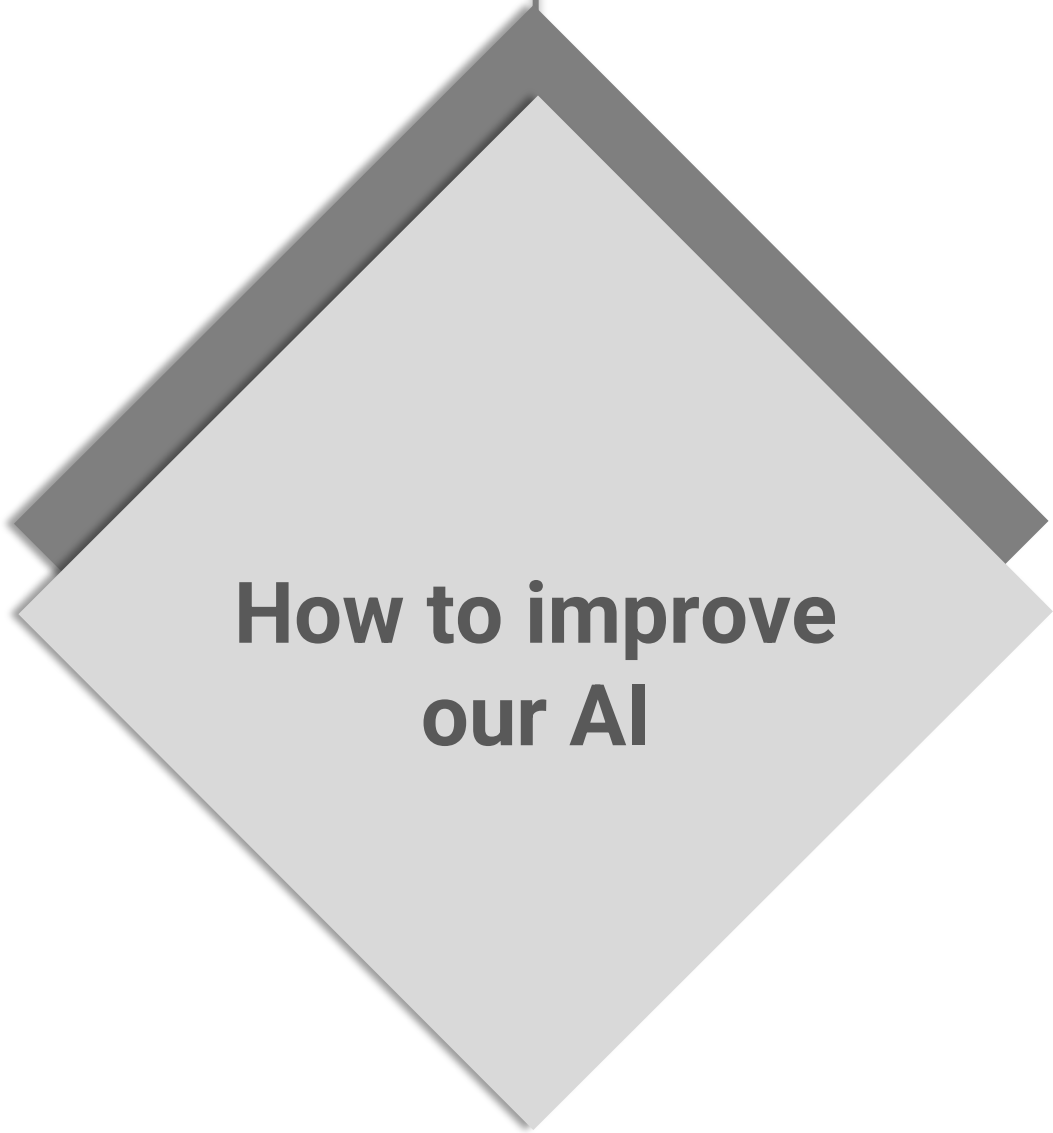
How to improve our AI

1. Review
2. Analyze the result
3. What more?
4. Neural networks
5. Final project



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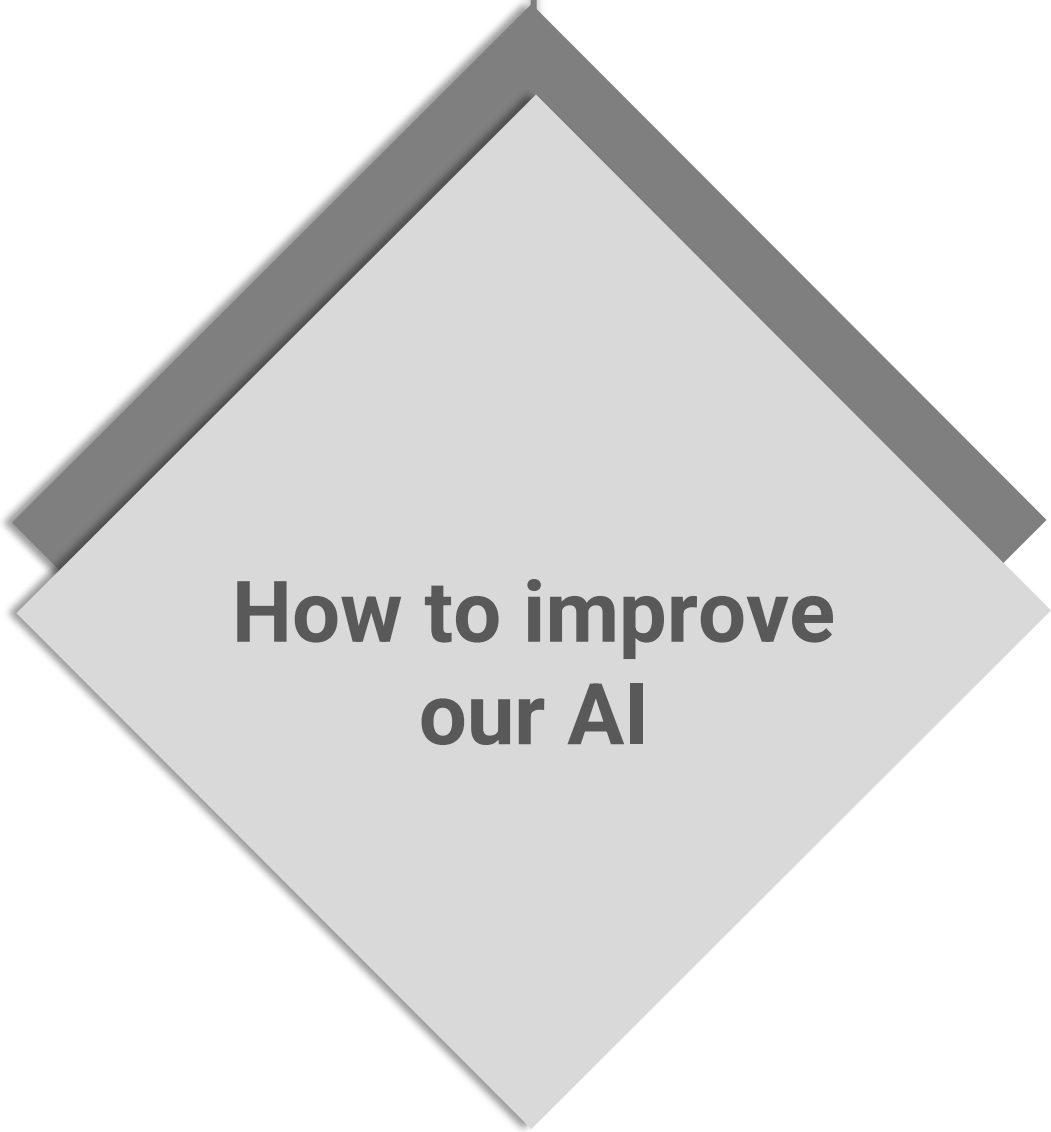

