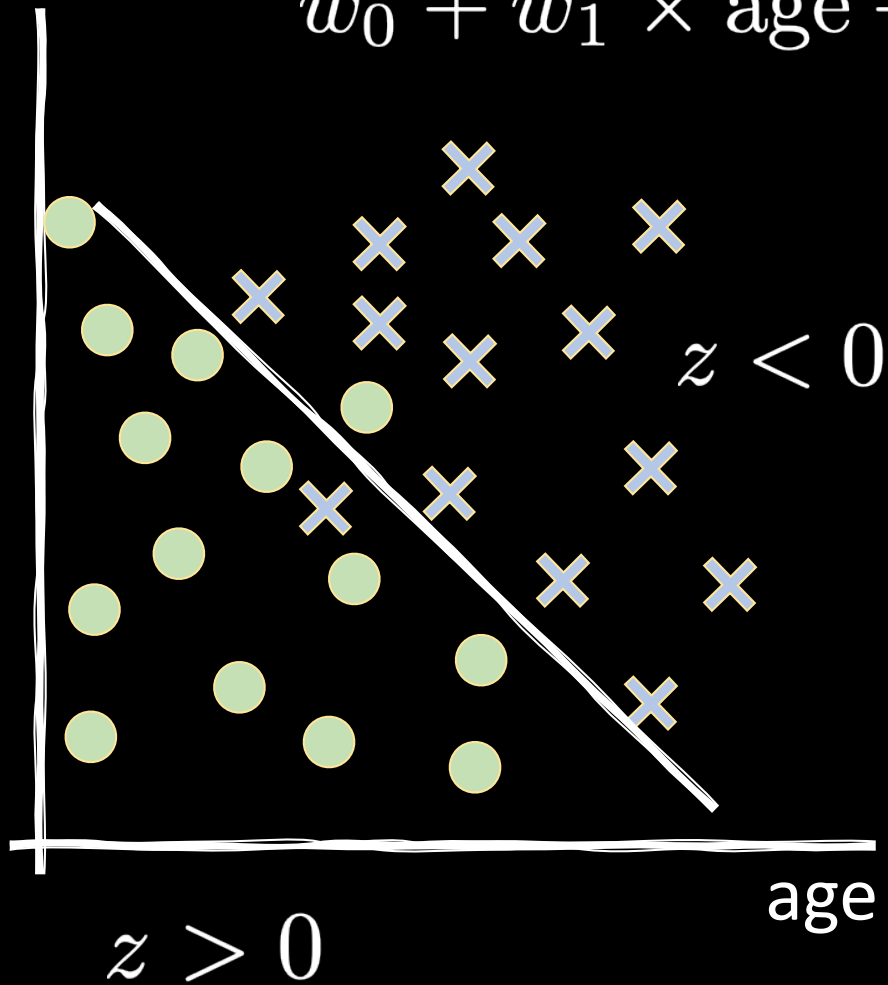
$z > 0$

age

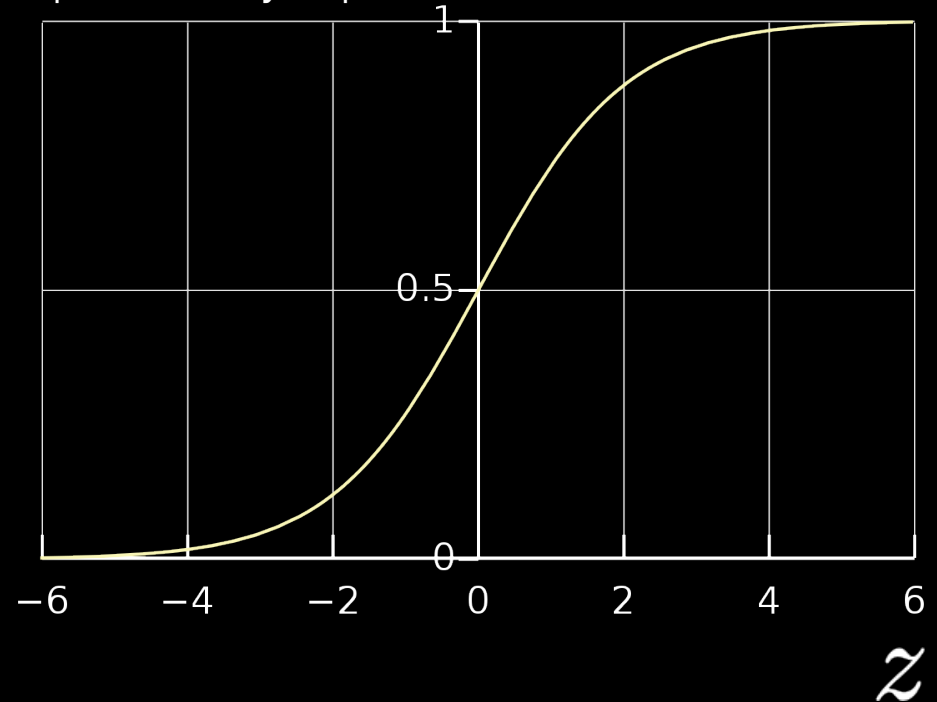
distance to "the line"

weight

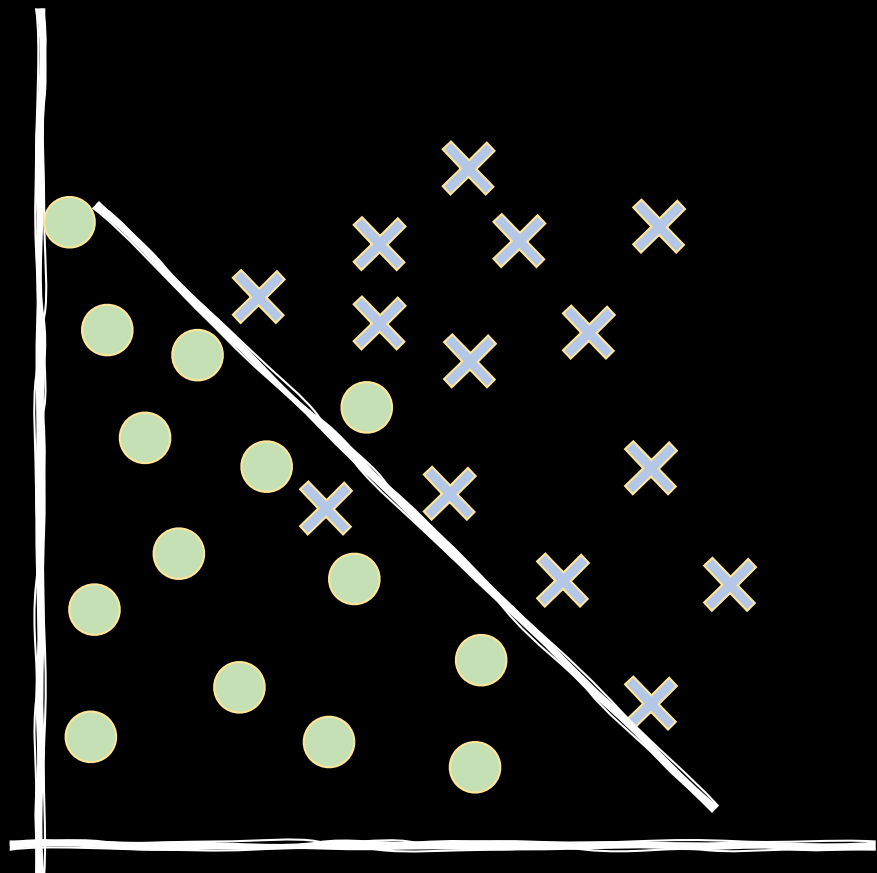
$$w_0 + w_1 \times \text{age} + w_2 \times \text{weight} = z$$



