



# Cześć!

## Krzysztof Bork-Ceszlak

Machine Learning Enthusiast, specialized in Deep Learning

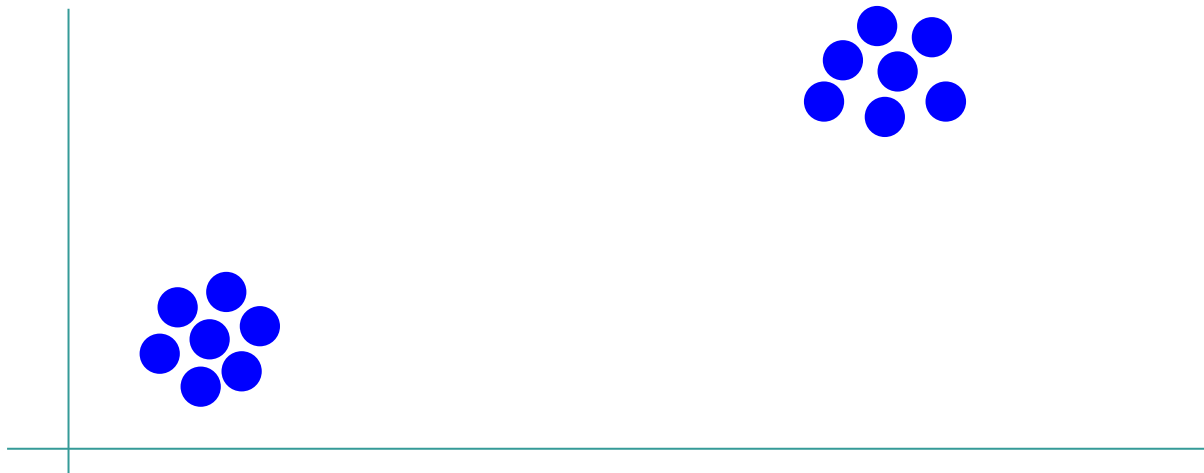
# Unsupervised Learning



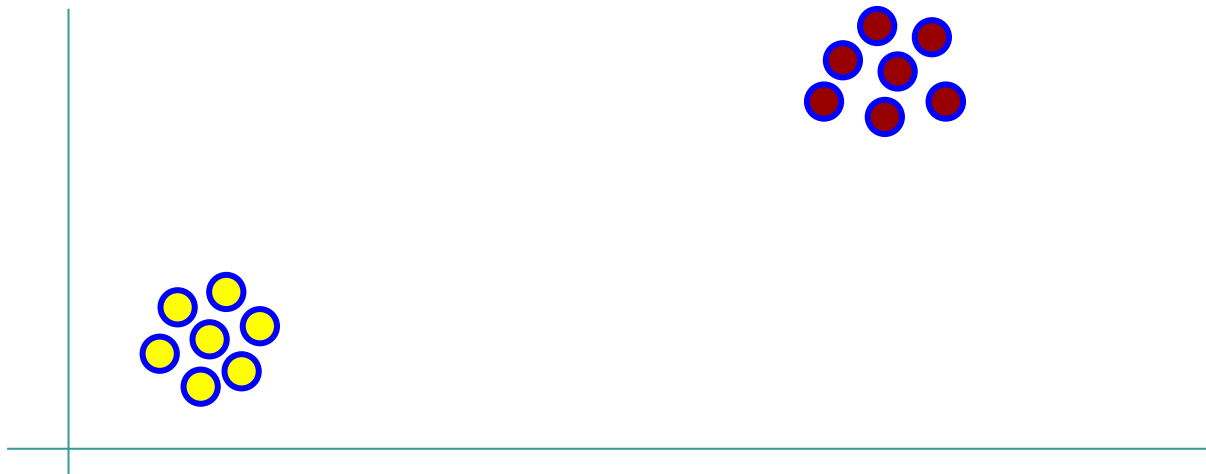
# Rozkład jazdy:

- Przypomnienie i problemy K-means
- Zastosowania głębokiego uczenia nienadzorowanego
  - Autoenkoder'y
  - Odszumianie
  - GAN

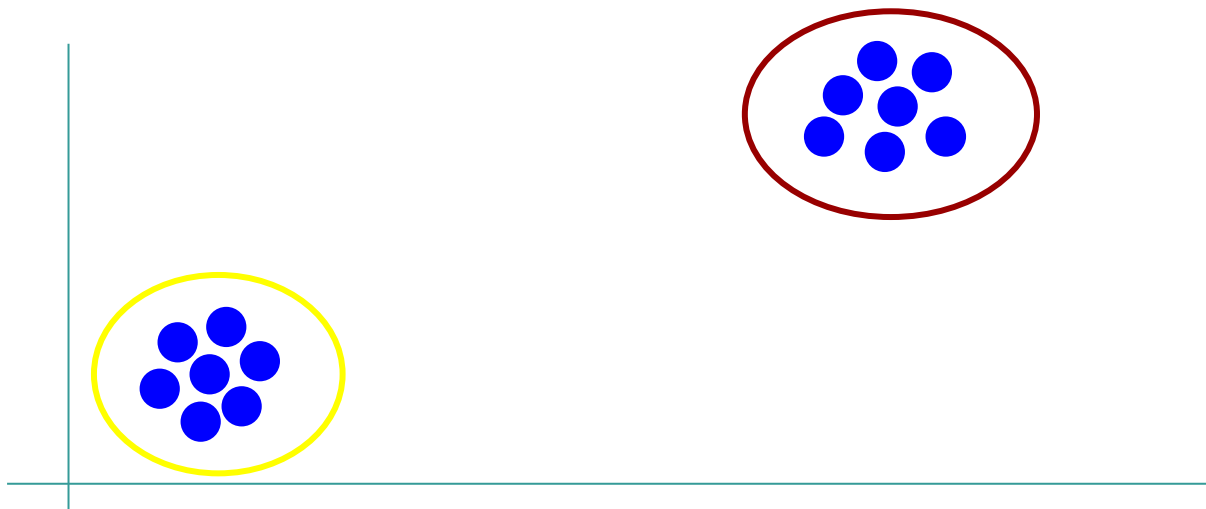
# Przypomnienie



# Przypomnienie uczenie nadzorowane

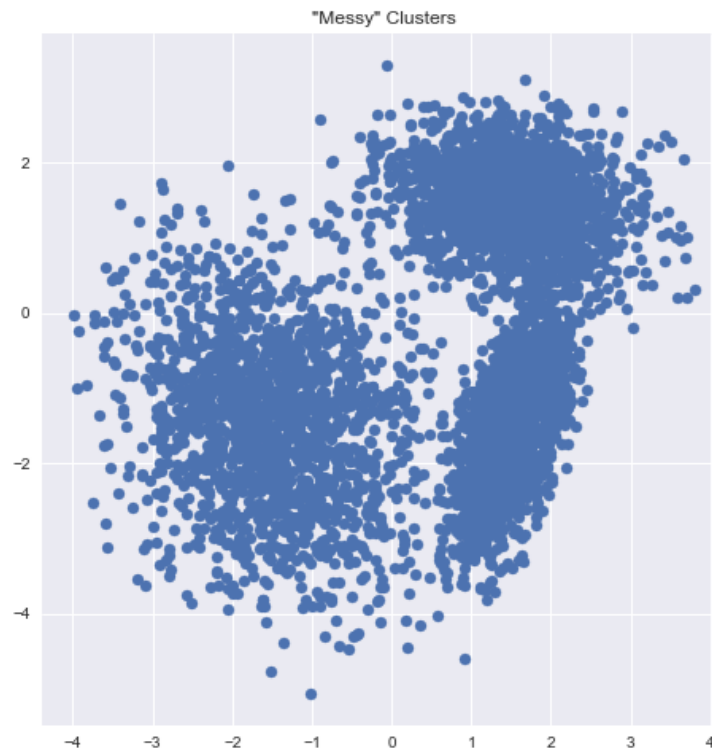
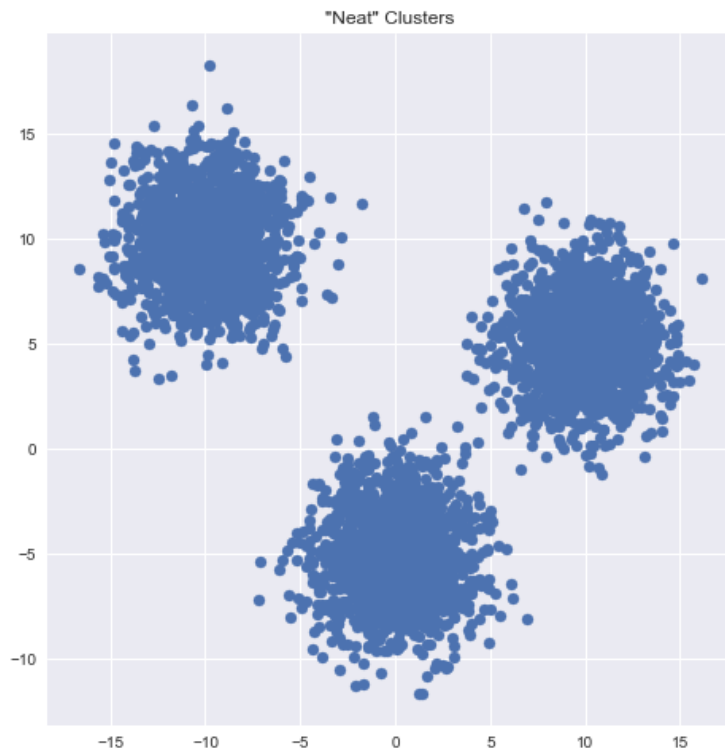