1. Review

Data

Analyzing

Preprocessing

Data Science

1. Review

- Data
- Analyzing
- Preprocessing

Data Science

	id	gender	age	hypertension	heart_disease	ever_married	work_type	Residence_type	avg_glucose_level	bmi	smoking_status	stroke
0	9046	Male	67.0	0	1	Yes	Private	Urban	228.69	36.6	formerly smoked	1
1	51676	Female	61.0	0	0	Yes	Self-employed	Rural	202.21	NaN	never smoked	1
2	31112	Male	80.0	0	1	Yes	Private	Rural	105.92	32.5	never smoked	1
3	60182	Female	49.0	0	0	Yes	Private	Urban	171.23	34.4	smokes	1
4	1665	Female	79.0	1	0	Yes	Self-employed	Rural	174.12	24.0	never smoked	1
5	56669	Male	81.0	0	0	Yes	Private	Urban	186.21	29.0	formerly smoked	1
6	53882	Male	74.0	1	1	Yes	Private	Rural	70.09	27.4	never smoked	1

1. Review

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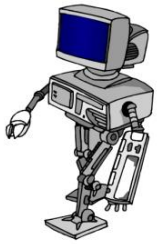
	gender	age	hypertension	heart_disease	ever_married	Residence_type	avg_glucose_level	bmi	stroke
0	0	67.0	0	1	1	0	228.69	36.6	1
2	0	80.0	0	1	1	1	105.92	32.5	1
3	1	49.0	0	0	1	0	171.23	34.4	1
4	1	79.0	1	0	1	1	174.12	24.0	1
5	0	81.0	0	0	1	0	186.21	29.0	1

1. Review

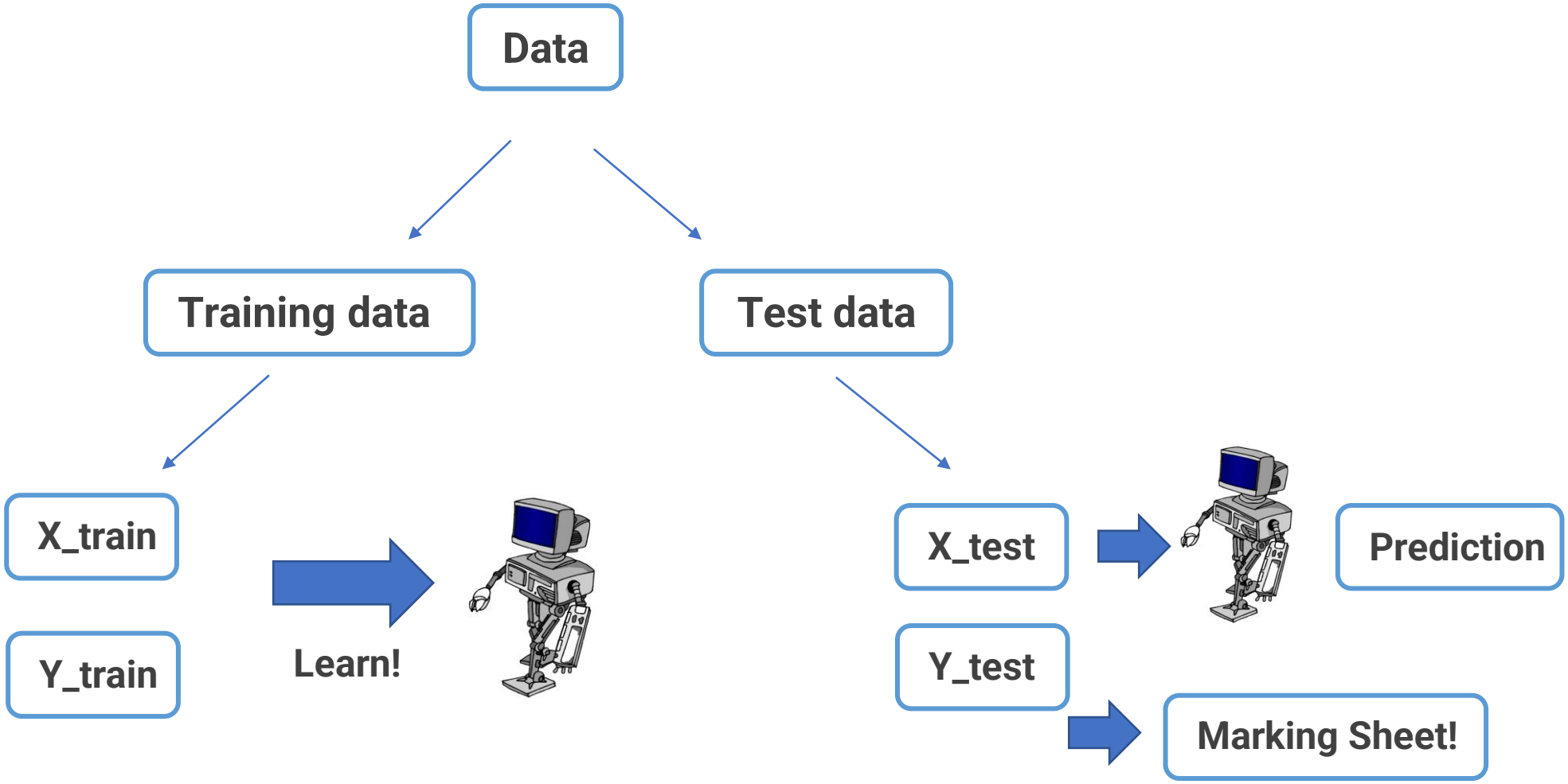
Decision Tree



Input (X) → **Output (Y)**

	gender	age	hypertension	heart_disease	ever_married	Residence_type	avg_glucose_level	bmi	stroke
0	0	67.0	0	1	1	0	228.69	36.6	1
2	0	80.0	0	1	1	1	105.92	32.5	1
3	1	49.0	0	0	1	0	171.23	34.4	1
4	1	79.0	1	0	1	1	174.12	24.0	1
5	0	81.0	0	0	1	0	186.21	29.0	1

1. Review



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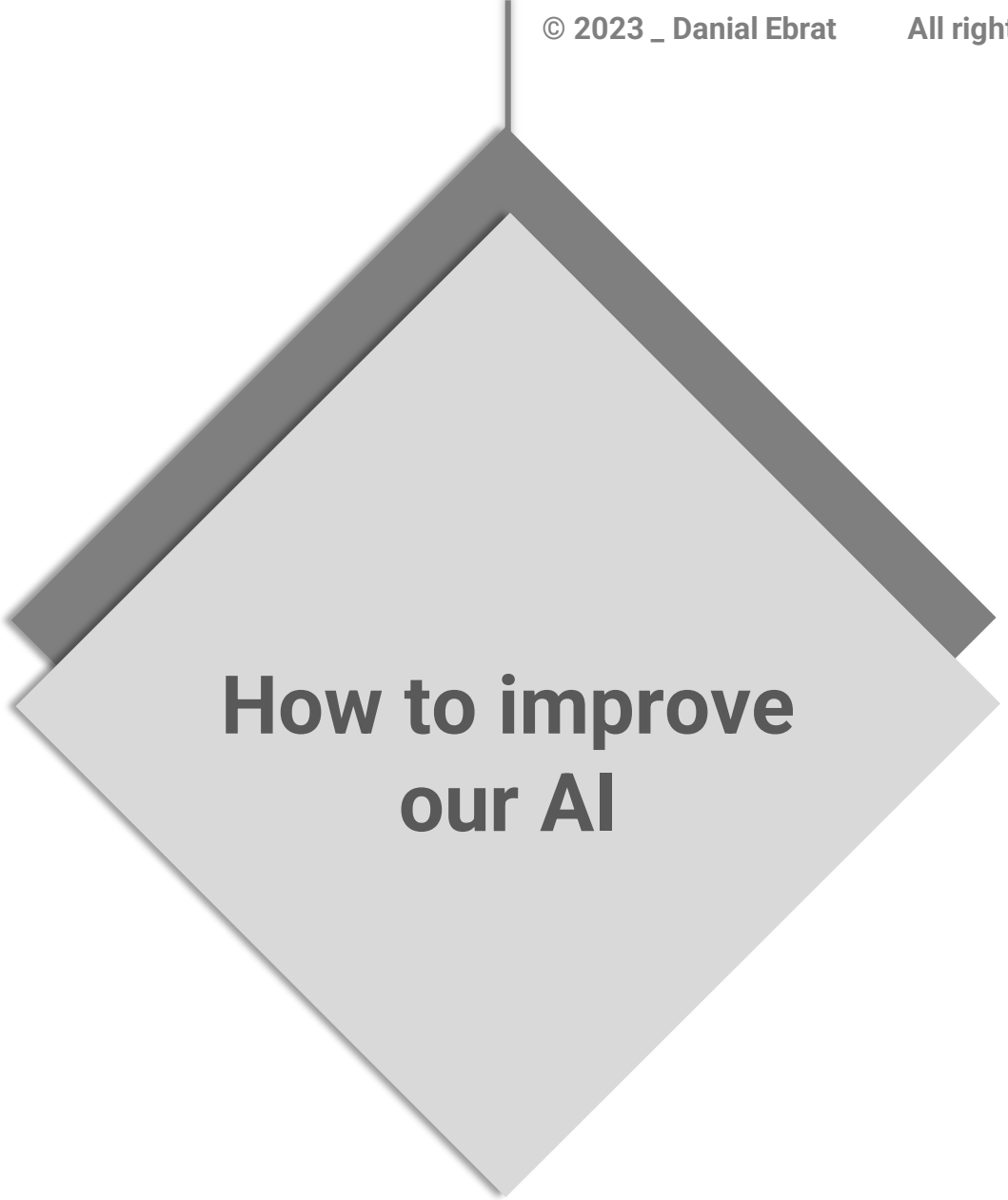