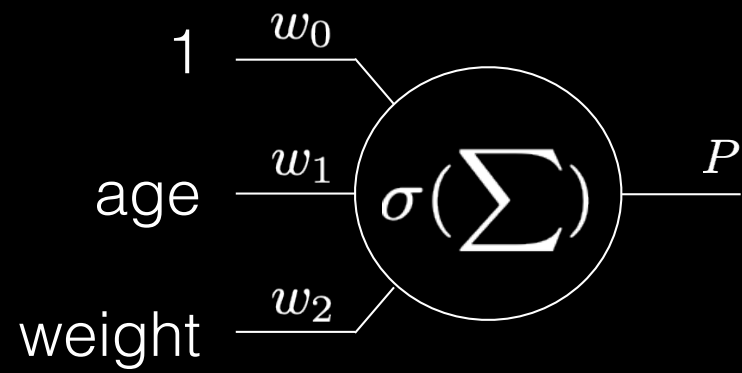
probability a person swims to lake Bled



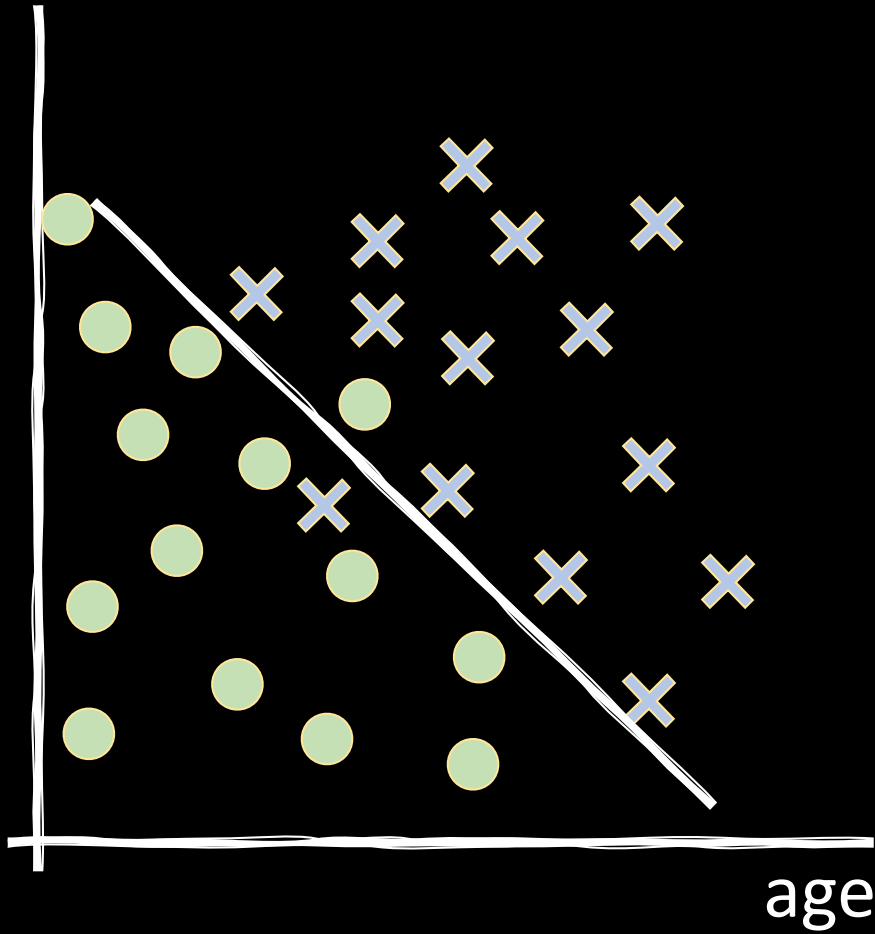
weight



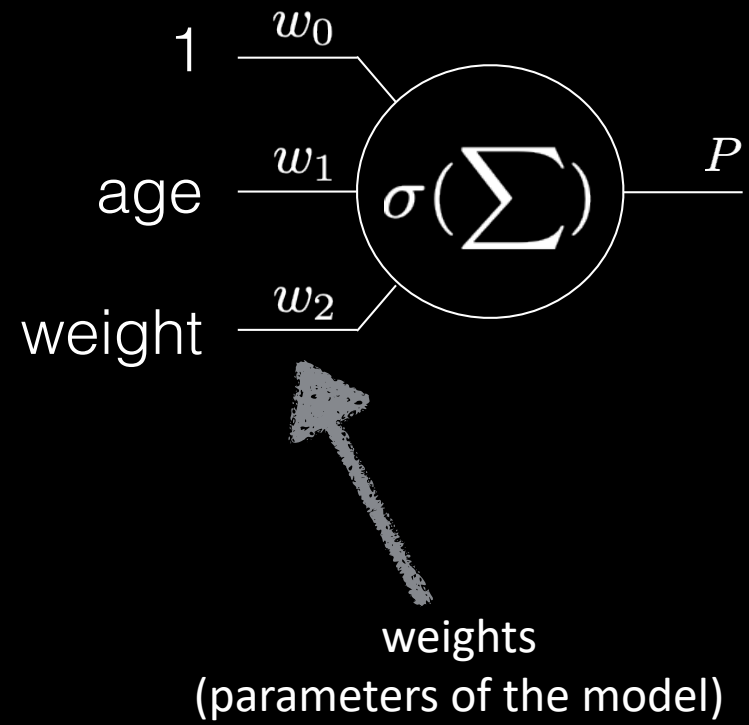
age

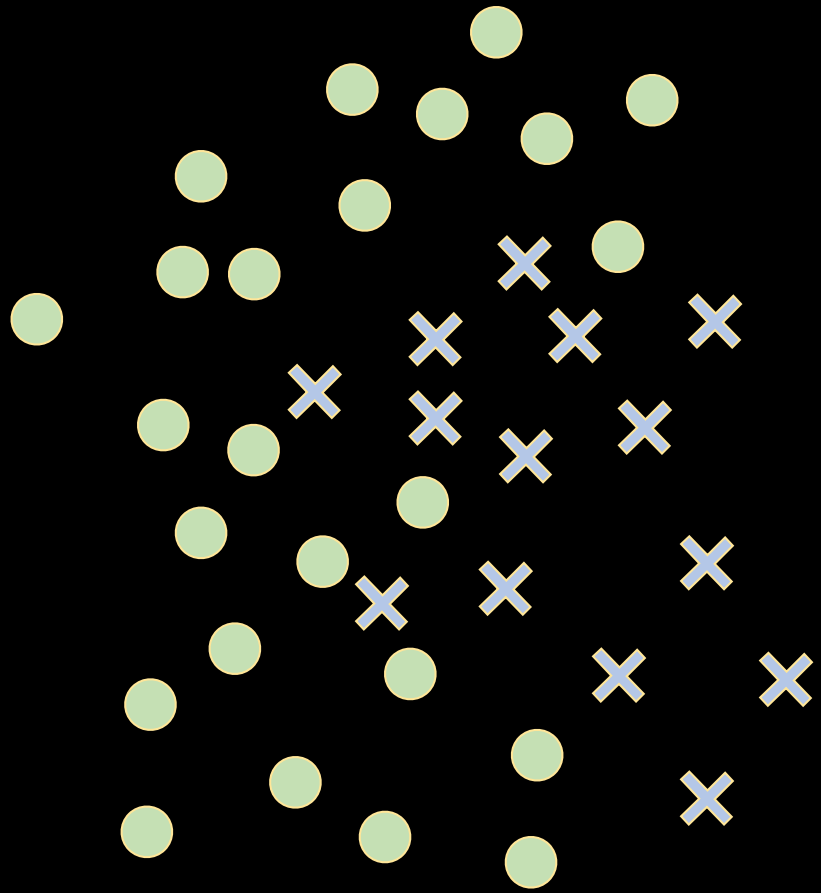