# Przypomnienie uczenie nienadzorowane



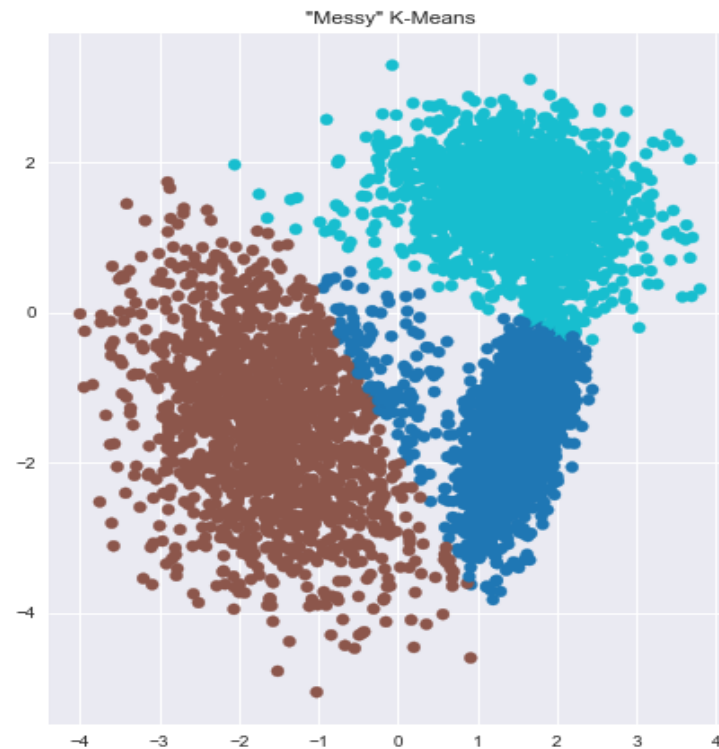
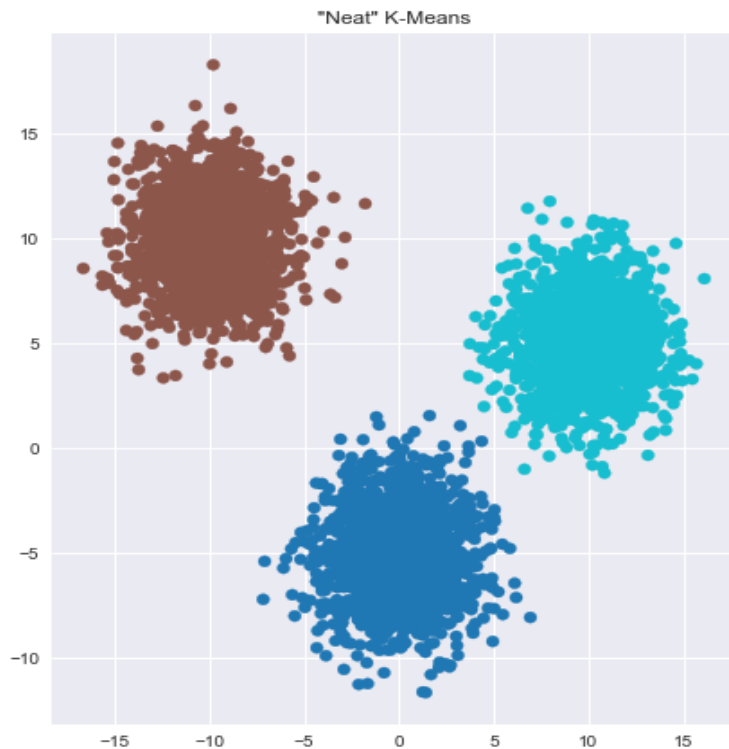
# Przypomnienie K-means

# Przypomnienie K-means





# Przypomnienie K-means



# Przypomnienie alternatywa?

# Przypomnienie

## Gaussian Mixture



# Po co uczenie głębokie?

# Zastosowanie

- Autoenkodery

# Zastosowanie

- Autoenkodery
- Klasteryzacja

# Zastosowanie

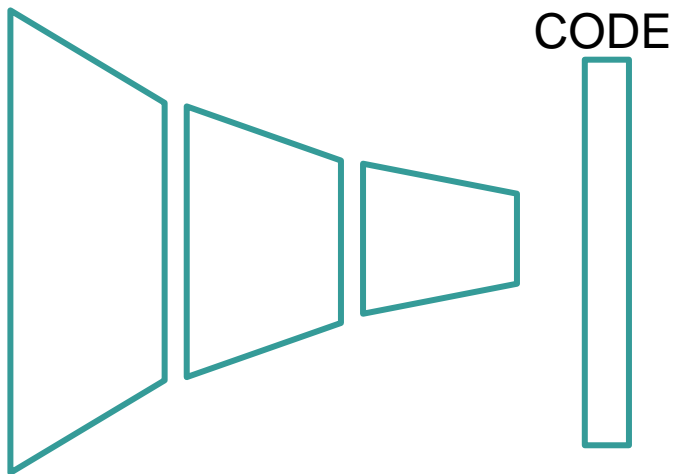
- Autoenkodery
- Klasteryzacja
- Odszumianie