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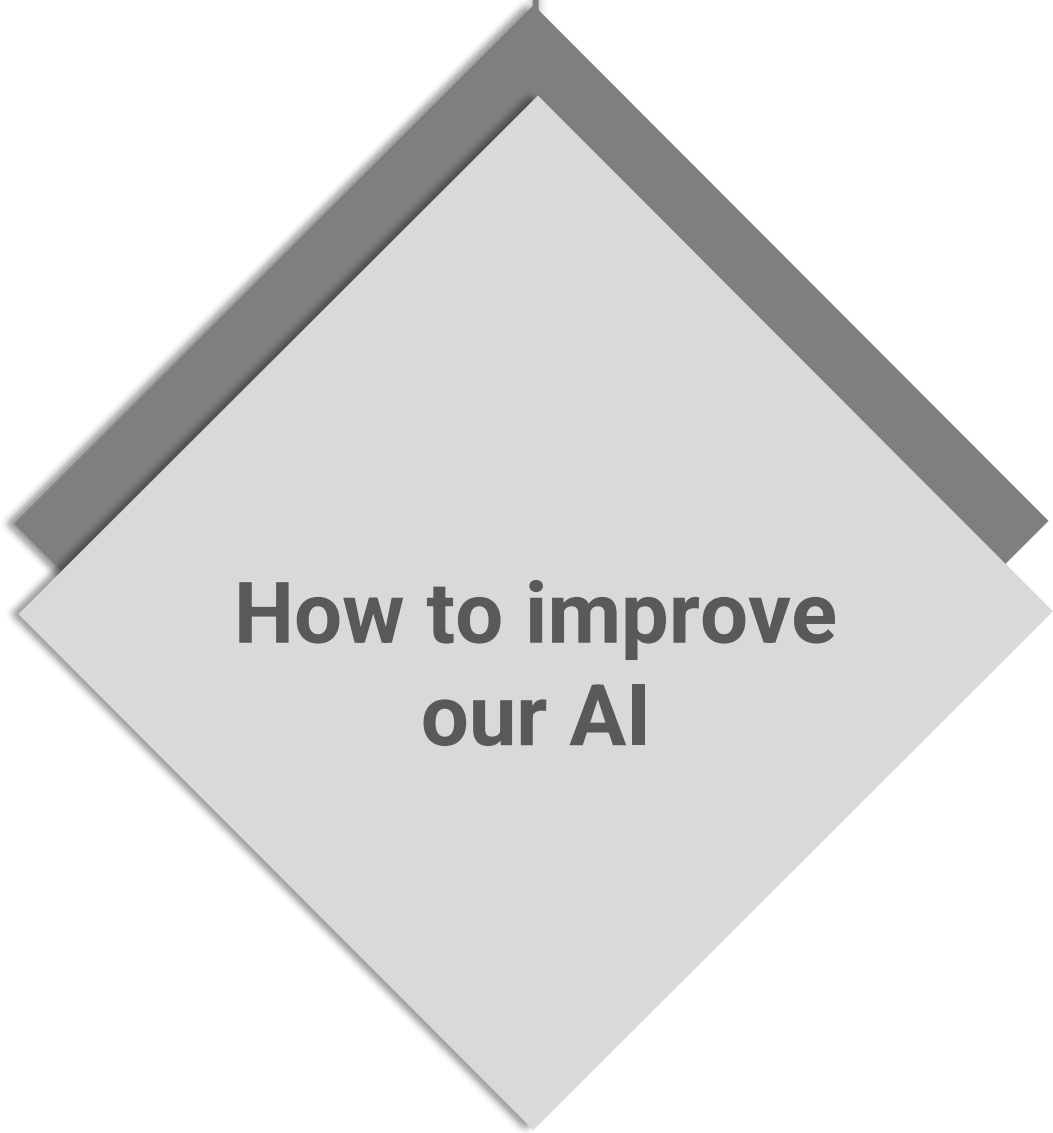

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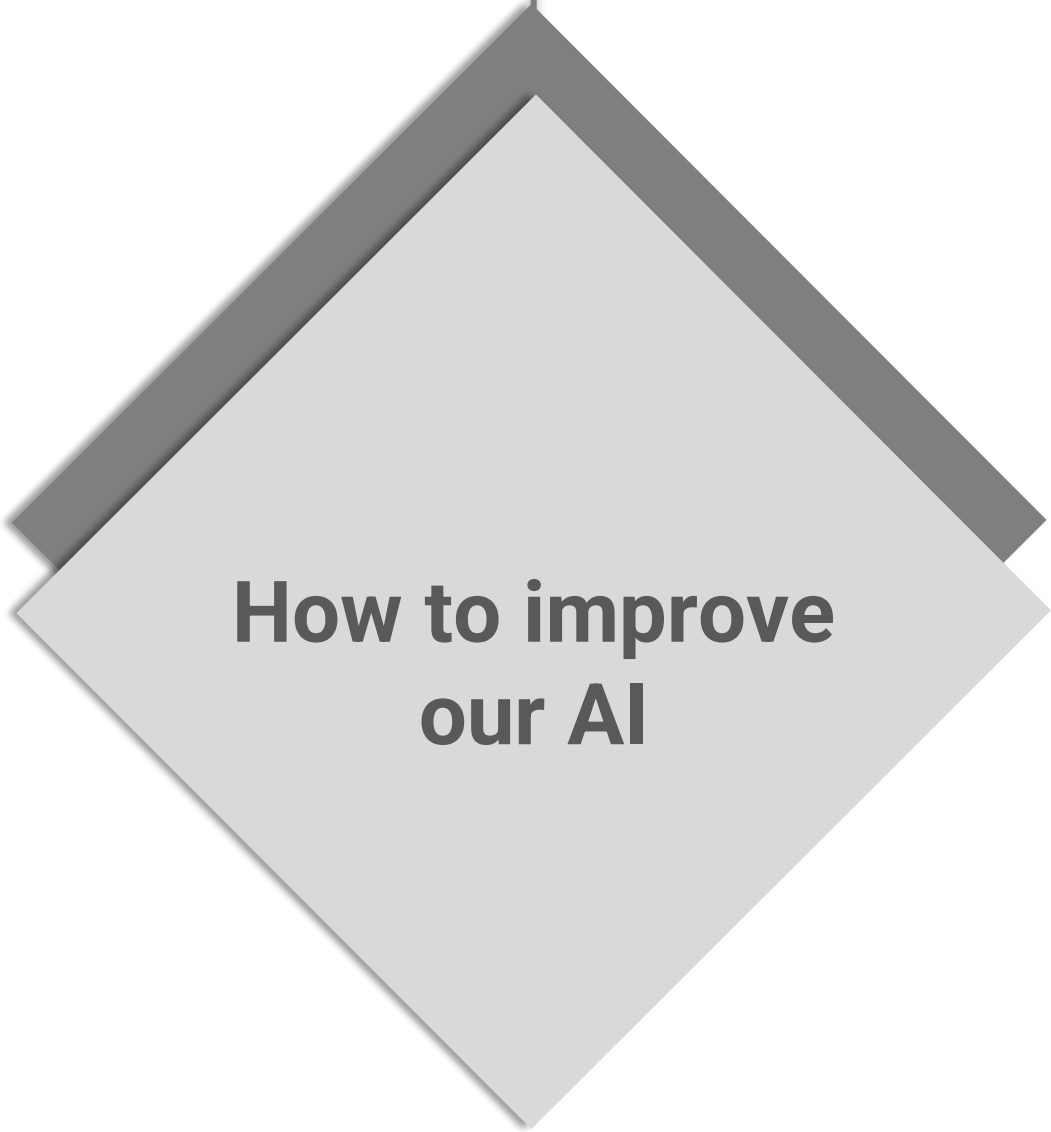