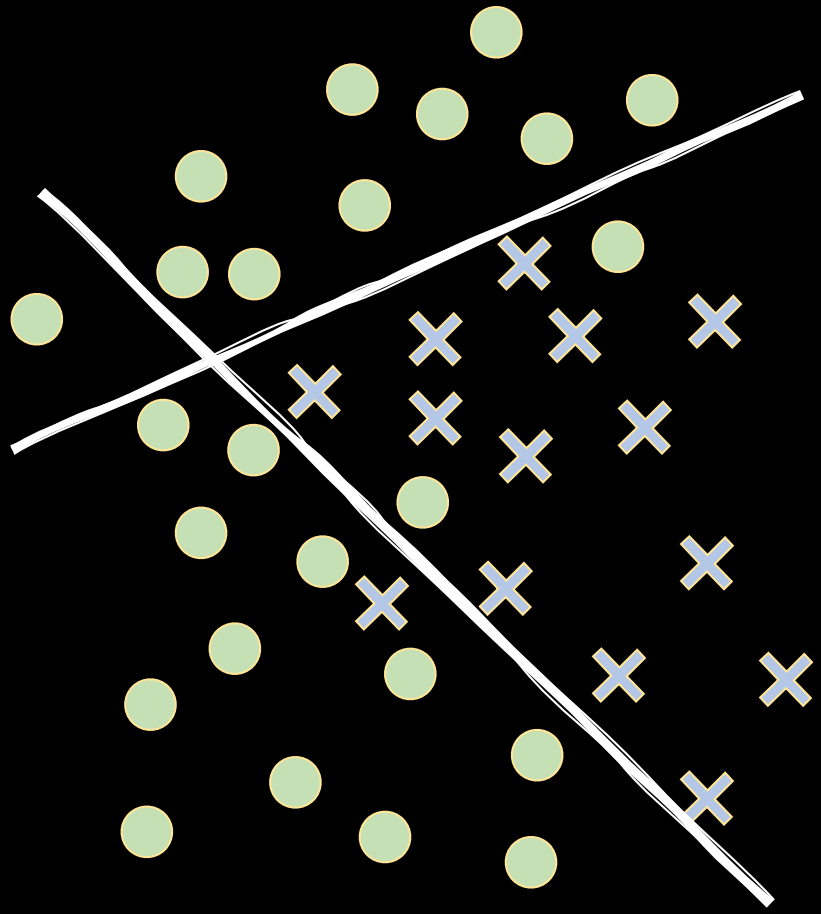
weight

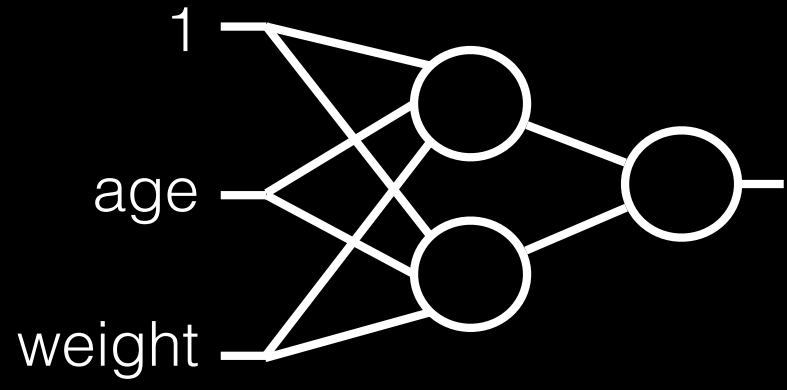
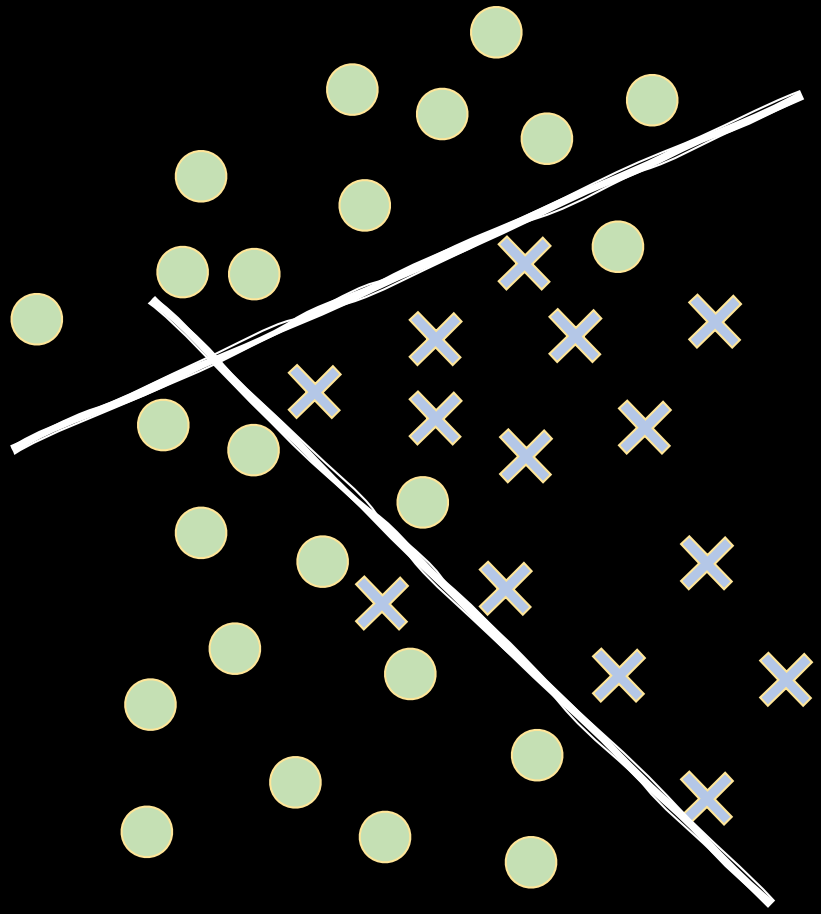


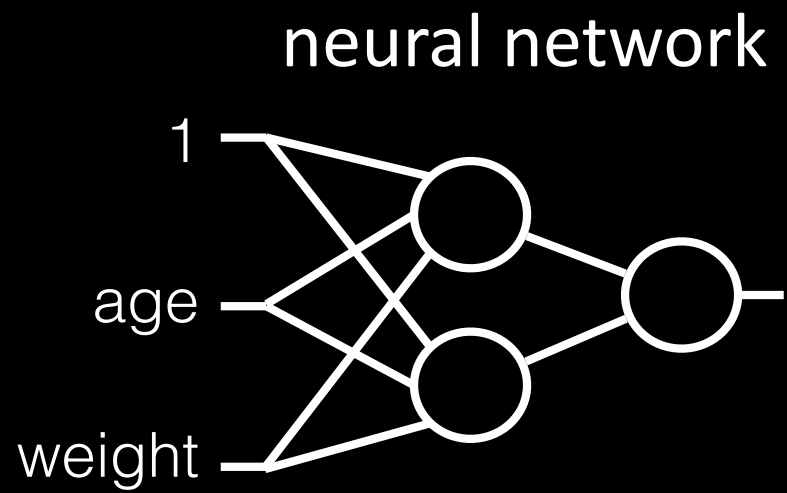
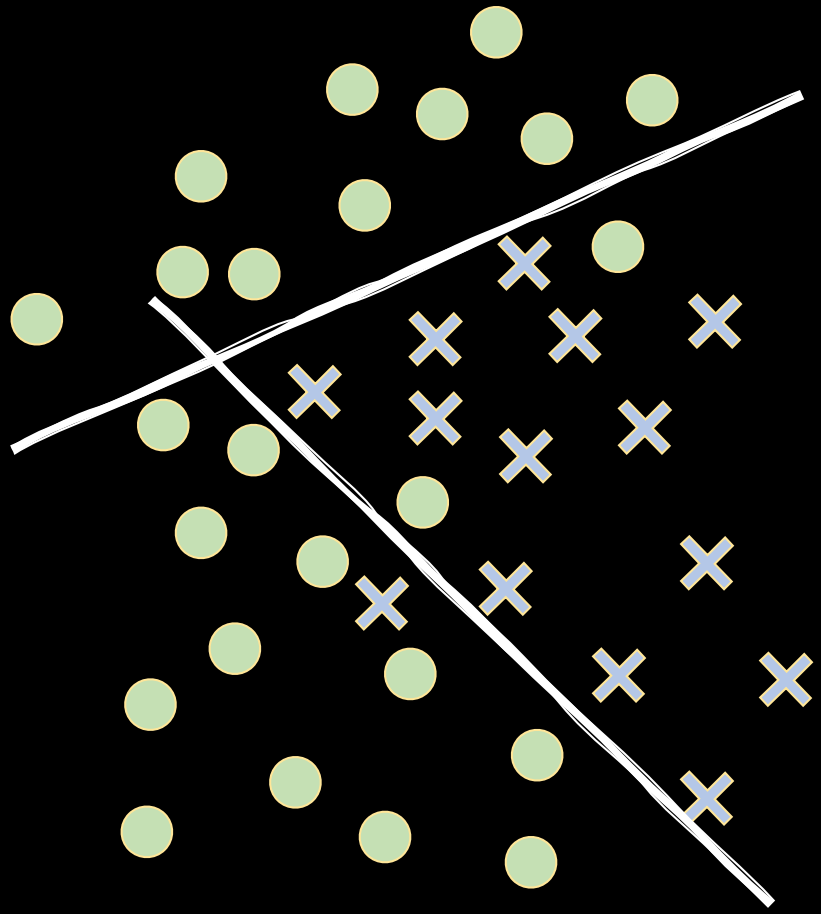
logistic regression