# Autoenkodery

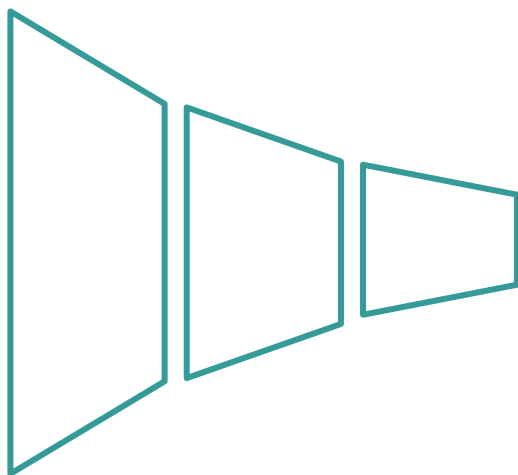




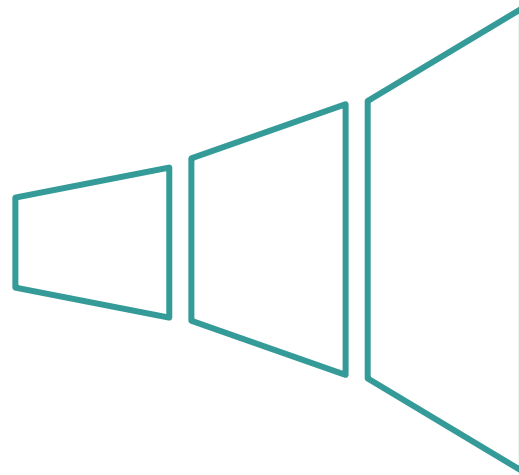
# Autoenkodery



# Autoenkodery

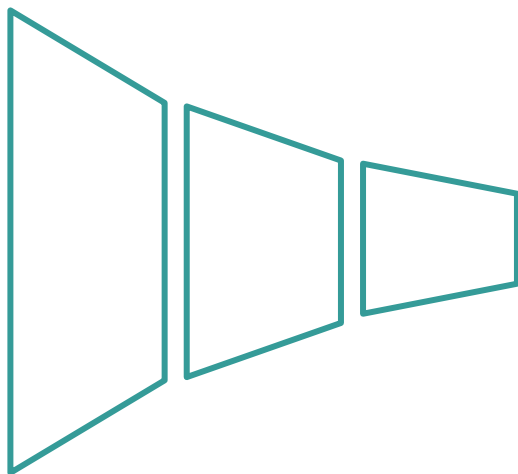


CODE

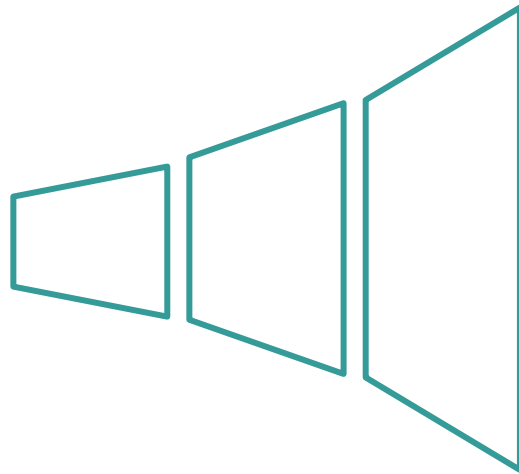


# Autoenkodery

100x200 => 20000 => 10000 => 5000 => 1000 => 5000 => 10000 => 20000 => 100x200



CODE



# Autoencodery

## Prosta sieć fully connected

# Autoencodery

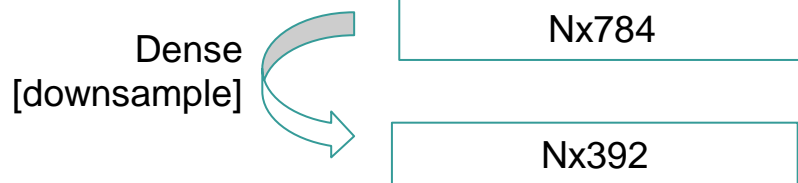
## Prosta sieć fully connected



Nx784

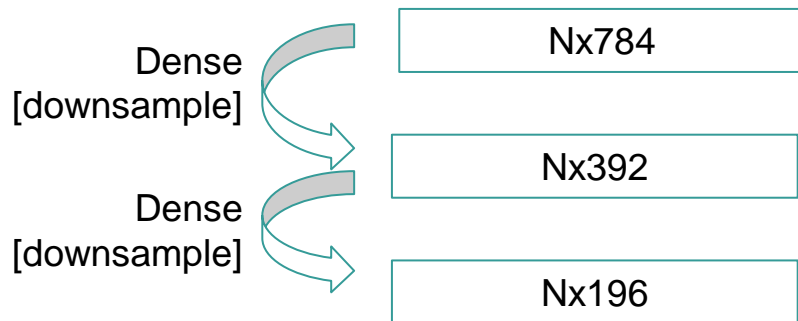
