Aktivitas 1:
Memahami Neural Networks

Deep Learning

Pertemuan 2

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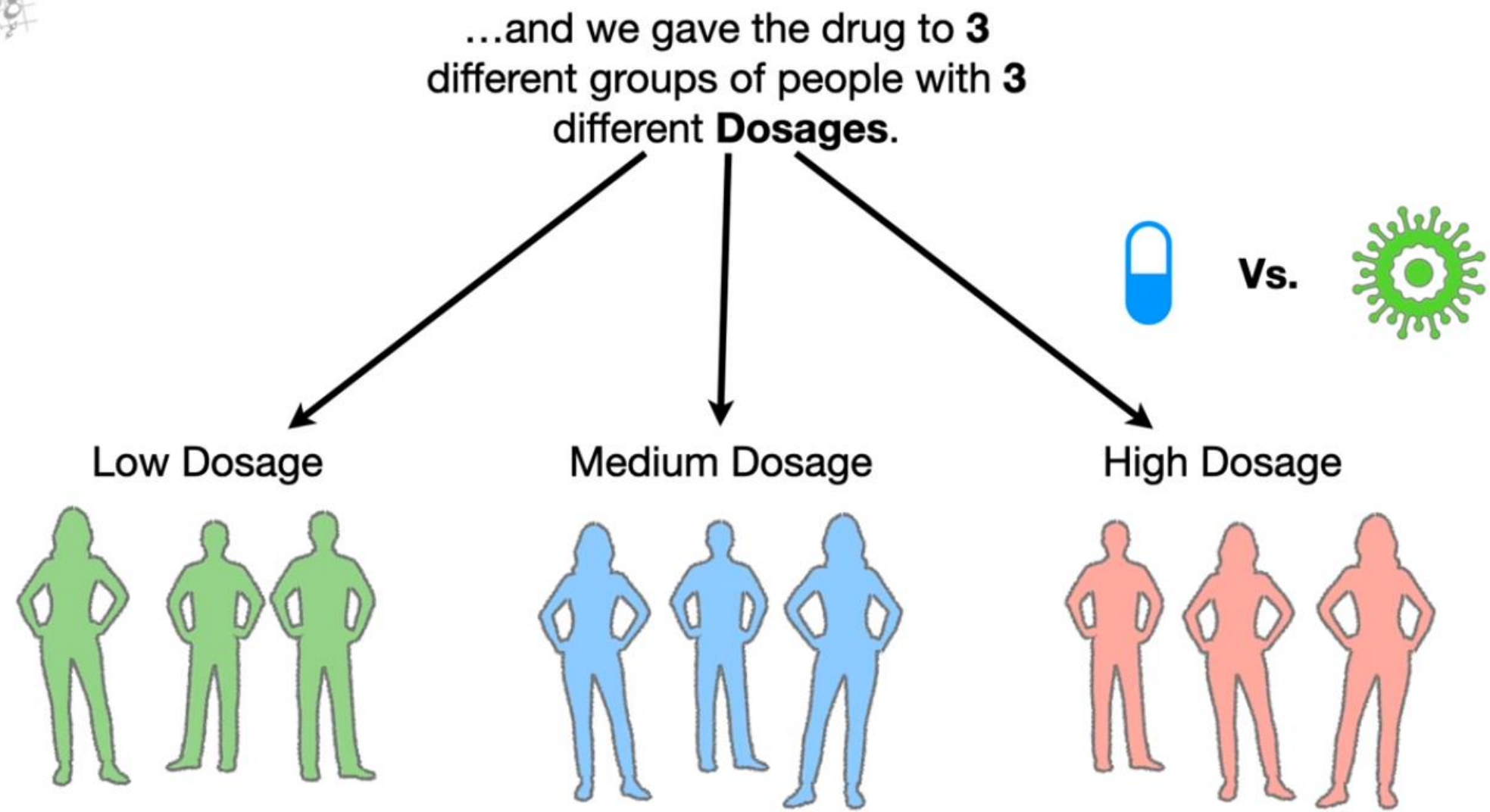
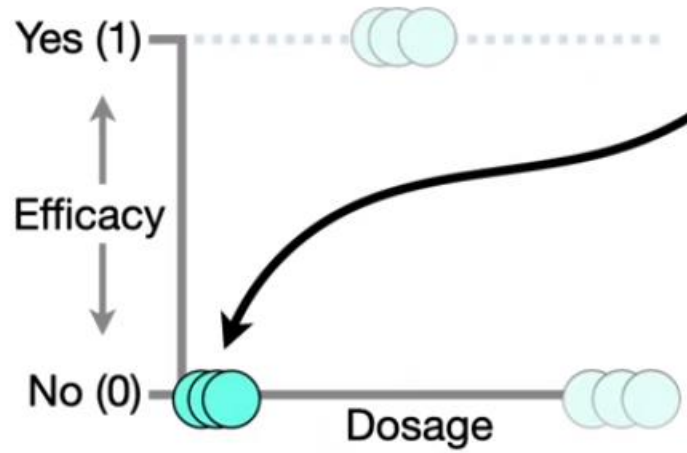
Studi Kasus