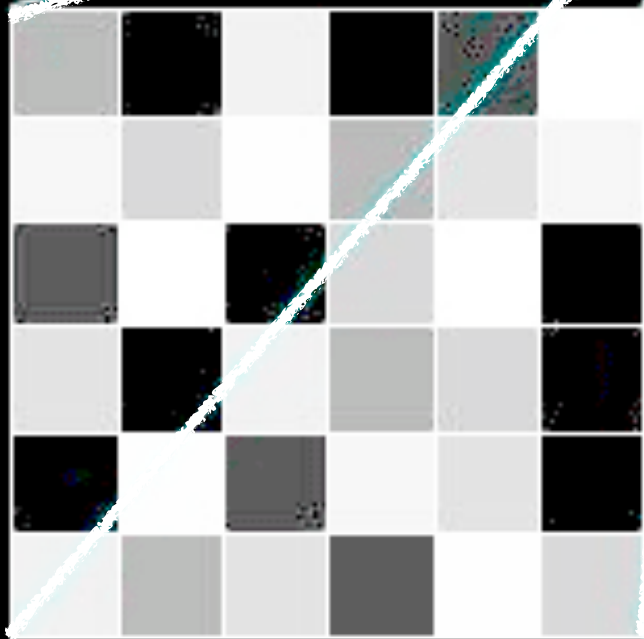








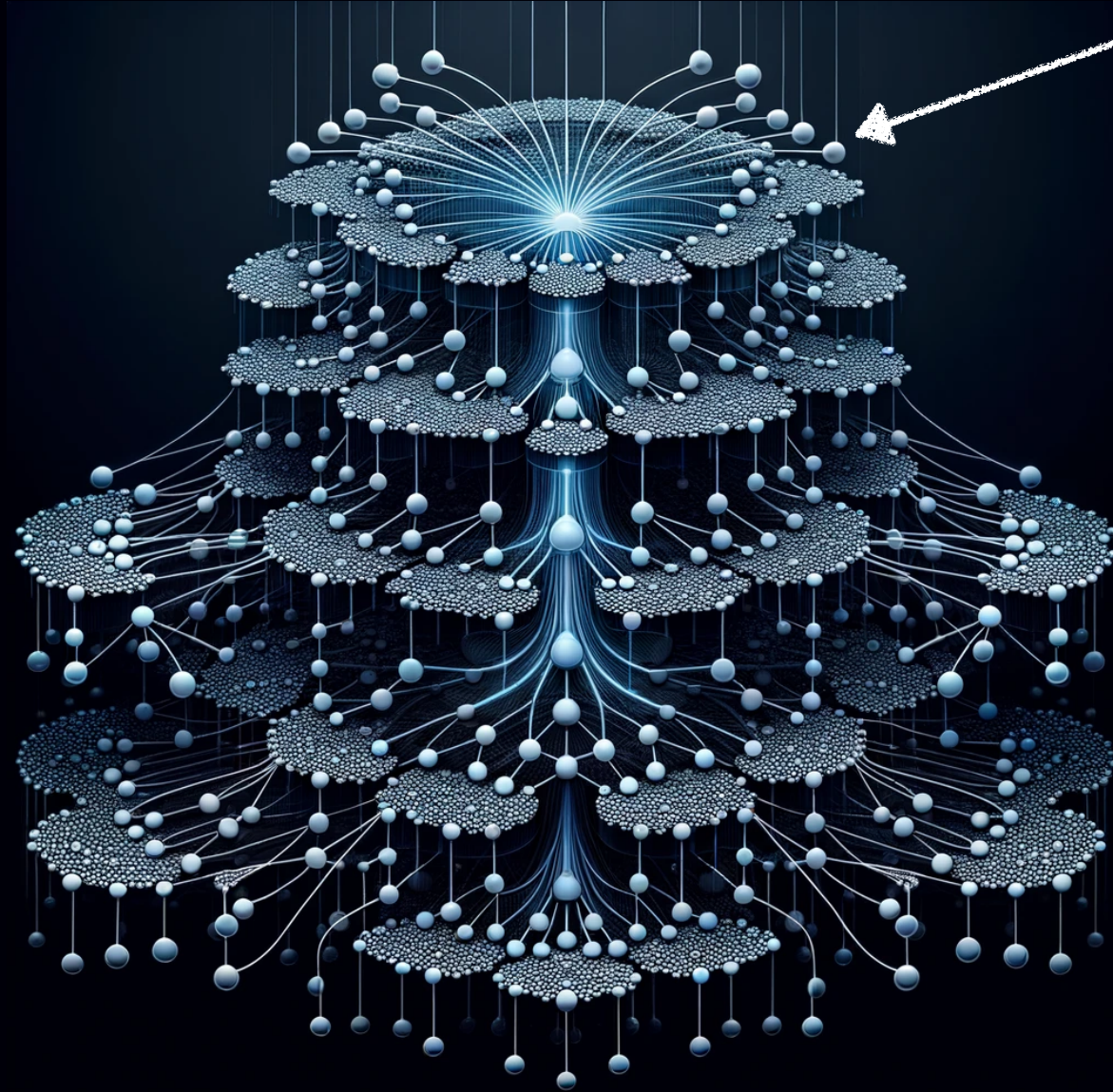




170	238	85	255	221	0
68	136	17	170	119	68
221	0	238	136	0	255
119	255	85	170	136	238
238	17	221	68	119	255
85	170	119	221	17	136

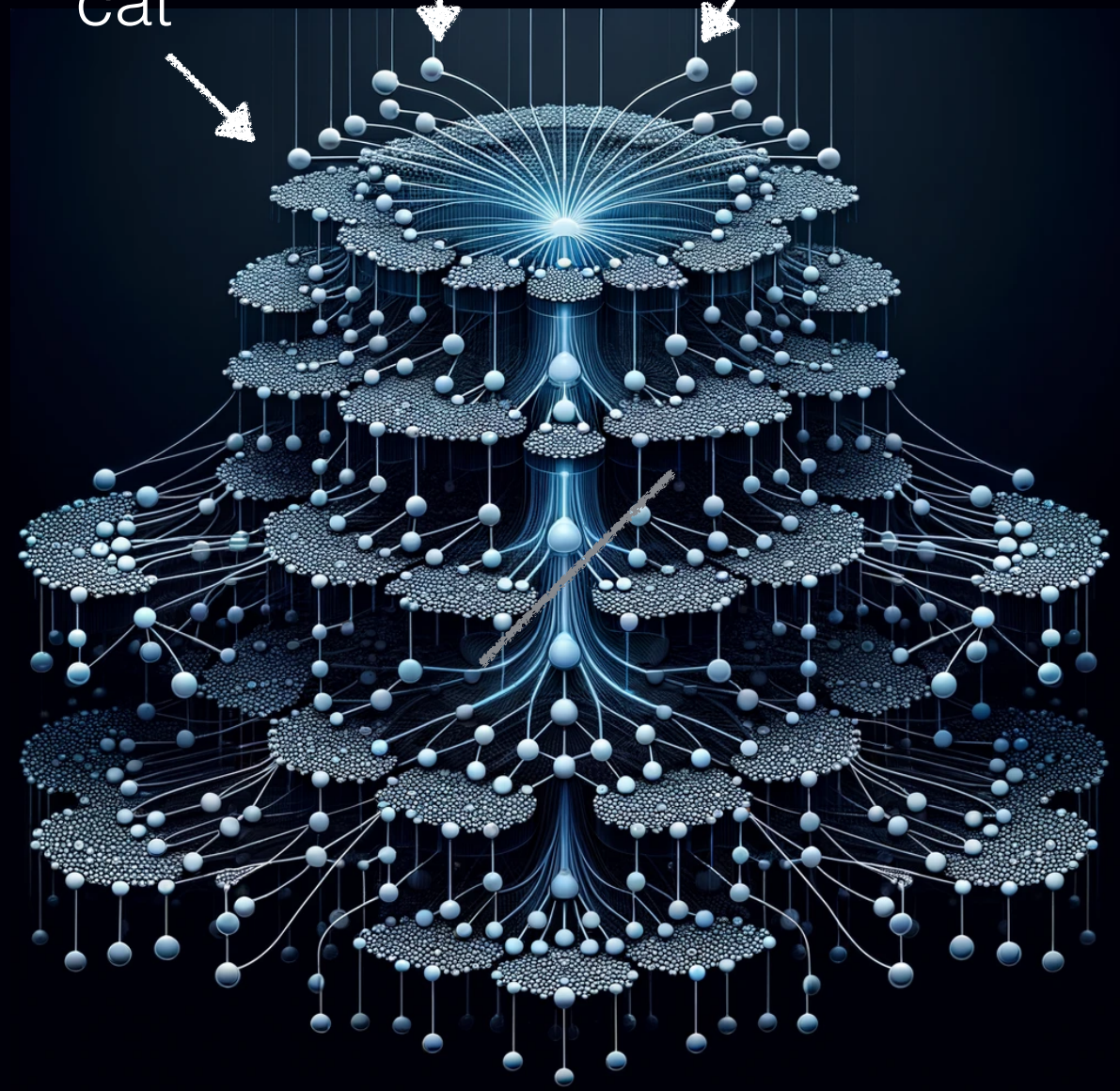
output (classification)