2. Analyze the result

Accuracy : 0.9317718940936863

classification report:

		precision	recall	f1-score	support
No Stroke	0	0.96	0.96	0.96	943
Stroke	1	0.15	0.15	0.15	39
accuracy				0.93	982
macro avg		0.56	0.56	0.56	982
weighted avg		0.93	0.93	0.93	982

2. Analyze the result

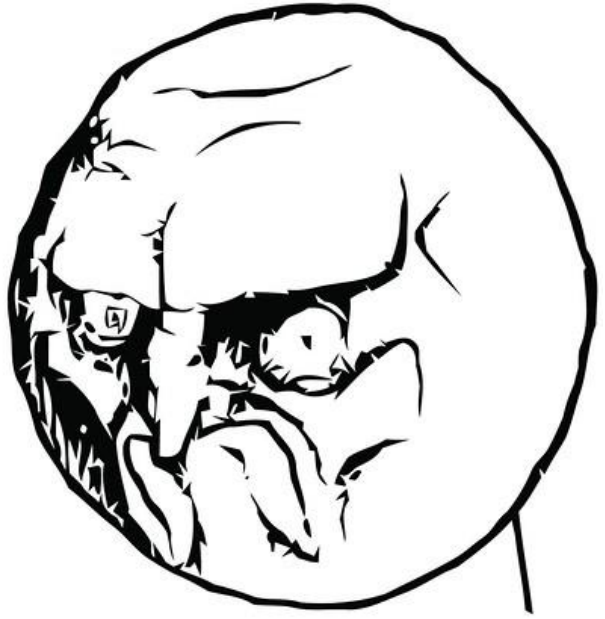
Can we see the rules ??

Yes

2. Analyze the result

Can we always see the rules ??

Can we always know how AI decides ??



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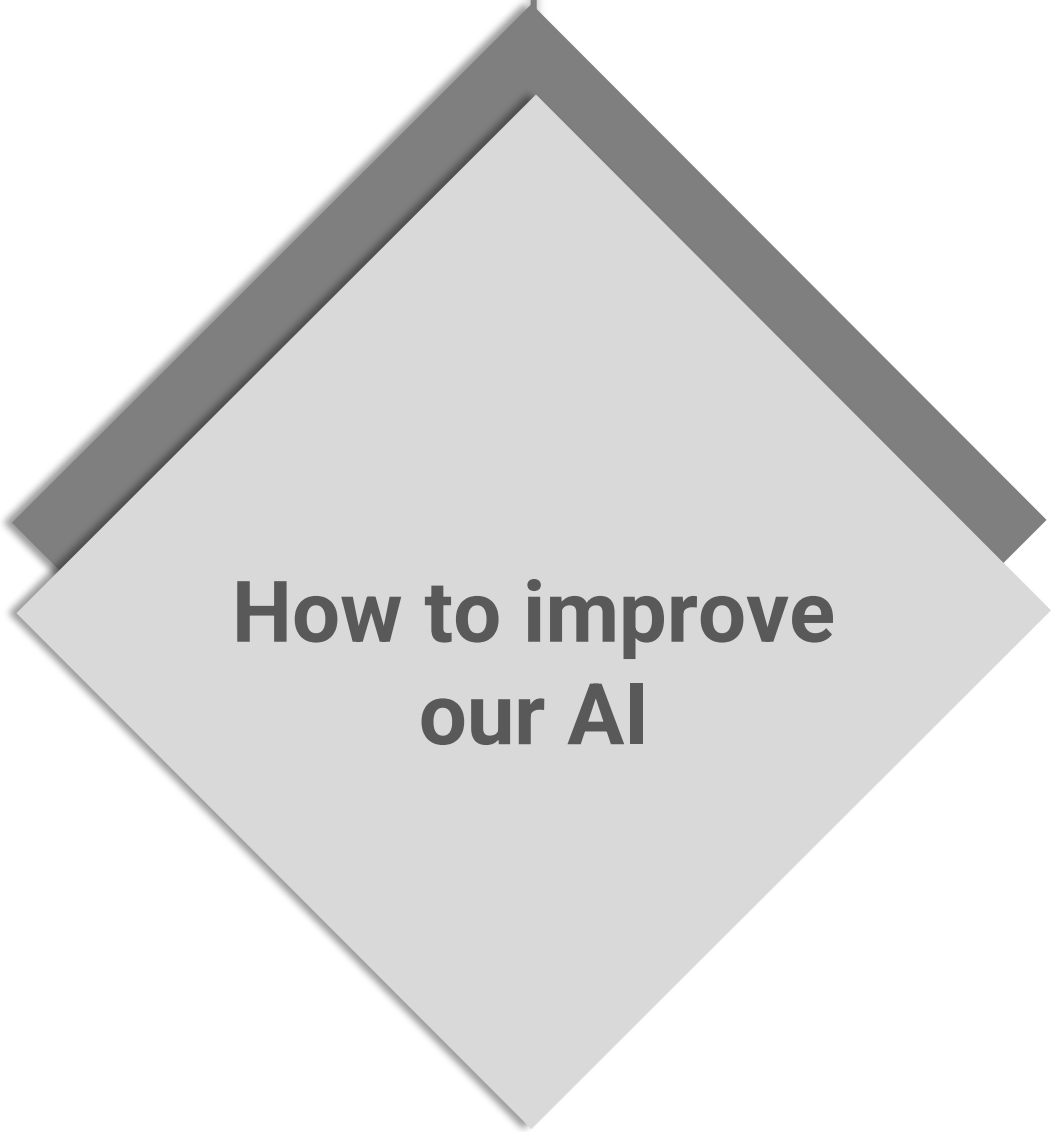