# Autoencodery

## Prosta sieć fully connected



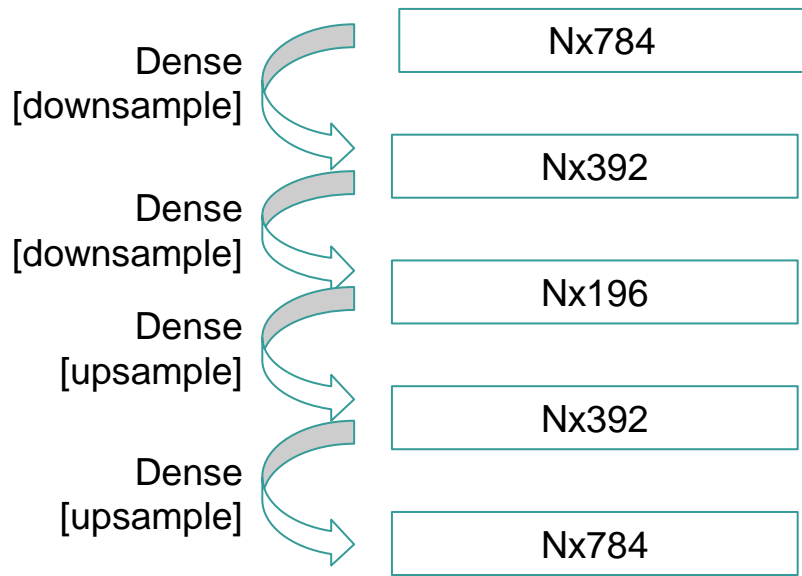
# Autoencodery

## Prosta sieć fully connected



# Autoencodery

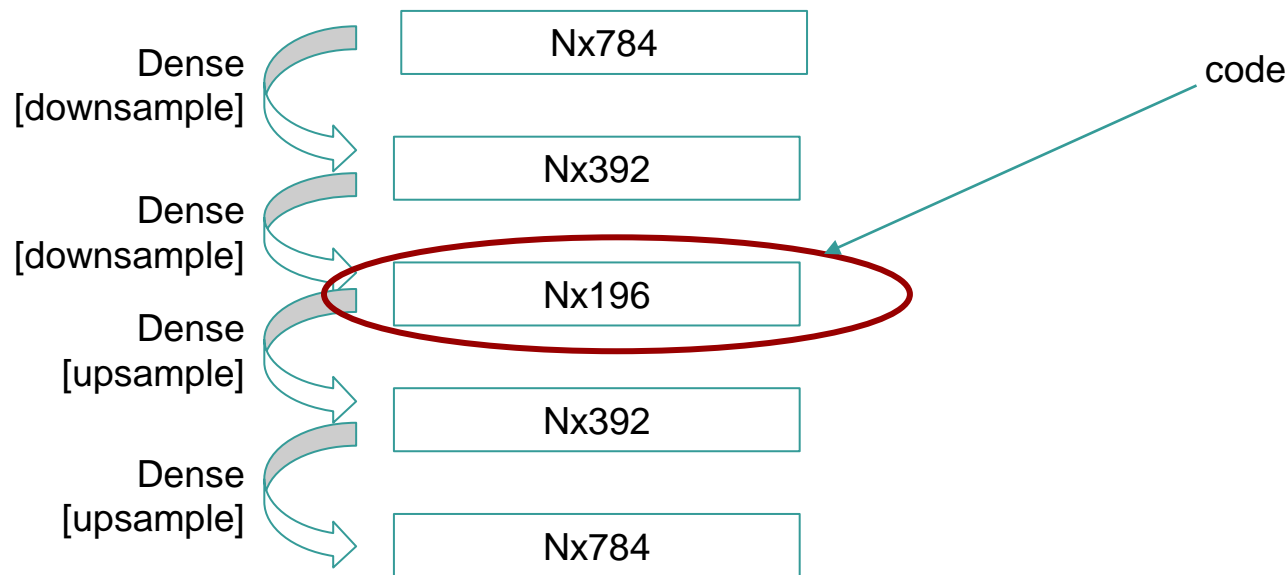
## Prosta sieć fully connected





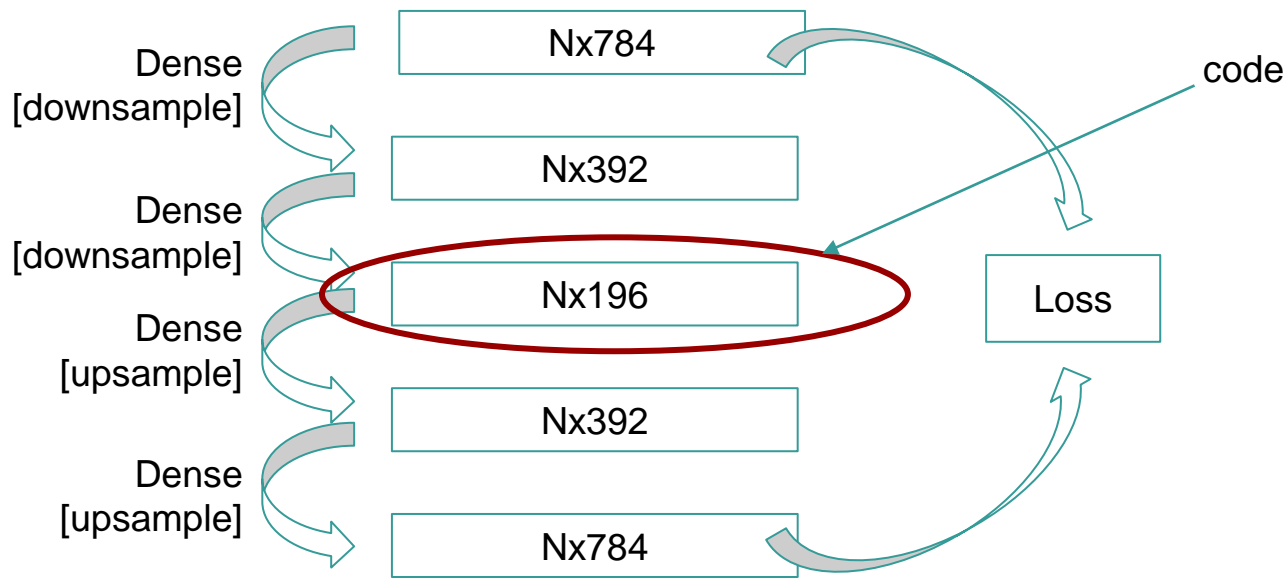
# Autoencodery

## Prosta sieć fully connected



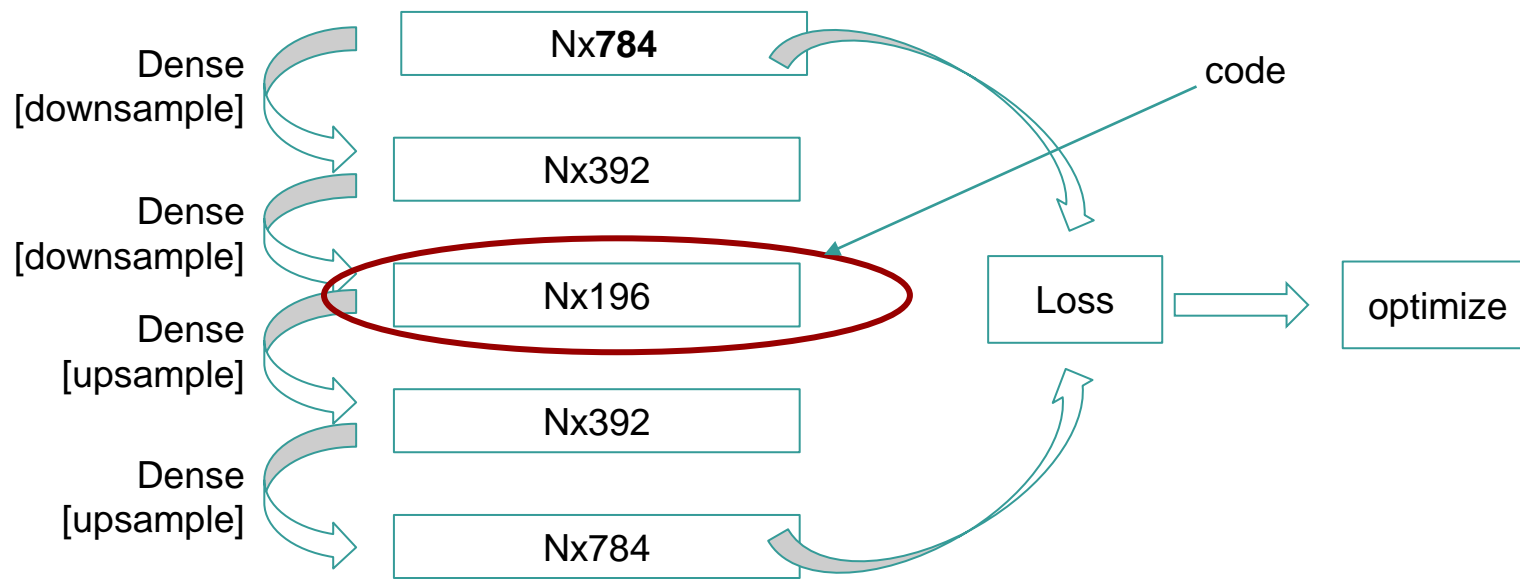
# Autoencodery

## Prosta sieć fully connected



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# Autoencodery

## Sieć konwolucyjna

# Autoencodery

## Sieć konwolucyjna

Nx784