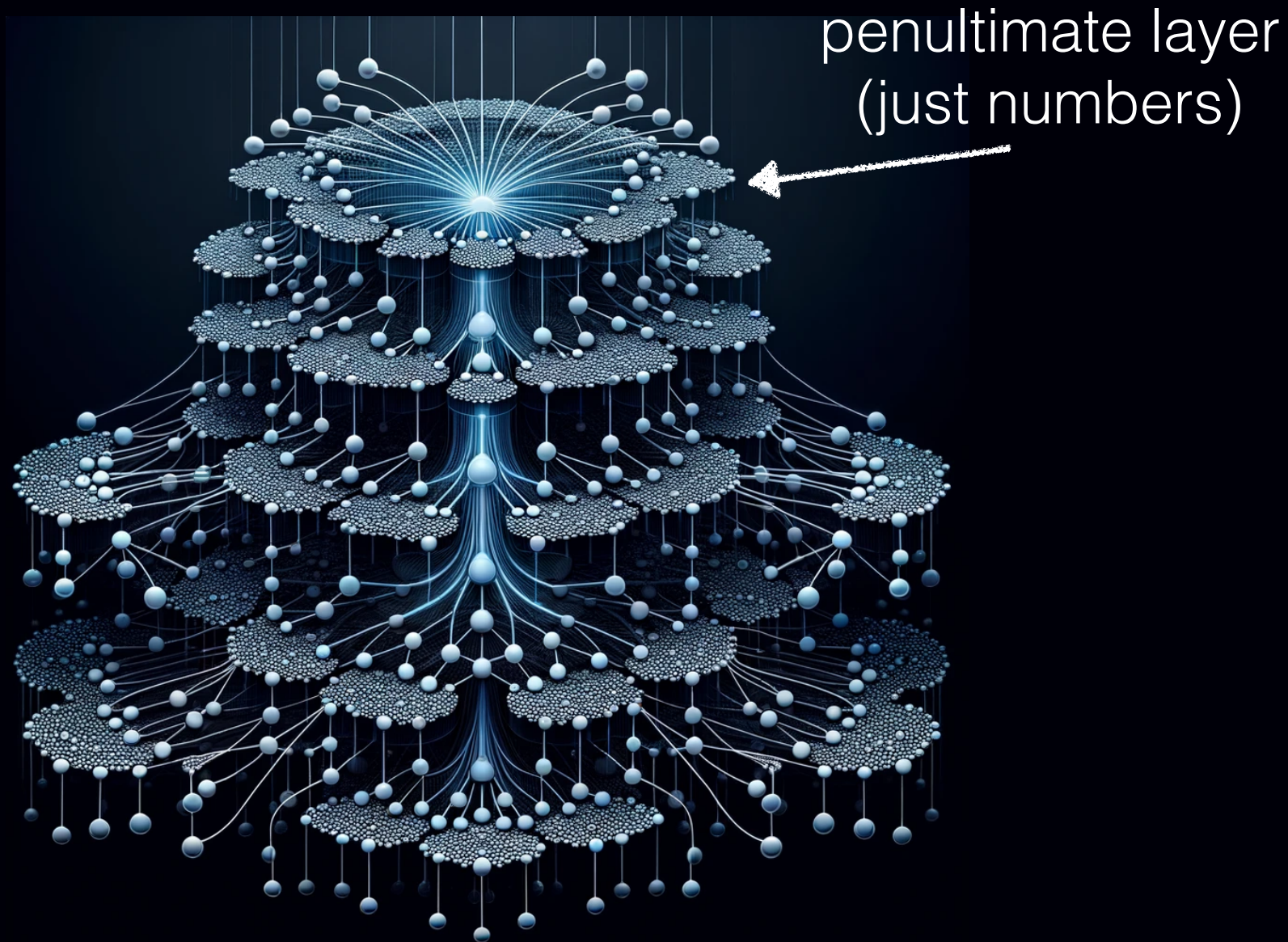
Luka



input (numbers)