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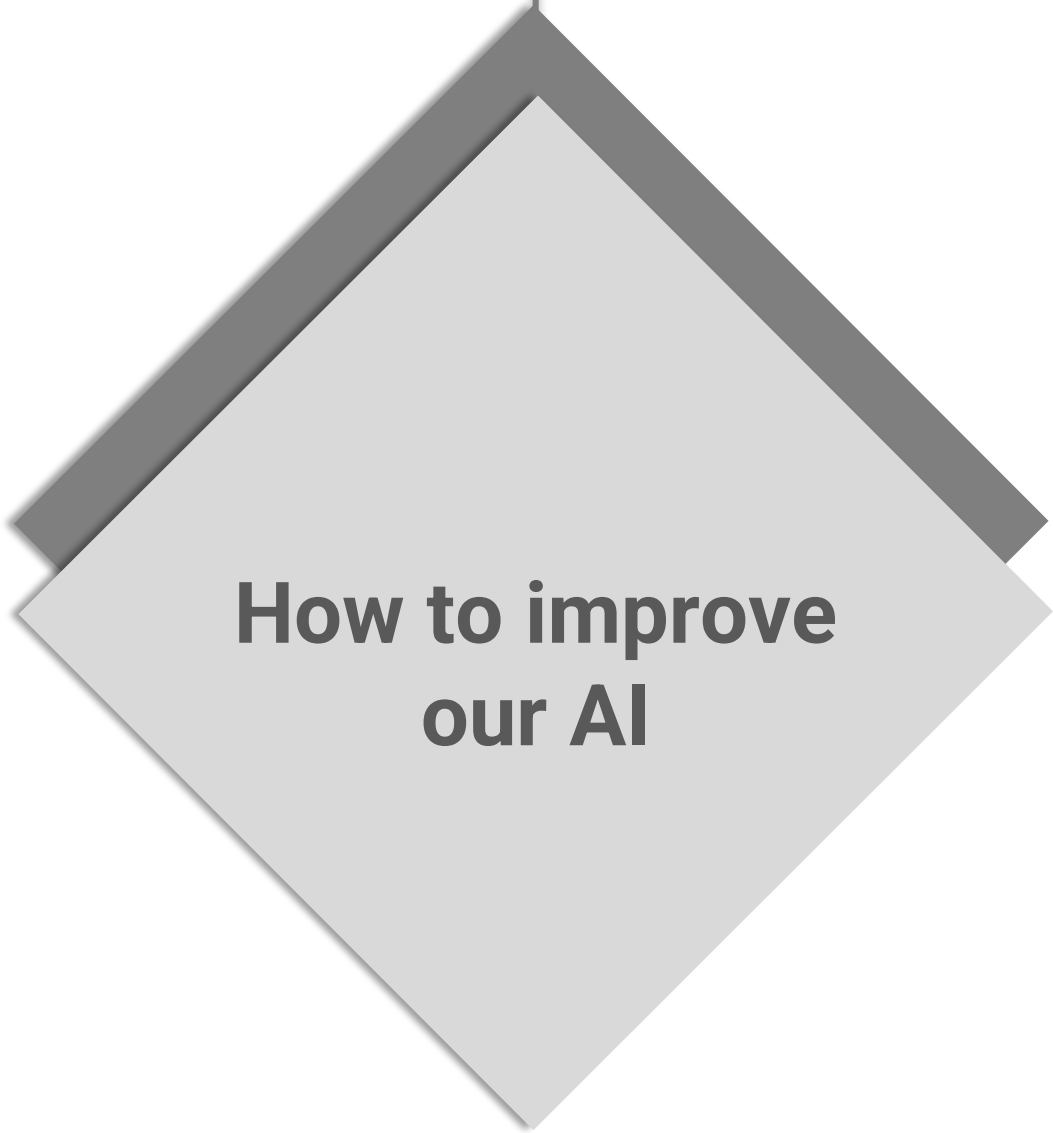

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How to improve our AI

3. What more?

- Why can we predict no stroke with high accuracy, but we cannot predict a stroke with the same accuracy?

Unbalanced data

3. What more?

- What can we do to improve our AI?

Data

Analyzing

Preprocessing

Select ML algorithm

Training the AI (model)

Testing the model (taking the exam!)

Analyzing the results

3. What more?

Create a better material to train AI

3. What more?

Use More advanced ML algorithms regarding the problem

3. What more?

Let’s see how Humans learn ! We are very good in learning!

How do we learn?

1. Review
2. Analyze the result
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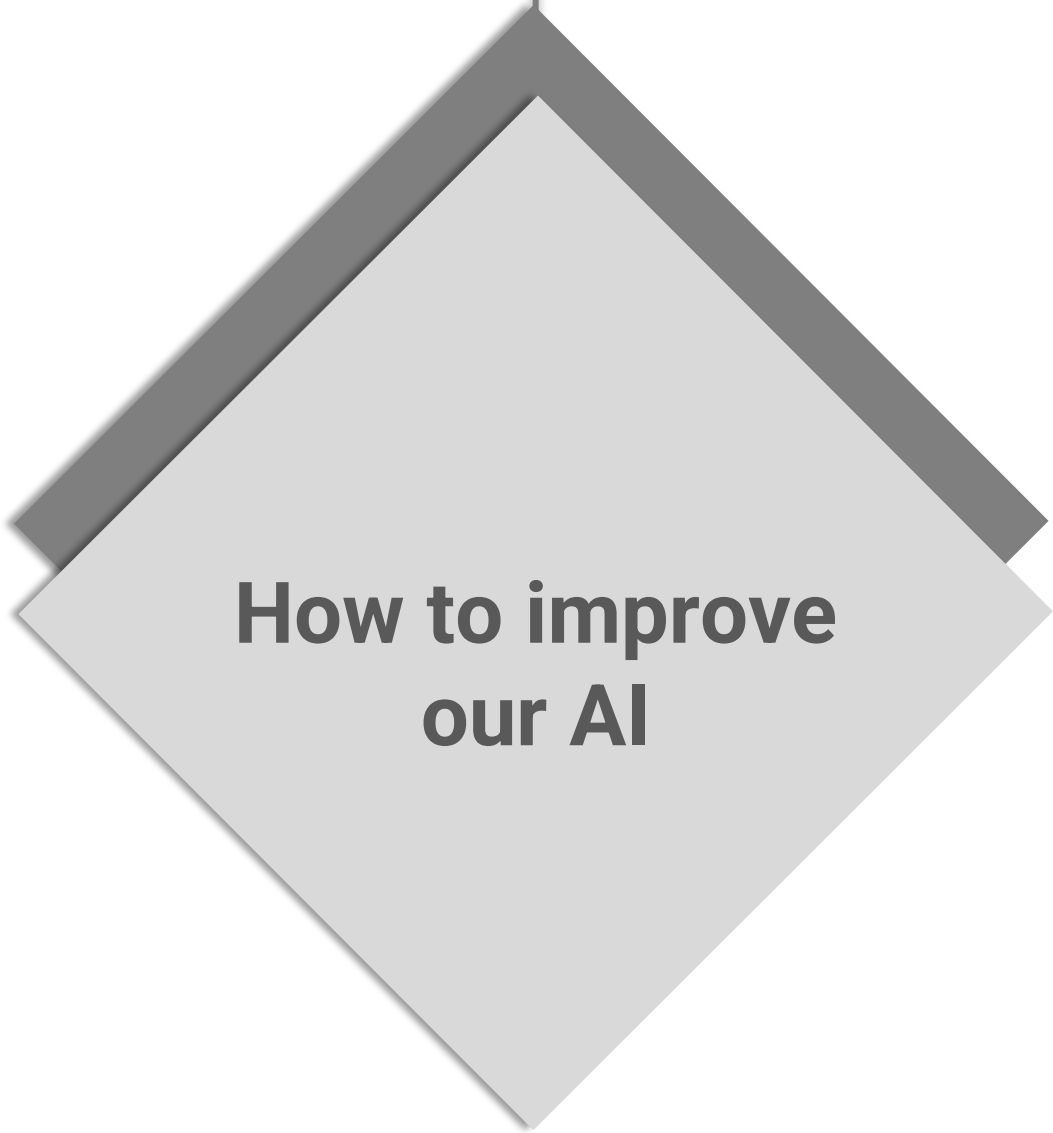