- Suatu obat diujicobakan terhadap tiga kelompok orang:
  - **Kelompok 1**: Dosis rendah (Low Dosage)
  - **Kelompok 2**: Dosis menengah (Medium Dosage)
  - **Kelompok 3**: Dosis tinggi (High Dosage)
- Kita ingin memprediksi apakah suatu dosis memiliki efektivitas yang tinggi atau rendah menggunakan Neural Networks



Source: Neural Networks Pt. 1: Inside the Black Box
https://youtu.be/CqOfi41LfDw?si=PHKQsZbWT-nEfoJC

The low **Dosages** were ***not Effective***, so we set them to **0** on this graph.

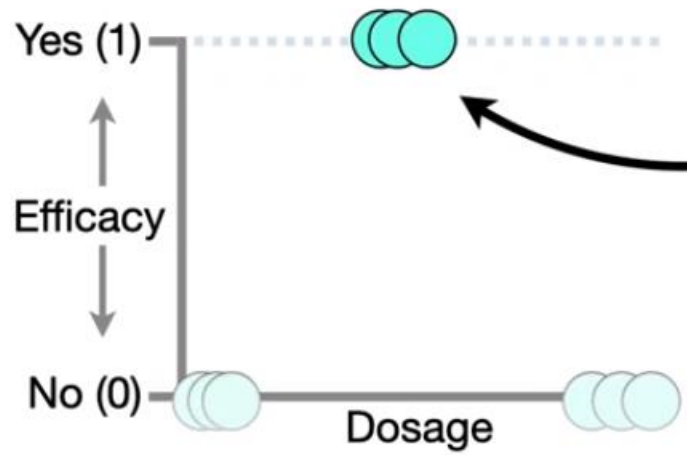


Low Dosage

Medium Dosage

High Dosage

In contrast, the medium **Dosages** were ***Effective***, so we set them to **1**.

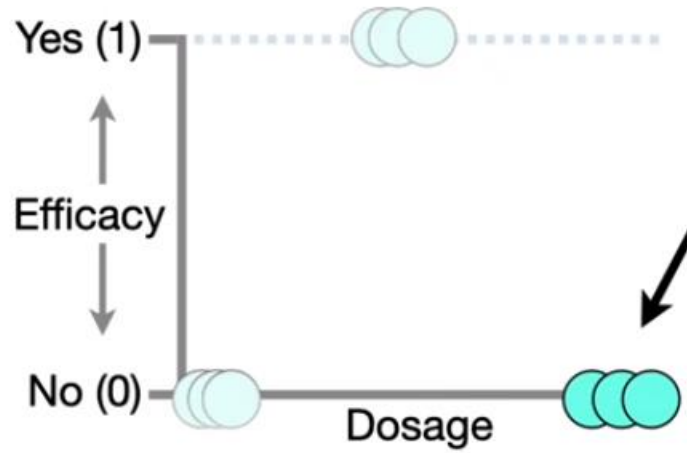


Low Dosage

Medium Dosage

High Dosage

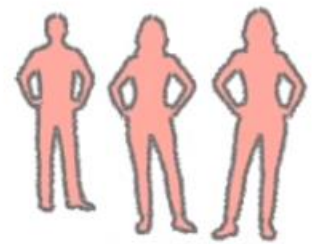
And the high **Dosages** were ***not Effective***, so those are set to **0**.