cat dog basketball player





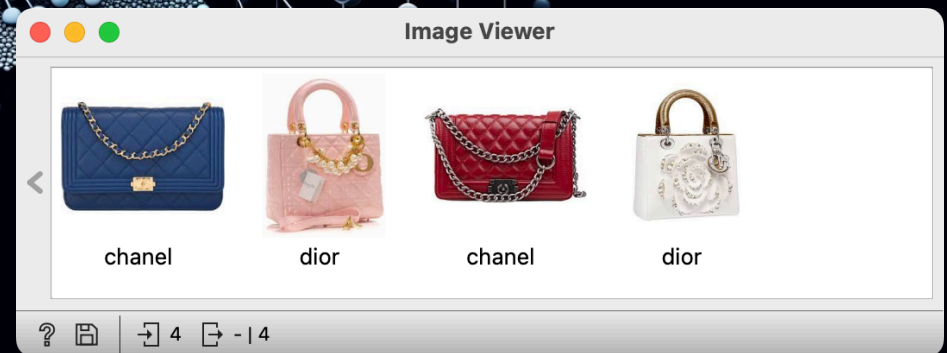
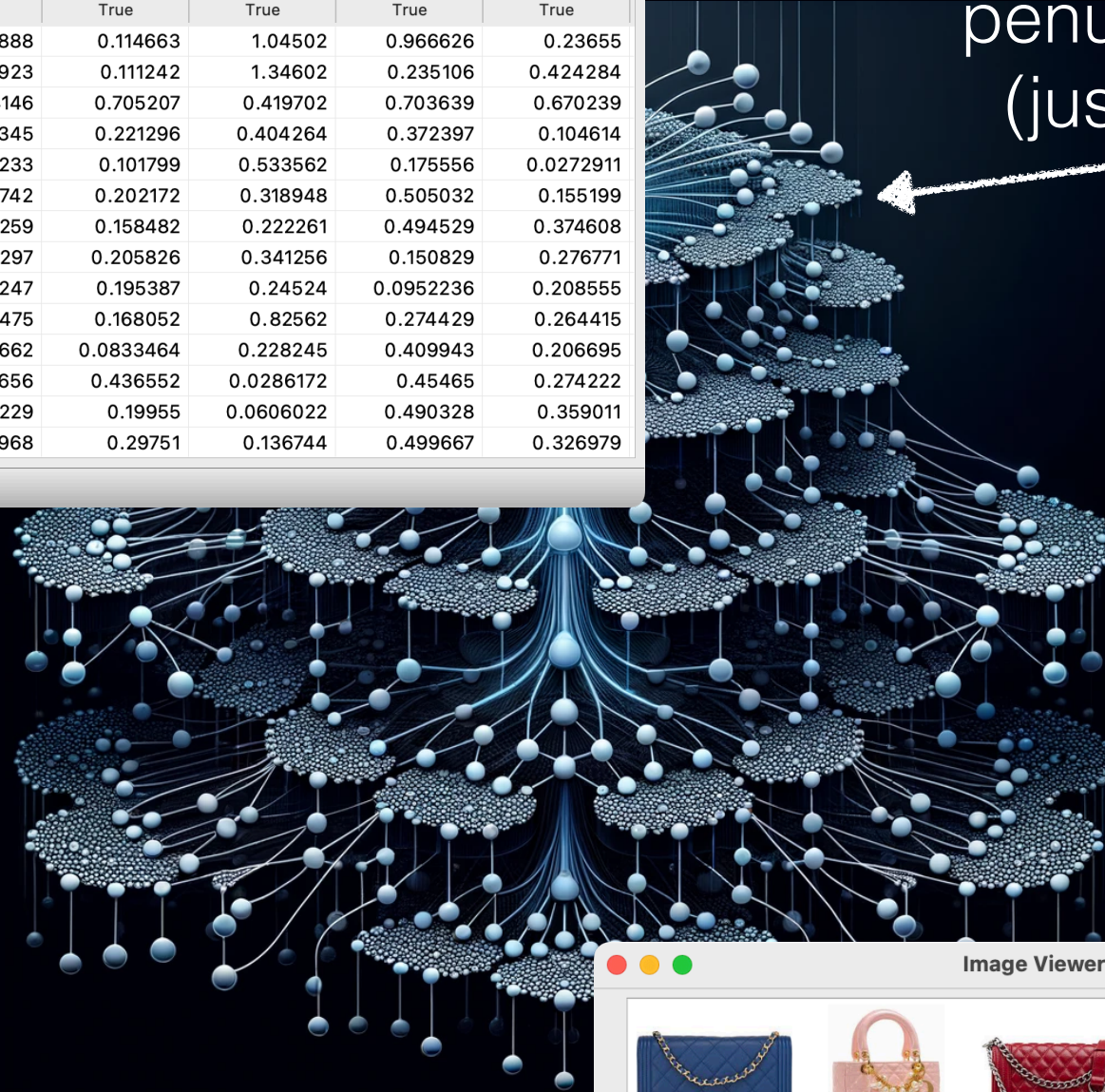
penultimate layer
(just numbers)



input (numbers)

Data Table						
hidden	category	n0 True	n1 True	n2 True	n3 True	n4 True
1	dior	0.227888	0.114663	1.04502	0.966626	0.23655
2	dior	0.139923	0.111242	1.34602	0.235106	0.424284
3	dior	0.164146	0.705207	0.419702	0.703639	0.670239
4	dior	0.225345	0.221296	0.404264	0.372397	0.104614
5	dior	0.630233	0.101799	0.533562	0.175556	0.0272911
6	dior	0.450742	0.202172	0.318948	0.505032	0.155199
7	dior	0.465259	0.158482	0.222261	0.494529	0.374608
8	dior	0.0215297	0.205826	0.341256	0.150829	0.276771
9	dior	0.249247	0.195387	0.24524	0.0952236	0.208555
10	dior	0.206475	0.168052	0.82562	0.274429	0.264415
11	hermes	0.103662	0.0833464	0.228245	0.409943	0.206695
12	hermes	0.0555656	0.436552	0.0286172	0.45465	0.274222
13	hermes	0.169229	0.19955	0.0606022	0.490328	0.359011
14	hermes	0.0919968	0.29751	0.136744	0.499667	0.326979

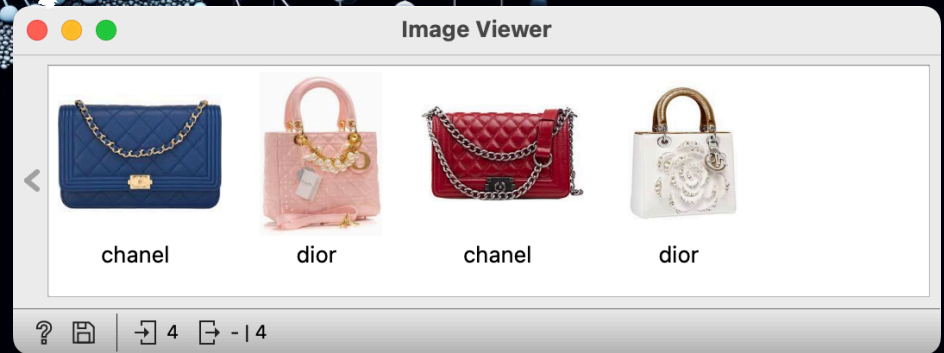
penultimate layer
(just numbers)



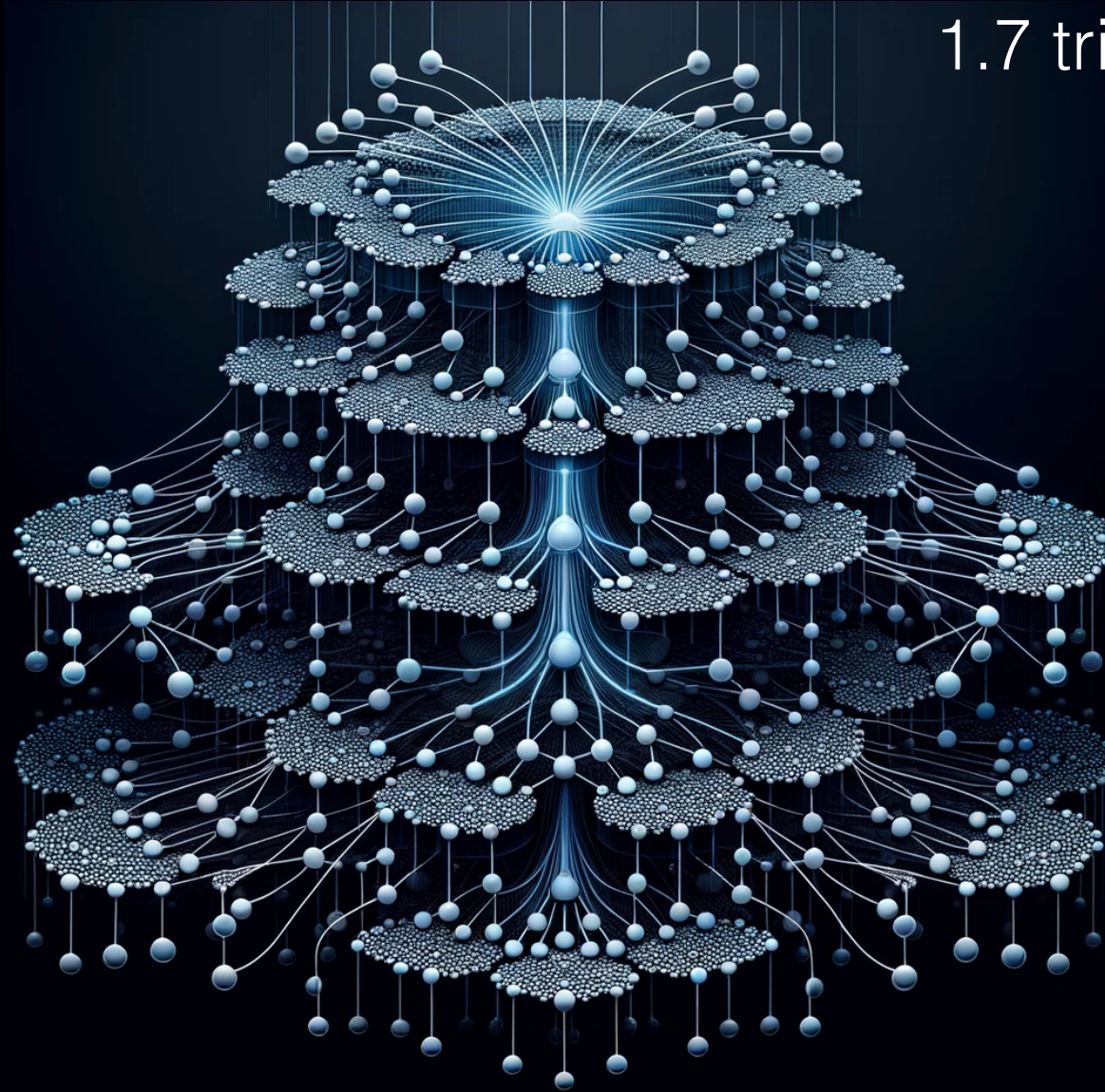
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embedding



chatGPT
1.7 trillion weights



Adoption of AI

(some) Knowledge

(access to the) Data

(a solvable, inspiring) Problem

Adoption of AI

voice recordings
text sequences
images
(access to the) Data
customers sales
sensor data product reviews
social networks