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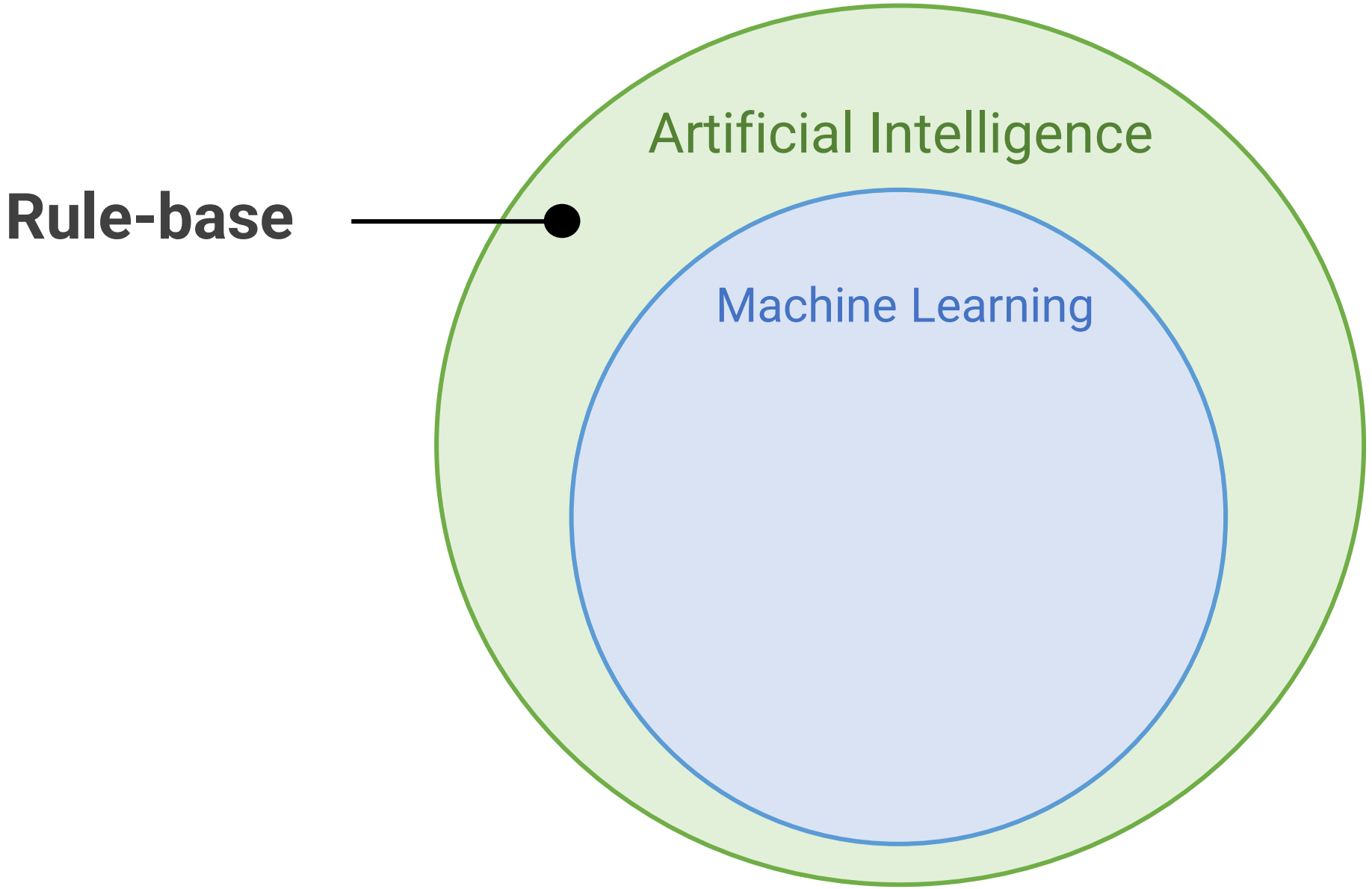
4. Neural networks



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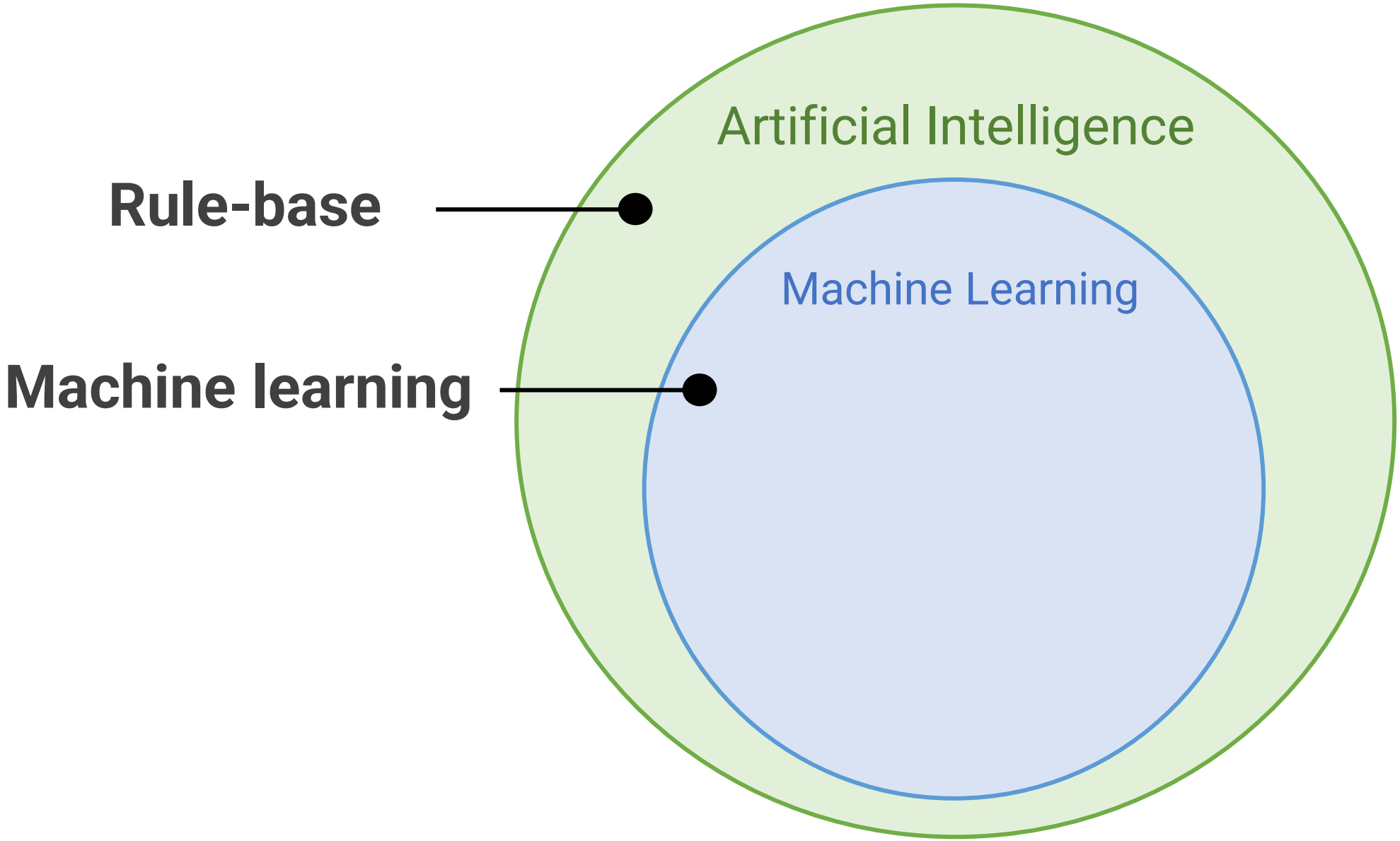