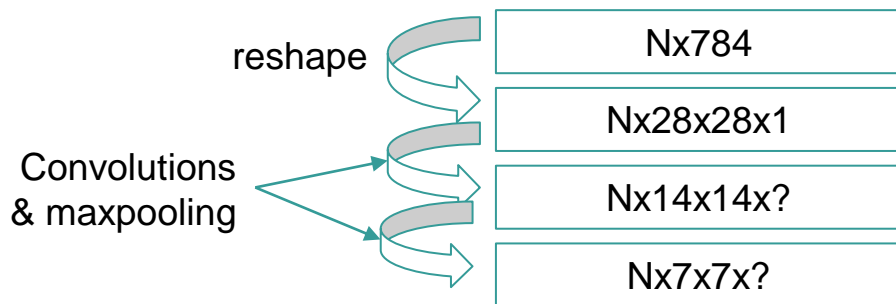
# Autoencodery

## Sieć konwolucyjna



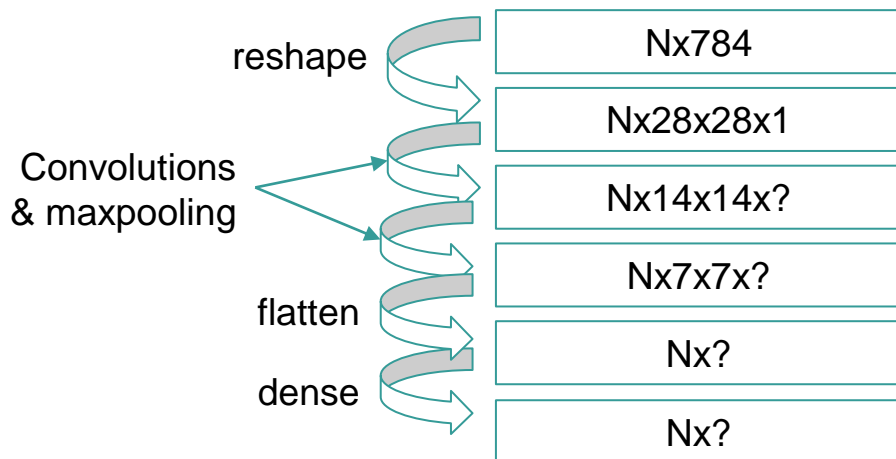
# Autoencodery

## Sieć konwolucyjna



# Autoencodery

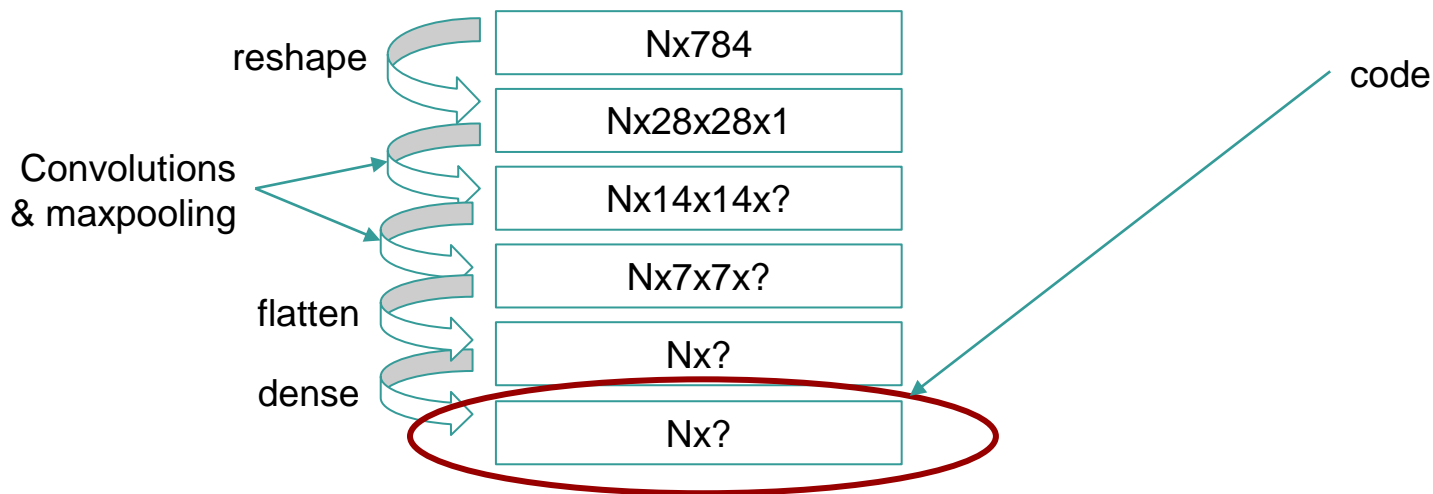
## Sieć konwolucyjna





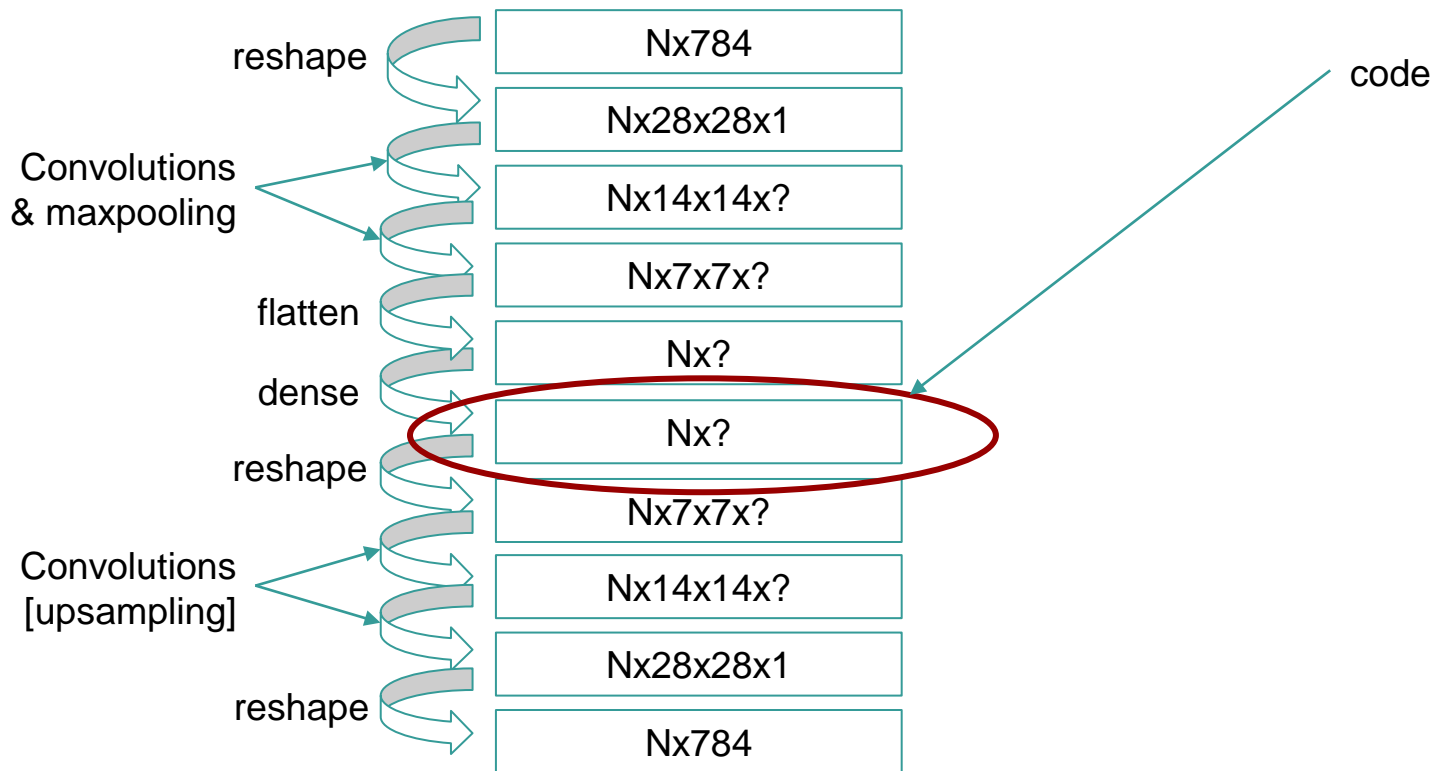
# Autoencodery

## Sieć konwolucyjna



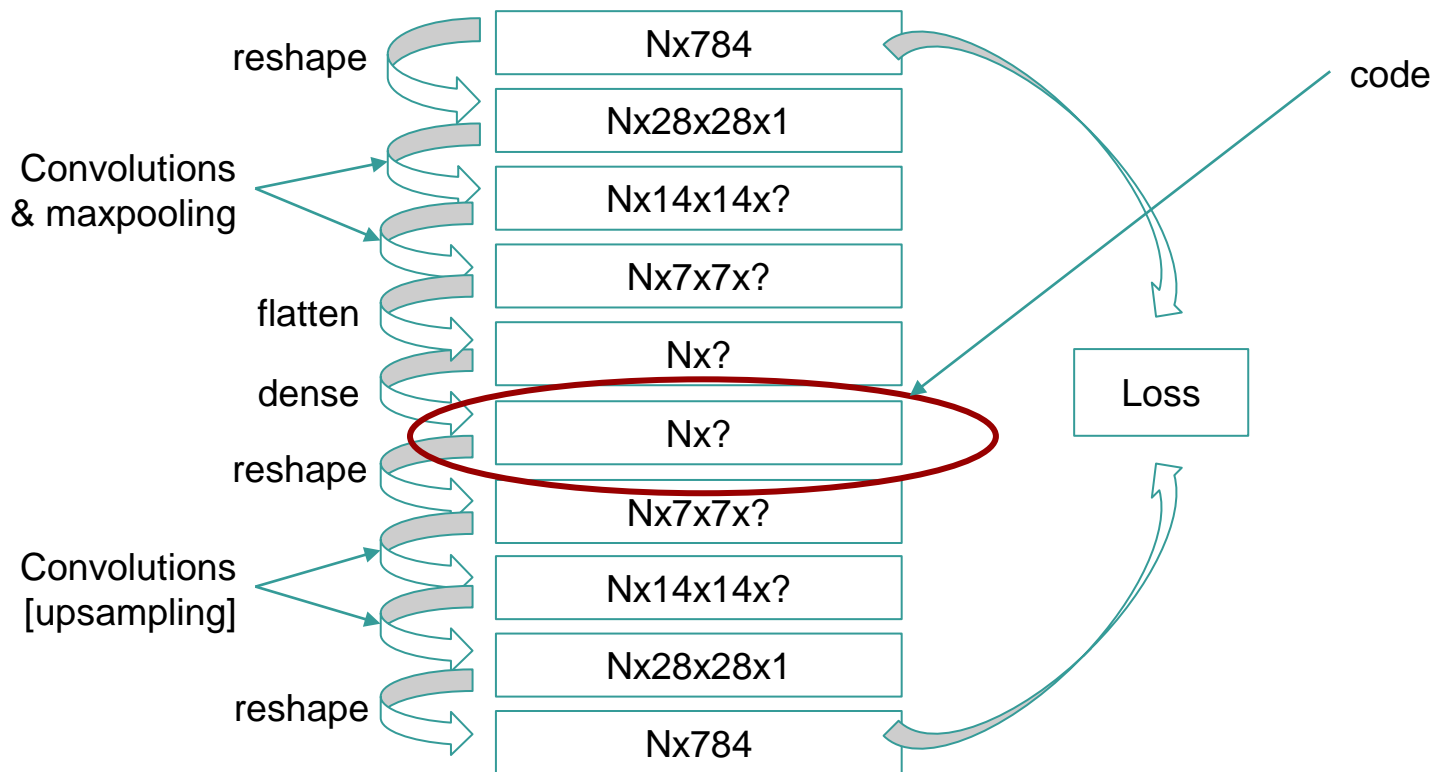
# Autoencodery

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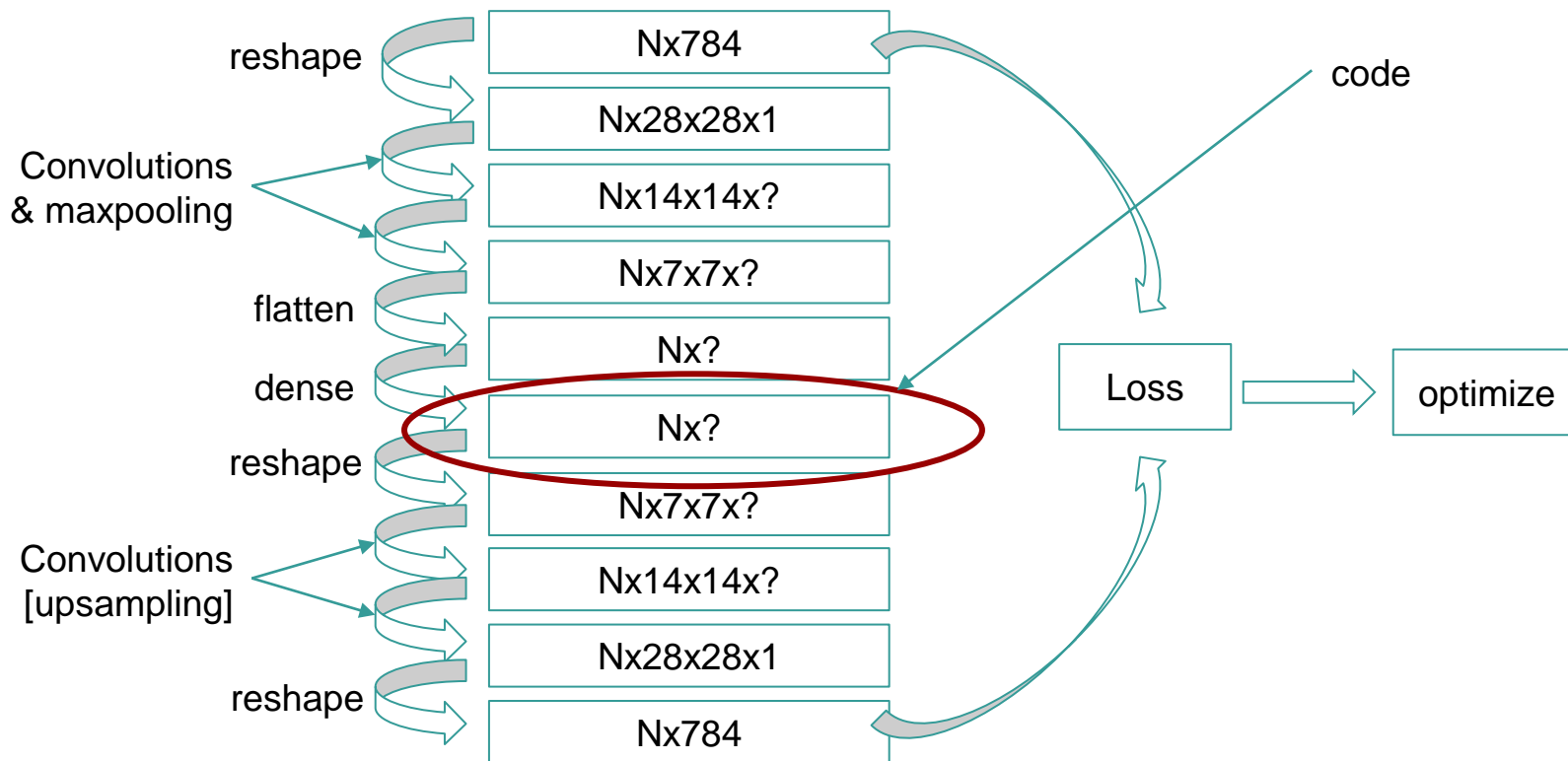
# Autoencodery