Adoption of AI

(access to the) Data

foundation models

"any model that is trained on broad data
that can be adapted to a wide range of downstream tasks"

The economic opportunities of open foundation models for Europe

Prepared for Meta

23 October 2023

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DELO

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VEDETI VEČ POMENI IMETI MOČ

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+ **Sobotna priloga** Sociolog Boris Mužević o razpadu SFRJ in partije • Kaj nam govorijo drevesa in zakaj jih ne poslušamo?

Na vrsto je prišla pomoč ljudem

S potrjeno novelo zakona o interventnih ukrepih za odpravo posledic avgustovske ujme se ukinja solidarnostni prispevek in uvaja predplačilo za sanacijo stanovanj.

AKTUALNO 3

Na poti odločbe o zavarovanju za dolgotrajno oskrbo

Vsi, ki izpolnjujejo pogoje, bodo po pošti prejeli obvestilo, prispevek bodo začeli plačevati julija 2025.

AKTUALNO 4

SDH v novo prodajo MLM

V SDH bodo začeli zbirati nove nezavezujoče ponudbe za mariborsko livarno.

GOSPODARSTVO 9



o zgodovinskih pretresih na španski politični sceni

MNENJA 11

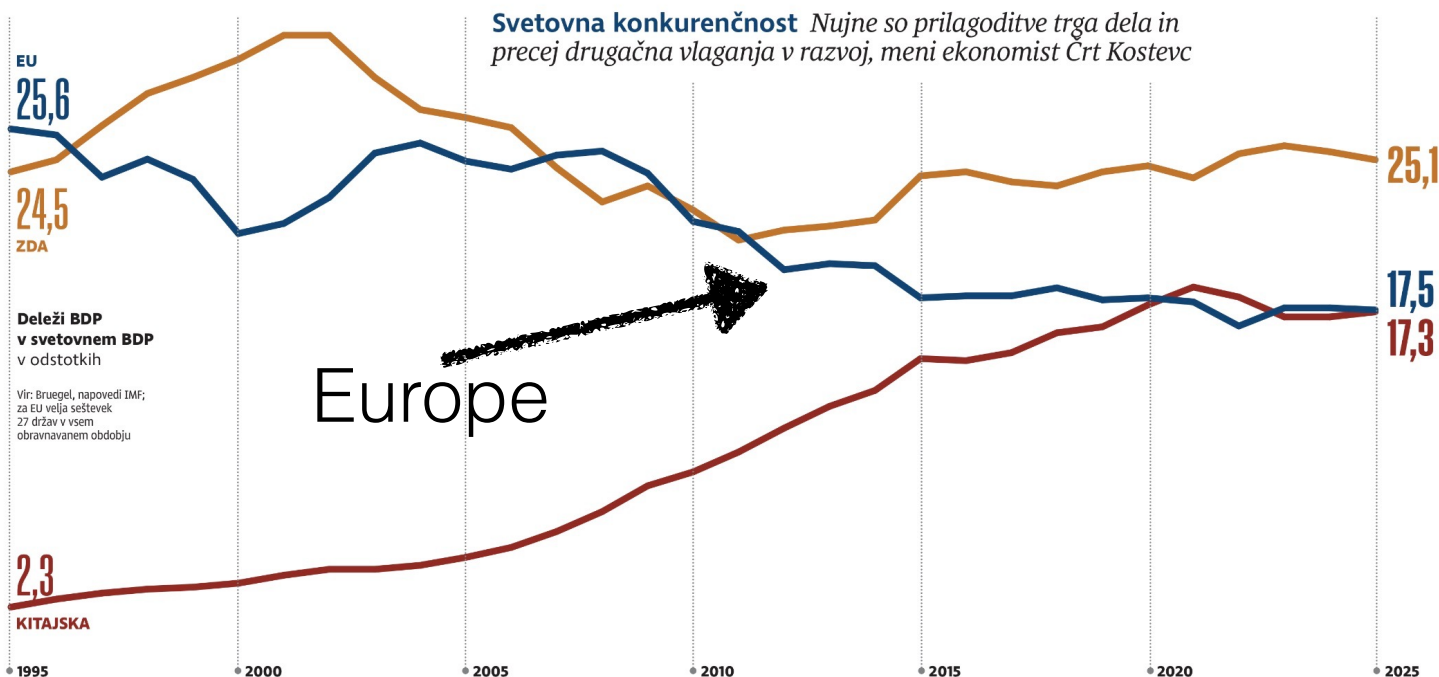
V digitalnem svetu je šport za otroke nujen

Na gibanje pomembno vplivajo gibalne navade staršev, bistveni dejavnik je tudi socialnoekonomski položaj.

SOBOTNA TEMA 14

Evropa potrebuje pospešek v globalni tekmi

Svetovna konkurenčnost Nujne so prilagoditve trga dela in precej drugačna vlaganja v razvoj, meni ekonomist Črt Kostevc



Deleži BDP v svetovnem BDP v odstotkih

Vir: Bruegel, napovedi IMF; za EU velja seštevek 27 držav v vsem obravnavanem obdobju

Evropska unija od začetka finančne krize leta 2008 izgublja korak s konkurenco v globalni gospodarski tekmi, medtem ko ZDA ohranjajo konkurenčno prednost, zelo pa se krepi Kitajska. Evropa potrebuje hitro ukrepanje v pravo smer, pri-

poročila evropski komisiji zdaj pripravlja prekaljeni tehnokrat, nekdanji predsednik ECB in italijanski premier Mario Draghi.

MIHA JENKO

Unija je zdaj v svetovnem merilu najdlje pri zelenem prehodu, nujne pa so spremembe, predvsem ko gre za kapitalski trg in trg dela ter učinkovit prenos znanja in inovacij v proizvodnjo, meni ekonomist Črt Kostevc. »Evropa bo imela še vedno prednost pri zelenem prehodu. Ta

stvar ni končana in je šele dobro v pogonu. In Evropa je zdaj nekaj korakov naprej pri ciljih zniževanja emisij toplogrednih plinov in okoljskega odtisa. Če ji bo uspelo s tem standardom prisiliti Američane, Kitajce, preostalo Azijo in države v razvoju, da bodo ustrezno prilaga-

jali svojo proizvodnjo, bo to že pol zmage,« pravi Kostevc. Pričakuje tudi reformo trga dela, ki bo motivirala podaljšanje delovnika, in če bo Evropa ustrezno prilagodila trg dela, bo postopno in vsaj delno rešen tudi trend vse večjega pokojninskega bremena. Evropski

problem je tudi, kako startati kapitalski trg, kako ustvariti sklade tveganega kapitala. Pri financiranju potrebujemo zdravo kombinacijo države in zasebnega sektorja, dileme o financiranju evropskega razvoja pojasnjuje sogovornik.

▶ STRAN 8



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+ Sobotna priloga Sociolog Boris Mu

aj jih ne poslušamo?