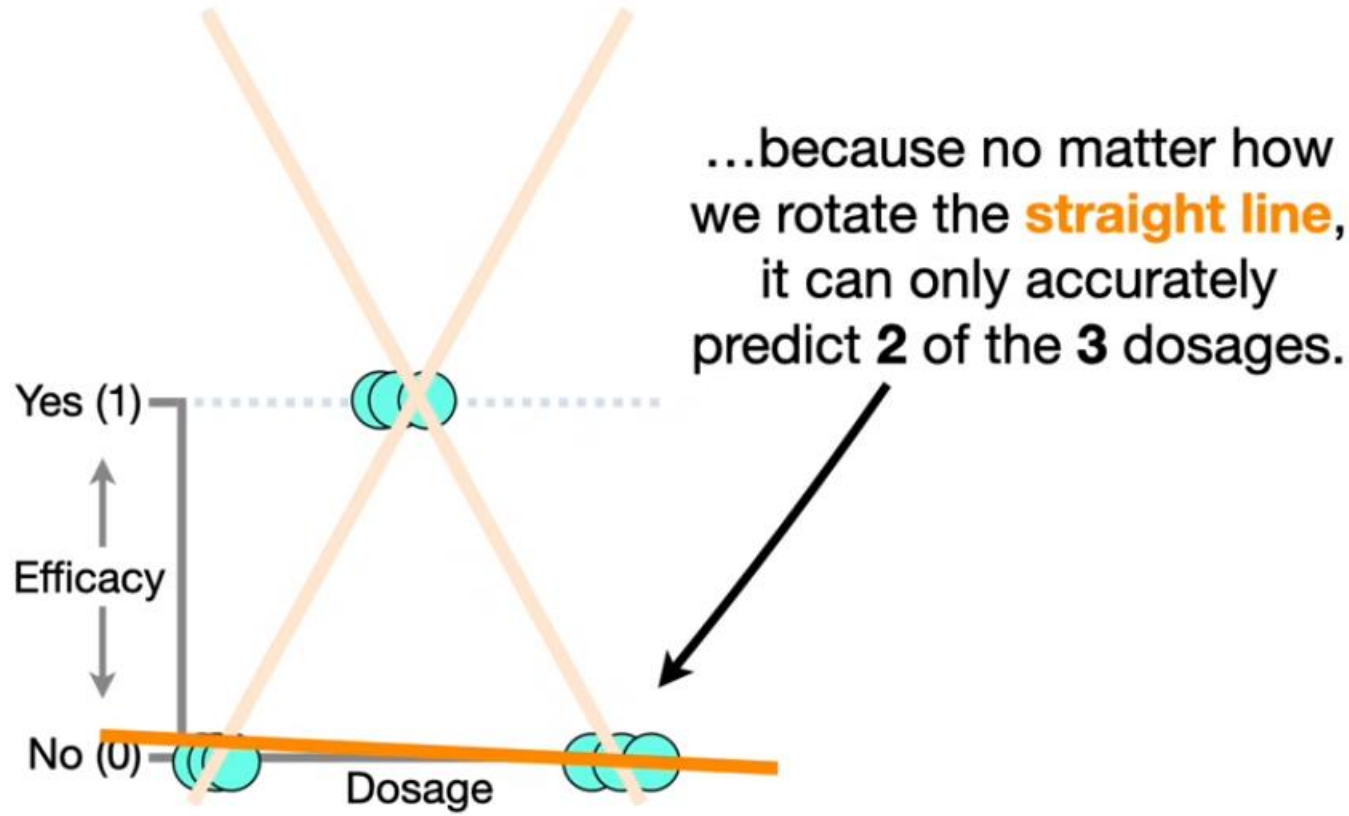


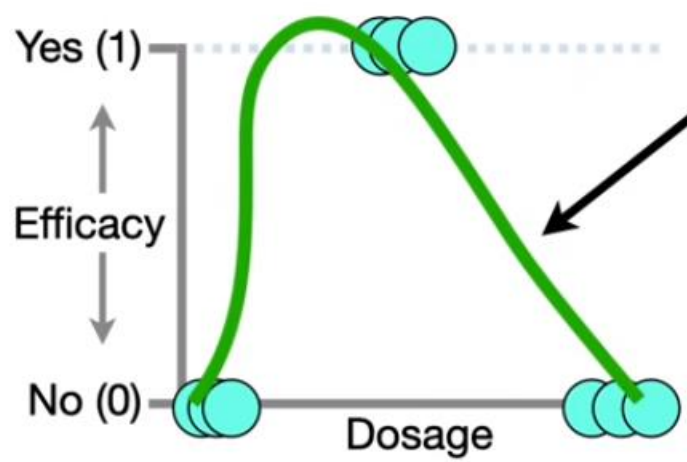
Low Dosage

Medium Dosage

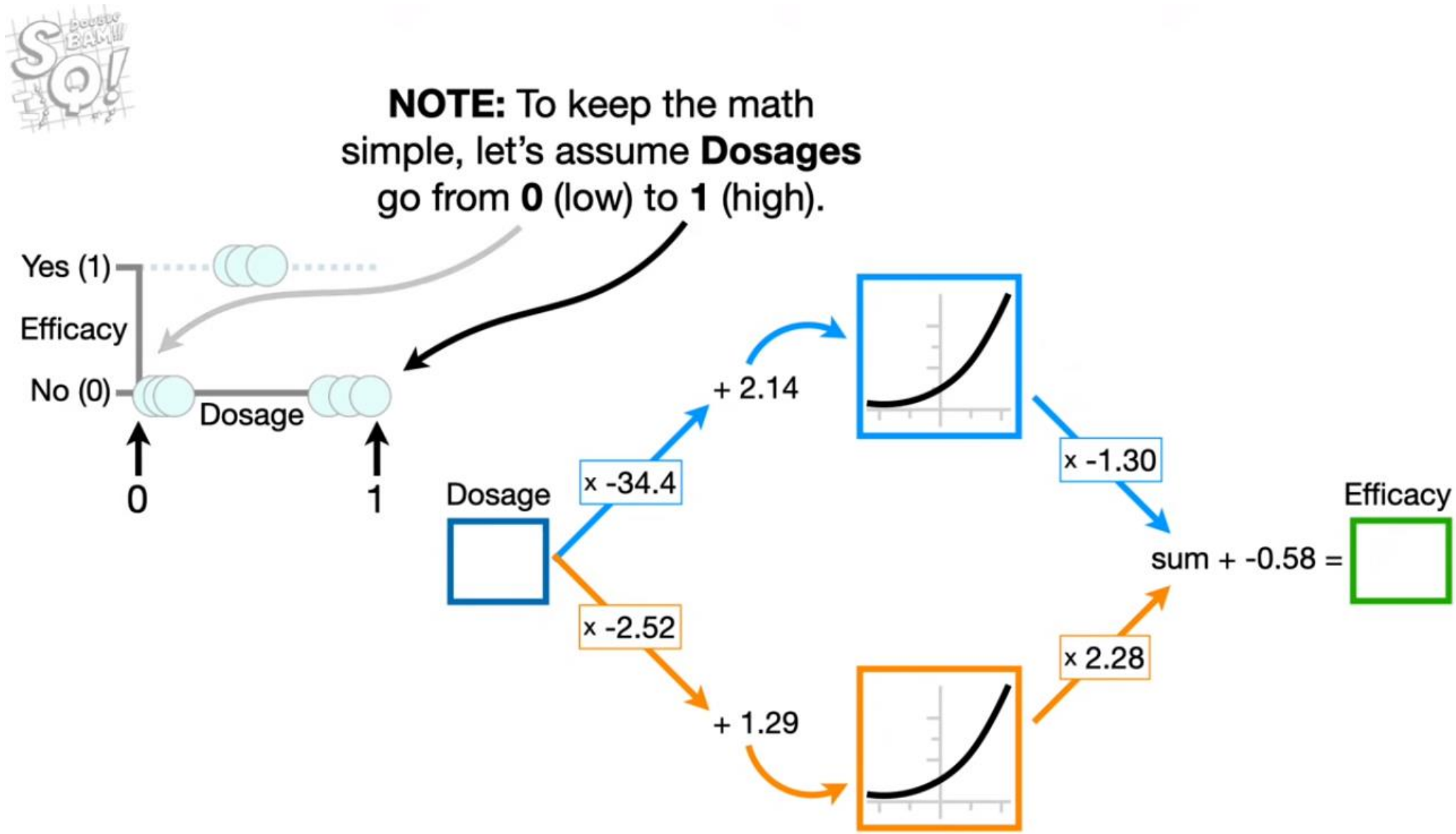
High Dosage




Yes (1)
Efficacy
No (0)
Dosage
…because no matter how we rotate the straight line, it can only accurately predict 2 of the 3 dosages.



The good news is that a **Neural Network** can fit a **squiggle** to the data.


NOTE: To keep the math simple, let's assume Dosages go from 0 (low) to 1 (high).
Yes (1)
Efficacy
No (0)
Dosage
0
1
Dosage
x -34.4
+ 2.14
x -1.30
x -2.52
+ 1.29
x 2.28
sum + -0.58 =
Efficacy

Instruksi

- Hitunglah Efektivitas (*Efficacy*) untuk tiga Dosis (*Dosage*) berikut:
  - Dosis = 0
  - Dosis = 0.5
  - Dosis = 1
- Dosis manakah yang paling efektif?

Catatan:

- Efektivitas rendah nilainya mendekati 0 (nol) dan sebaliknya efektivitas tinggi nilainya mendekati 1 (satu)
- Gunakan **softplus function** sebagai activation function
- Struktur Neural Network telah diberikan pada slide sebelumnya, beserta nilai **bobot** (*weight*) dan **bias**

Softplus Function

$$y = \ln(1+e^x)$$