## Sieć konwolucyjna



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## Sieć konwolucyjna

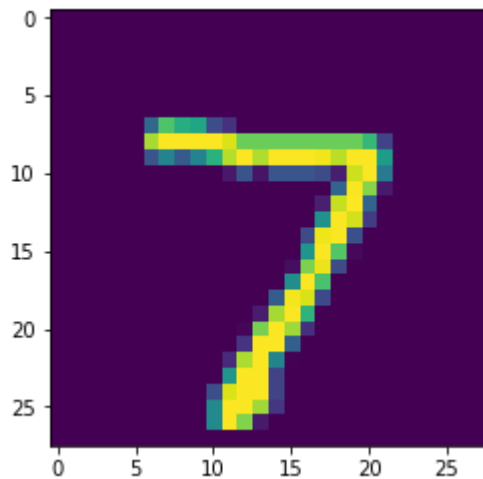


# Autoencodery

## Odszumianie

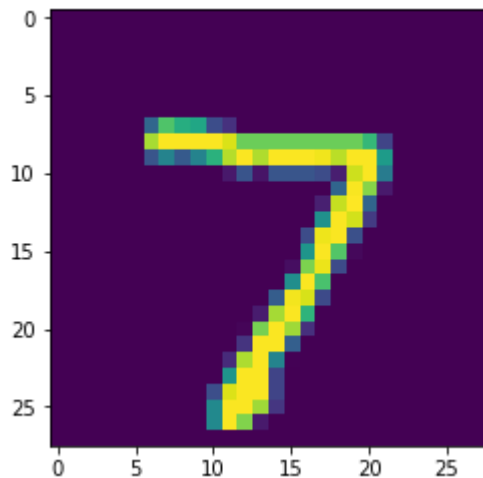
# Autoencodery

## Odszumianie



# Autoencodery

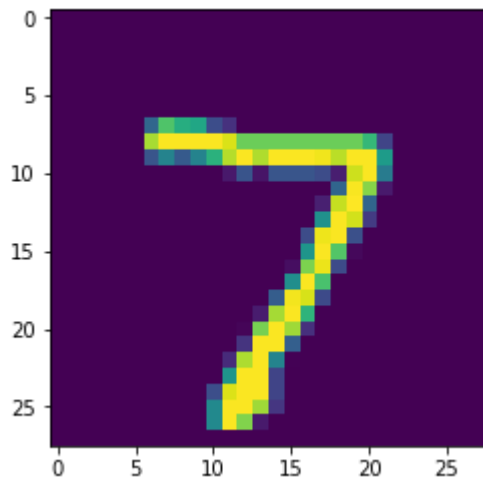