Na vrsto je prišla pomoč ljudem

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SOBOTNA TEMA 14

Evropa

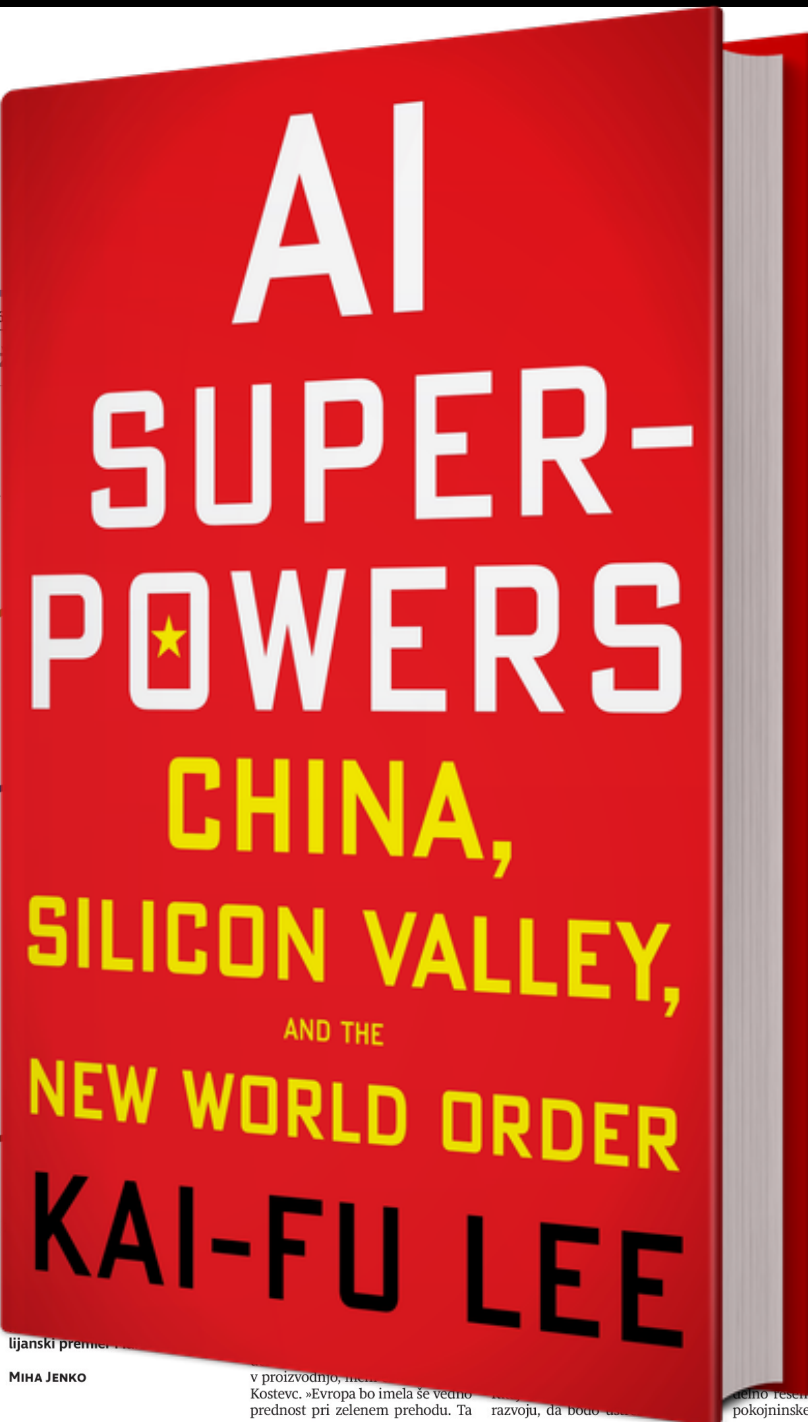


Deleži BDP v svetovnem BDP v odstotkih

Vir: Bruegel, napovedi IMF; za EU velja seštevek 27 držav v vsem obravnavanem obdobju



Evropska unija od začetka finančne krize leta 2008 izgublja korak s konkurenco v globalni gospodarski tekmi, medtem ko ZDA ohranjajo konkurenčno prednost, zelo pa se krepi Kitajska. Evropa potrebuje hitro ukrepanje v pravo smer, pri-

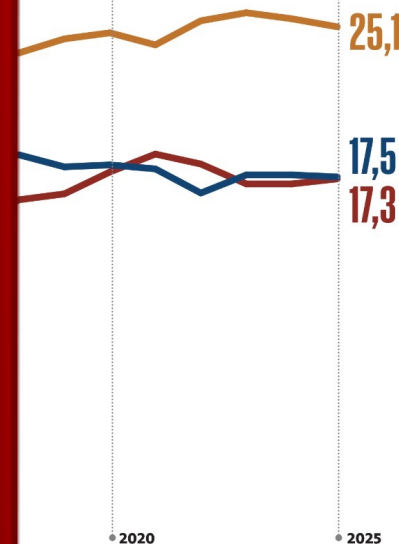


lijanski premier... MIHA JENKO

v proizvodnjo, med... Kostevc. »Evropa bo imela še vedno prednost pri zelenem prehodu. Ta

balni tekmi

trga dela in... Crt Kostevc



izvodnjo, bo to že pol... Kostevc. tudi reformo trga dela, arala podaljšanje delov... Evropa ustrezno prilaj... bo postopno in vsaj... tudi trend vse večjega pokojninskega bremena. Evropski

problem je tudi, kako startati kapitalski trg, kako ustvariti sklade tveganega kapitala. Pri financiranju potrebujemo zdravo kombinacijo države in zasebnega sektorja, dileme o financiranju evropskega razvoja pojasnjuje sogovornik.

▶ STRAN 8

Adoption of AI

(some) Knowledge

(access to the) Data

(a solvable, inspiring) Problem

Adoption of AI

5% training Knowledge

90 % data preparation Data

5% brainstorming Problem

Adoption of AI

pilots, workshops on the fly Knowledge



learning process

(2) Data

(1) Problem

Adoption of AI

Knowledge

Data

Problem

Adoption of AI

Knowledge

Data

Problem

Courage

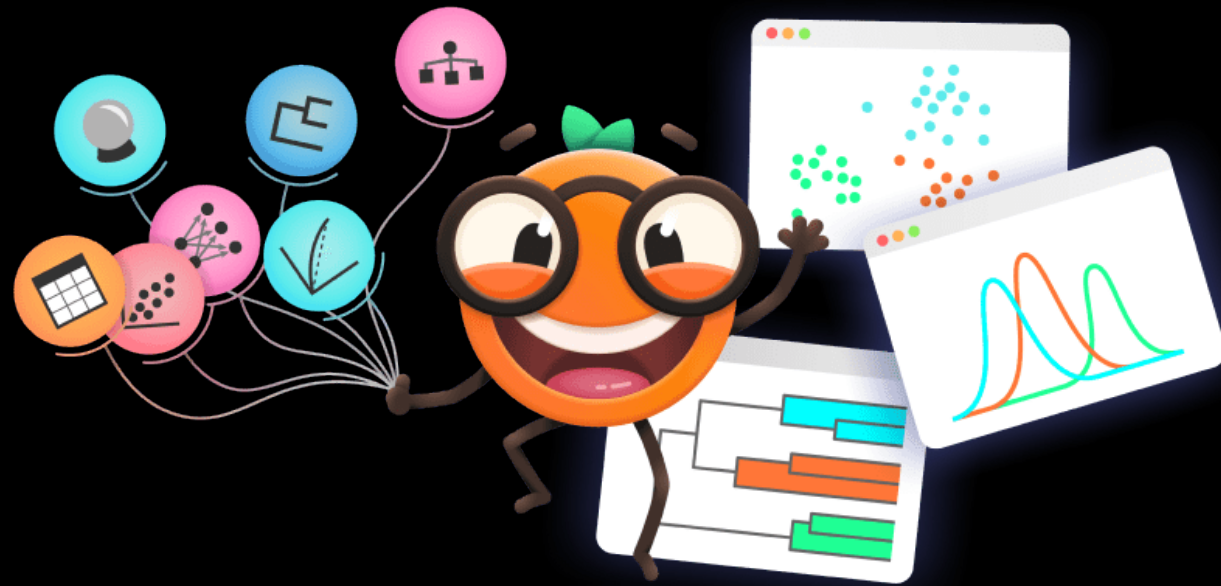
Thanks to...

Organizers of PKP for inviting me; special thanks to Polona Domadenik Muren

Over 20 members of Bioinformatics Lab at the Faculty of Computer and Information Science, University of Ljubljana

Members of Revelo, the spin-out company

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