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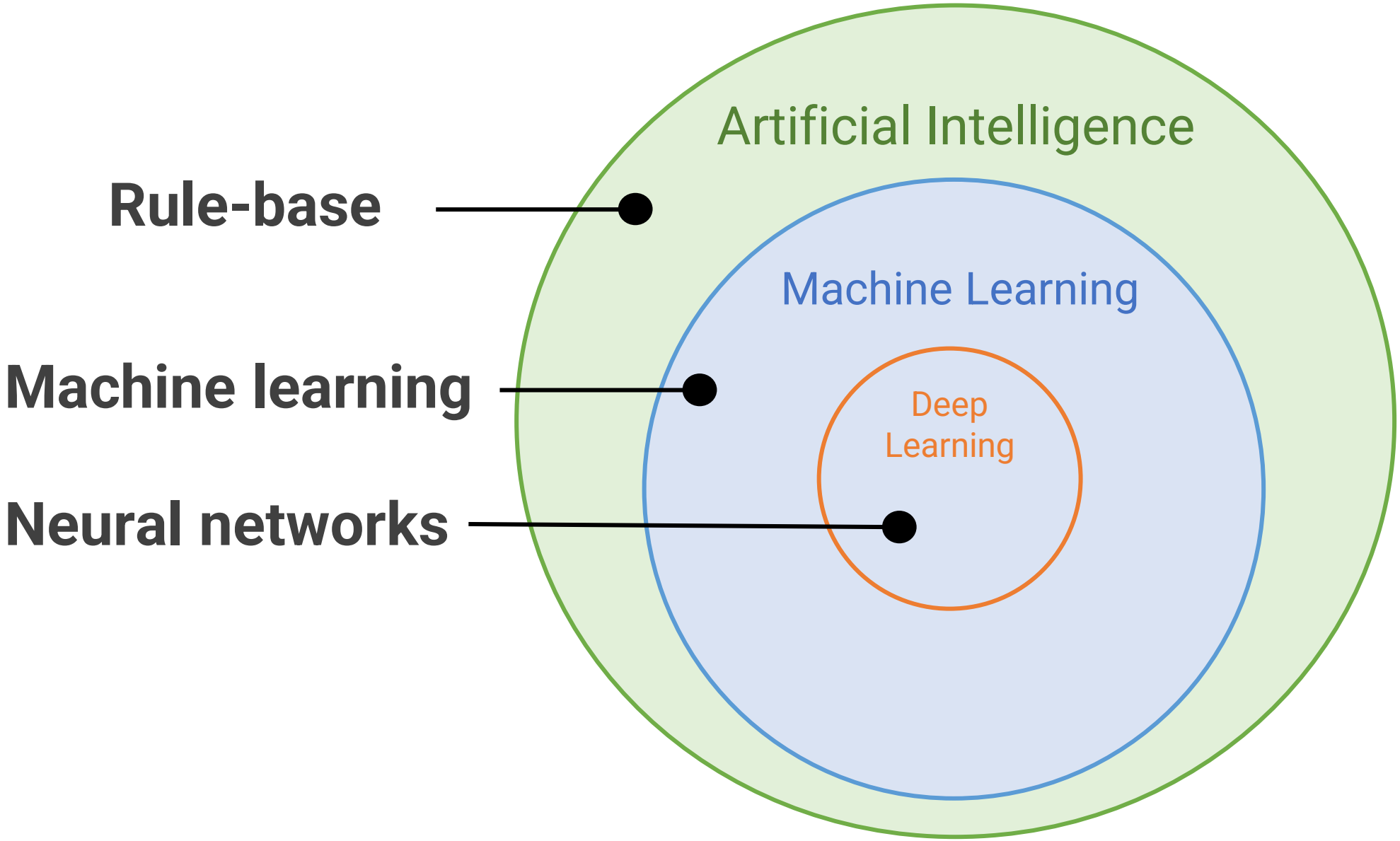

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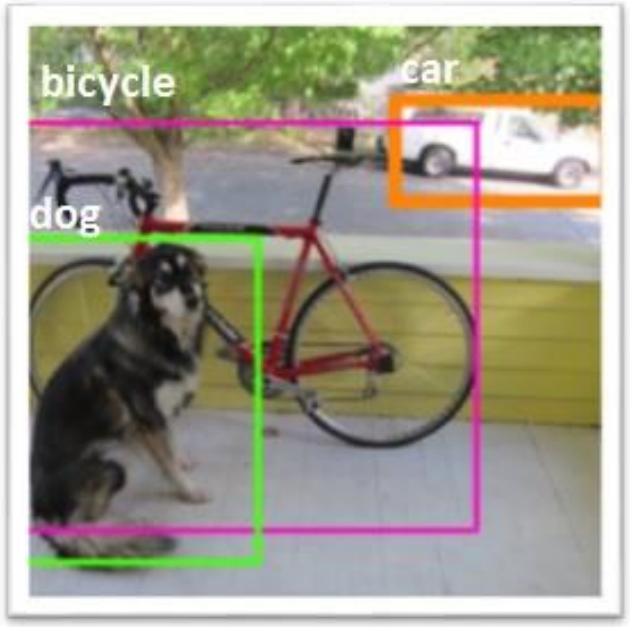

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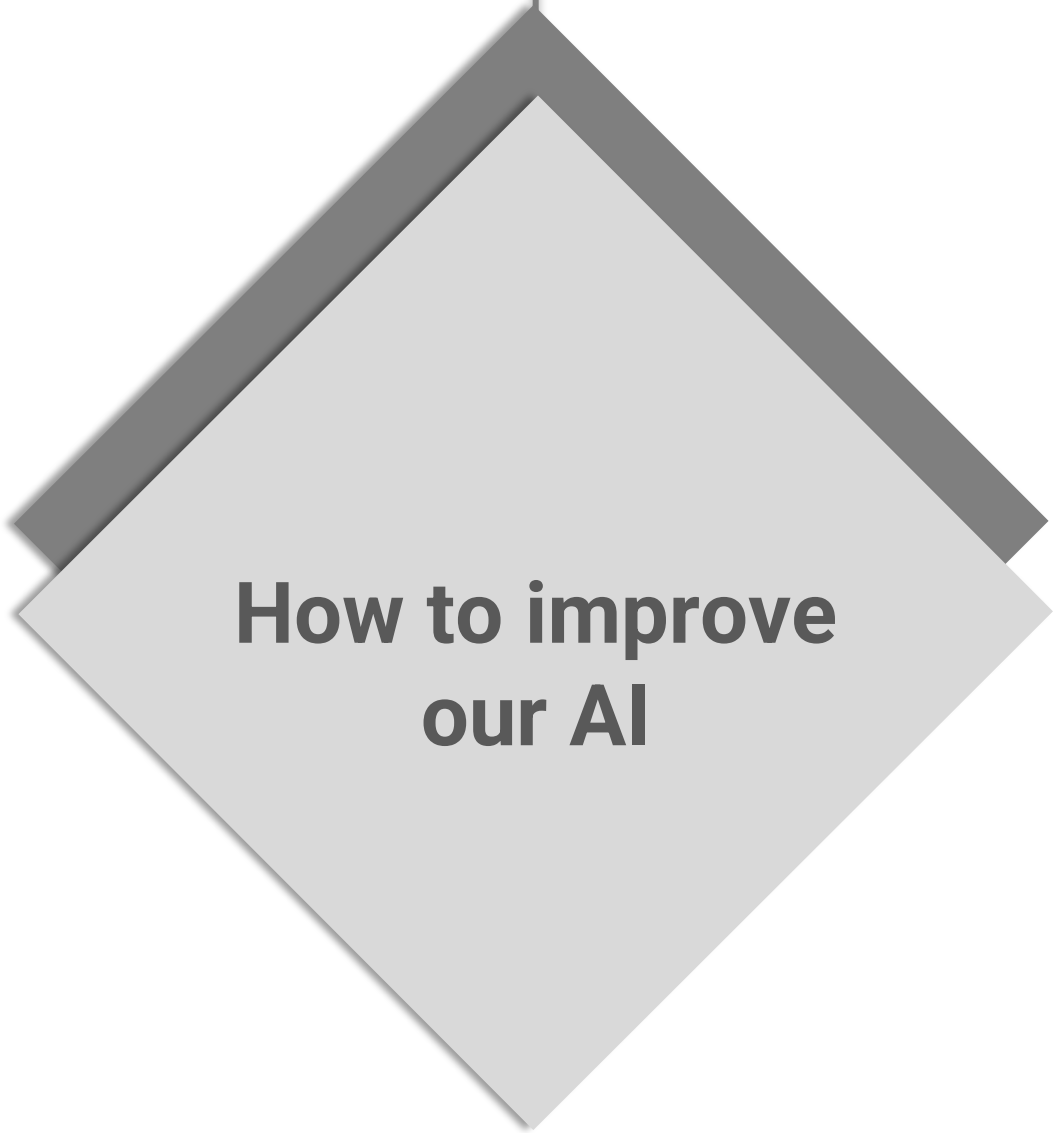