## Odszumianie



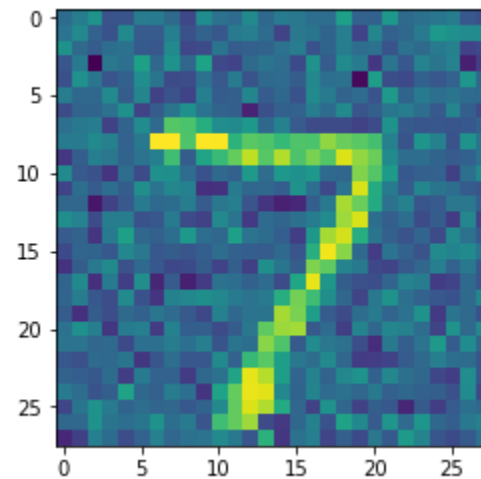
Add noise

# Autoencodery

## Odszumianie



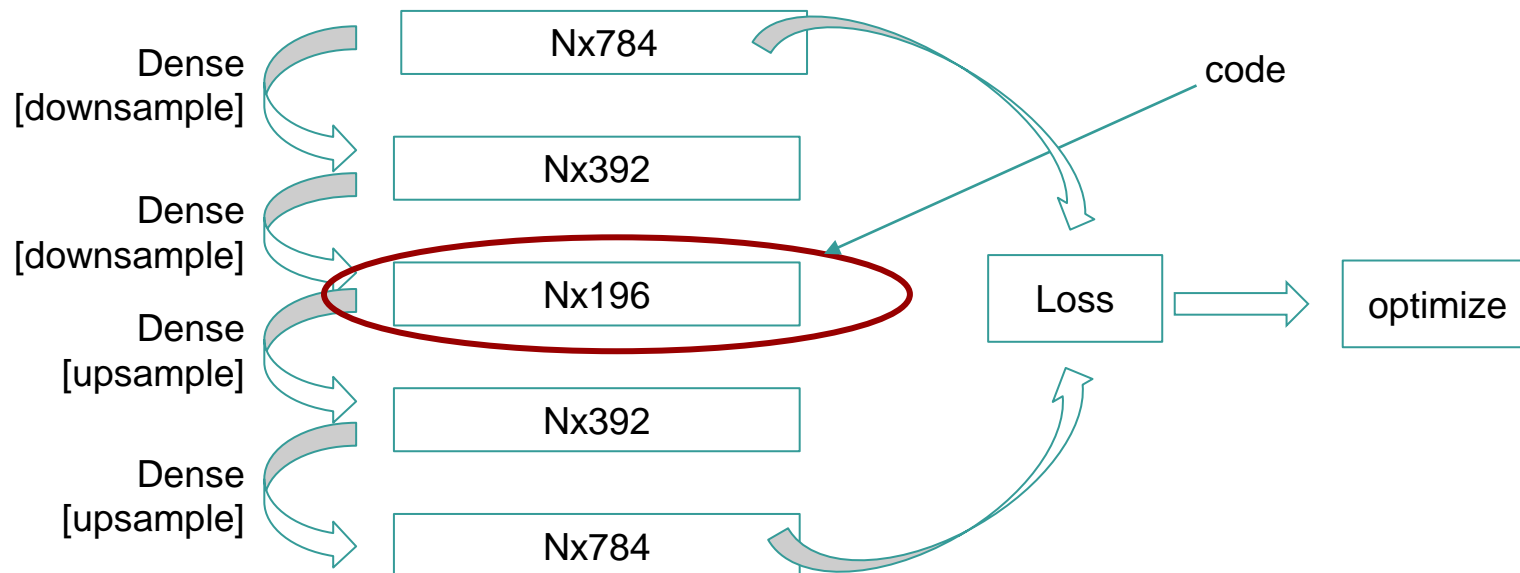
Add noise





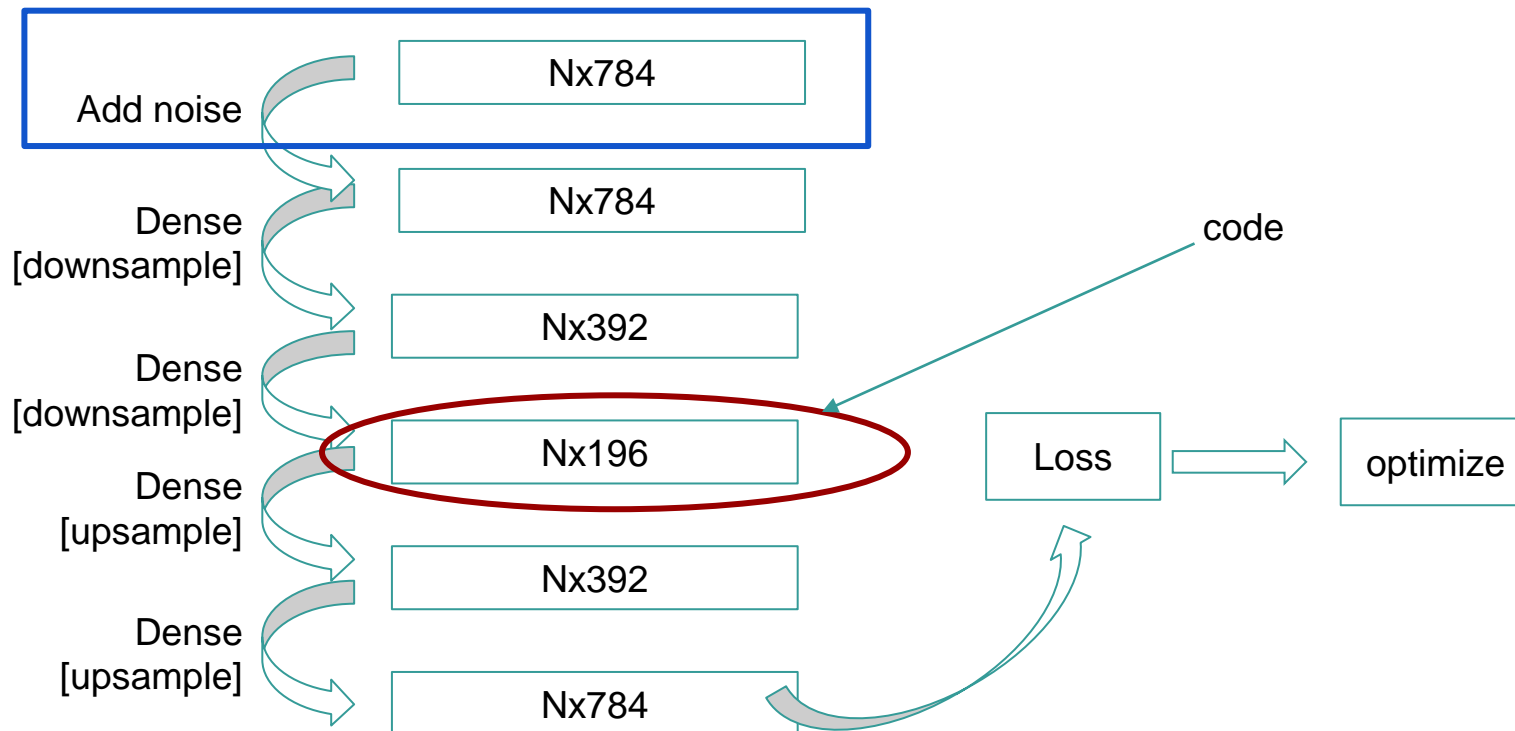
# Autoencodery

## Odszumianie



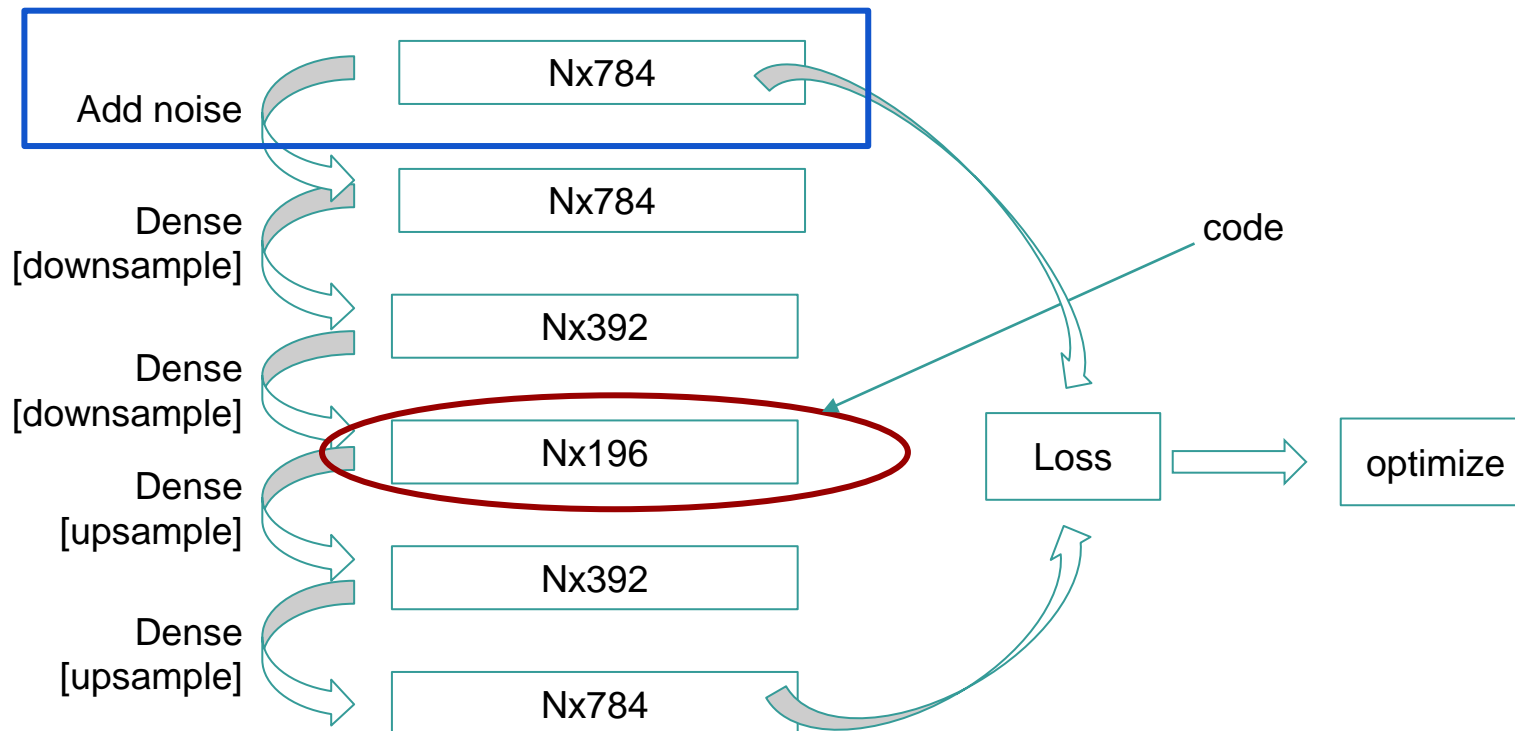