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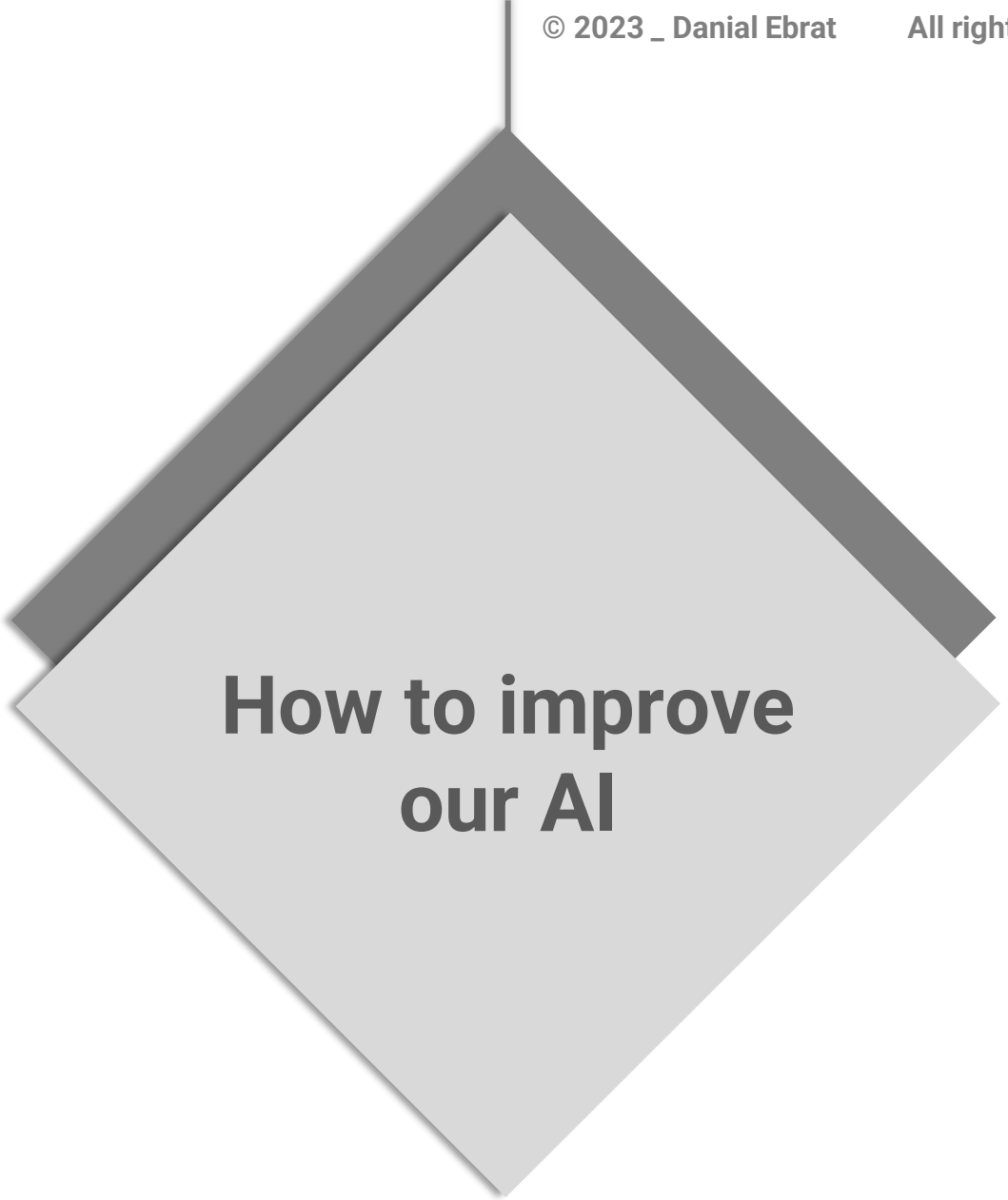
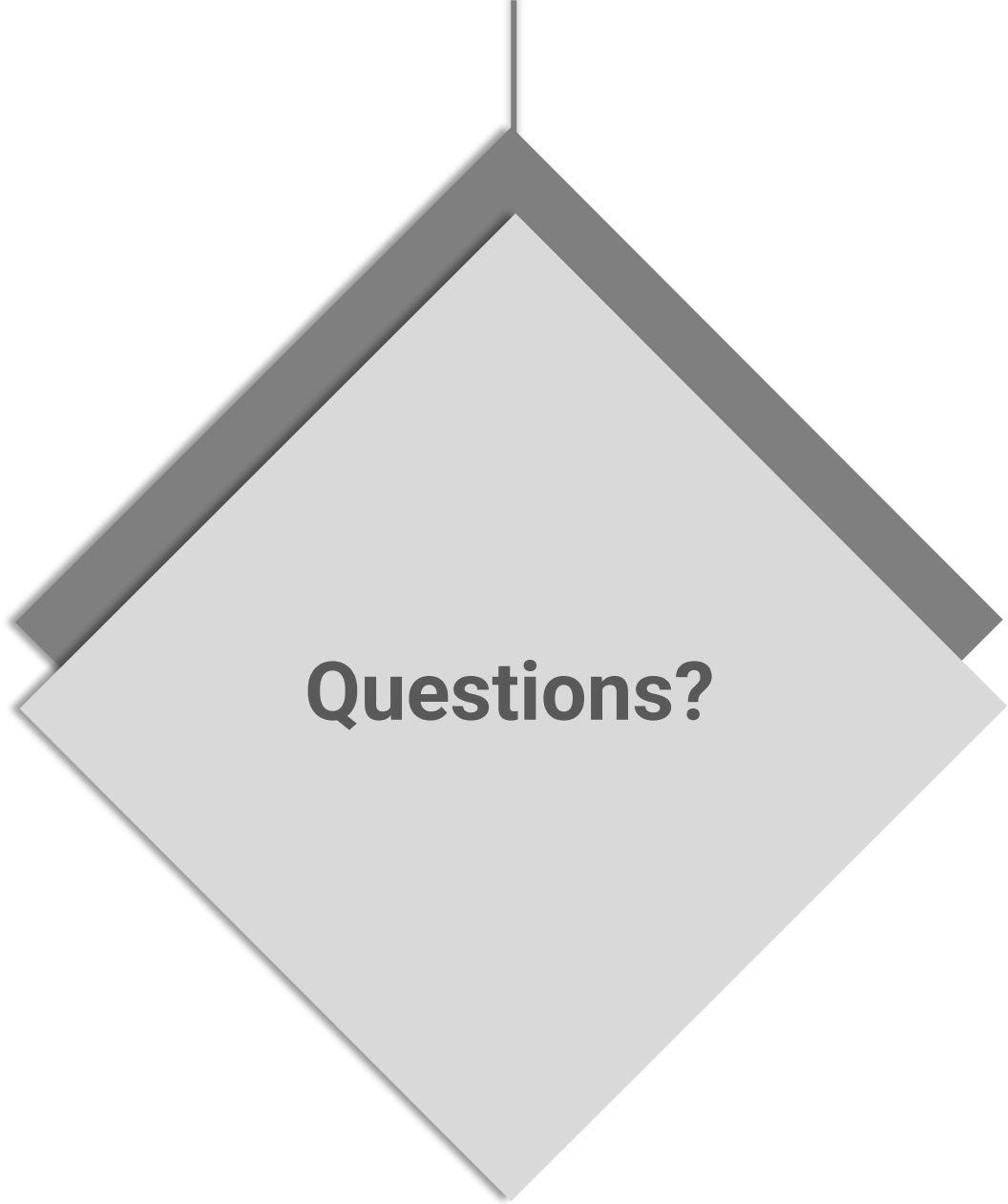


5. Final project

Virtual Voice Assistant (Alexa)

Artificial neural networks
(Brief introduction to Deep learning)



Homework

- Research how neural networks in humans help us to learn and send me your thoughts. How do we learn as a human?
- Install Python, Pip and Pycharm on your computers
  - First you have to install Python on your computers.
  - Then you have to install pip if needed.
  - Then you can download and install pycharm community edition