# Autoencodery

## Odszumianie



# Autoencodery

## Odszumianie

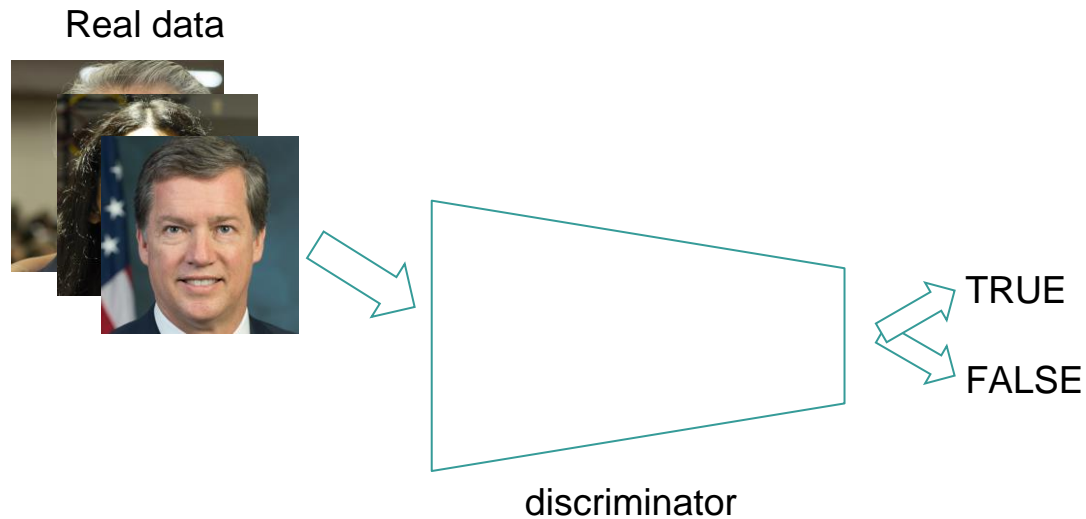


# Generative Adversarial Network

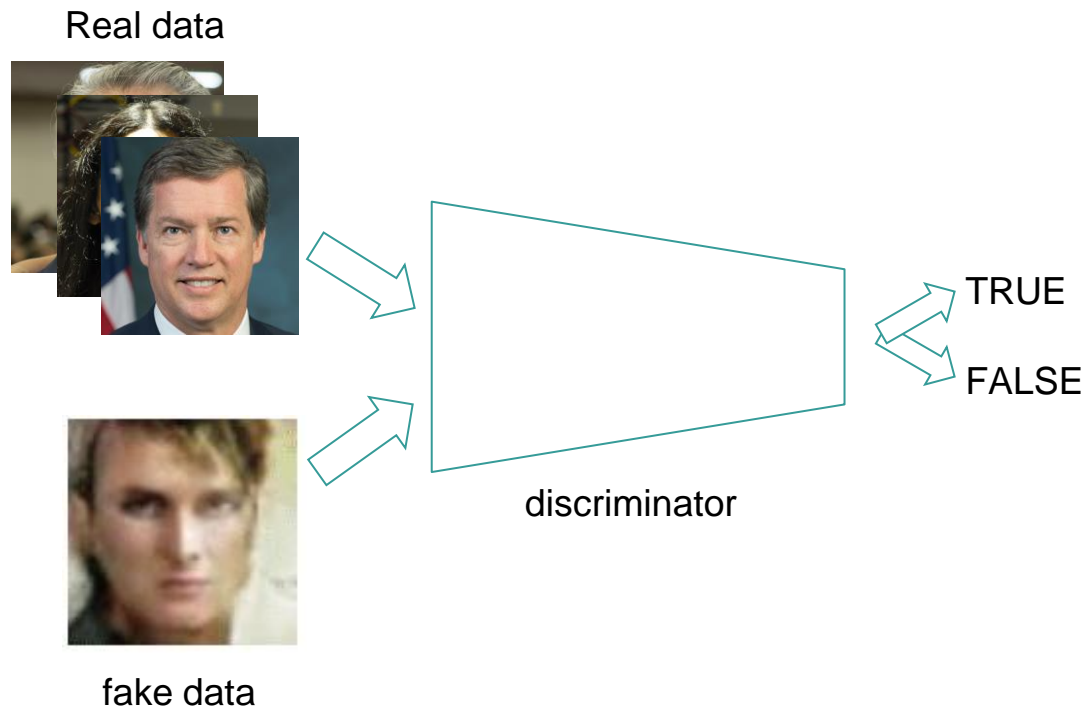
Real data



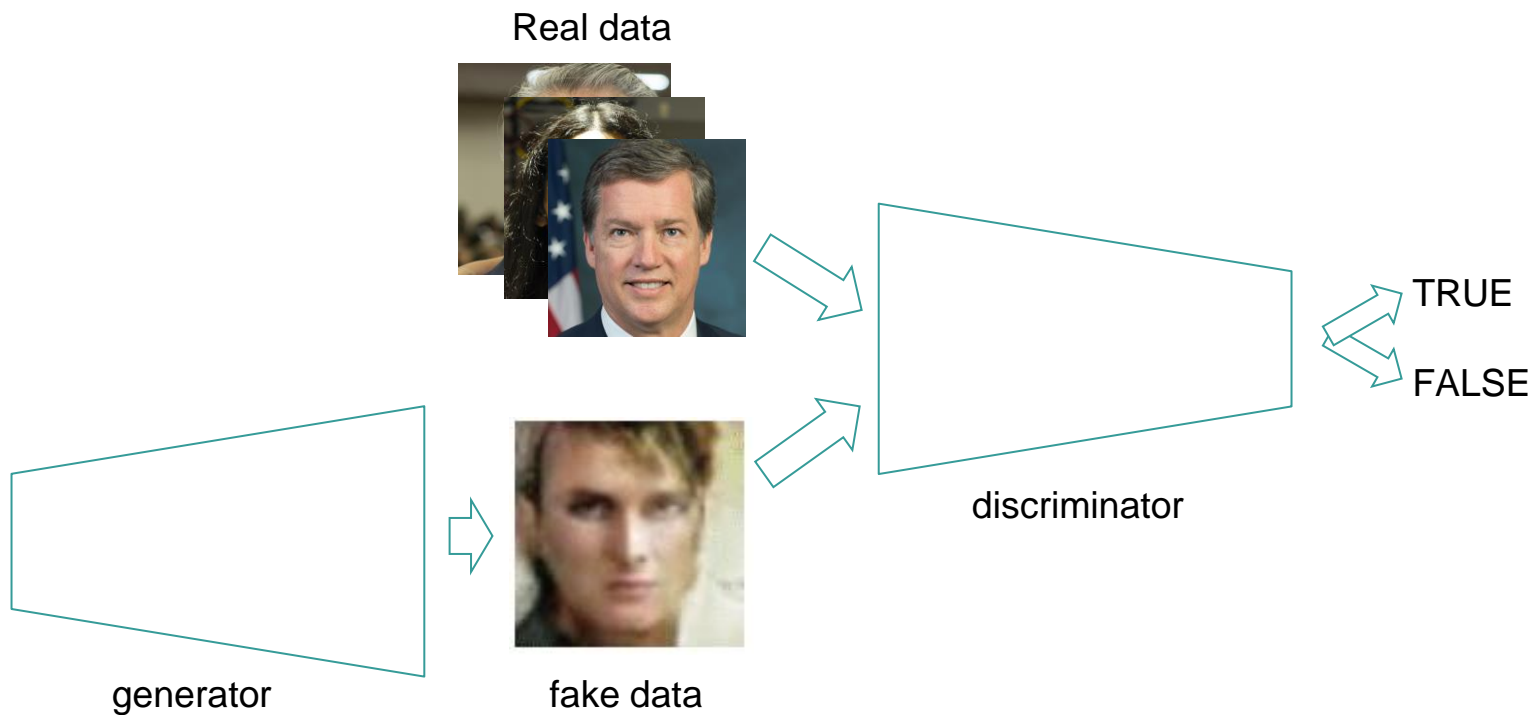
# Generative Adversarial Network



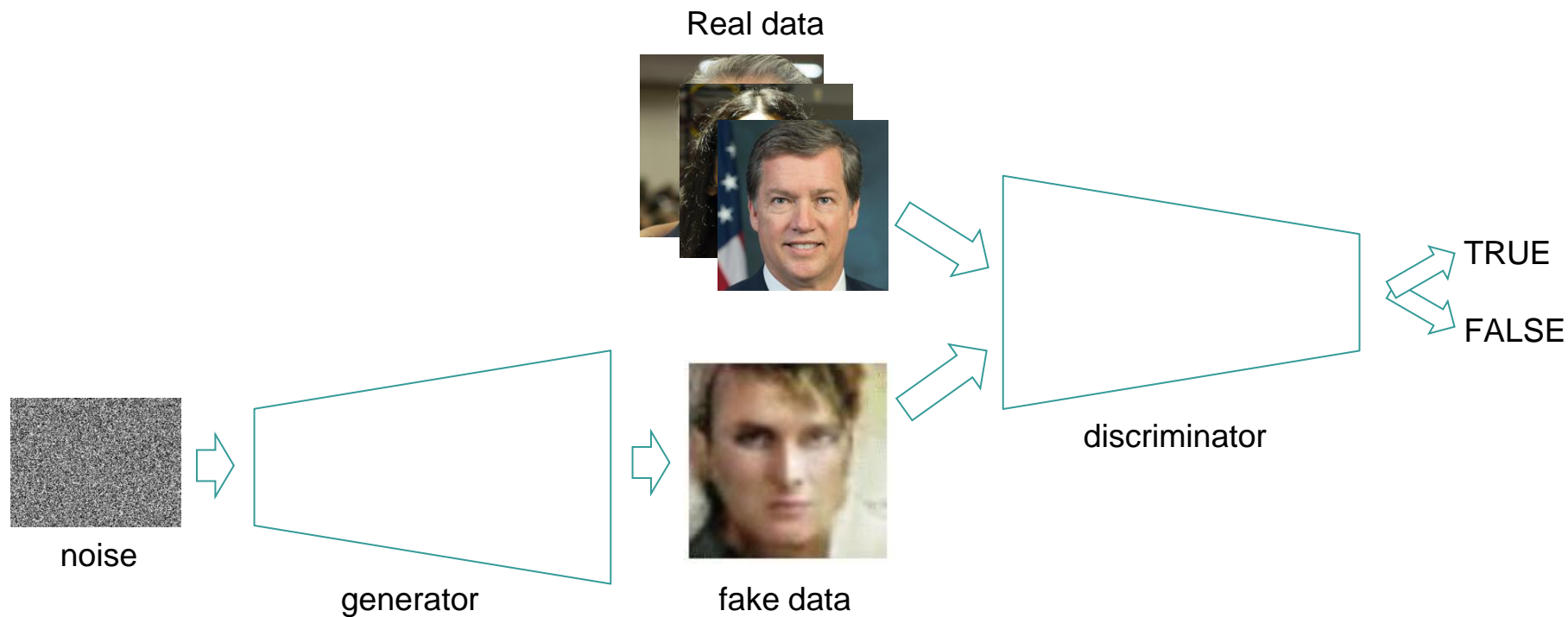
# Generative Adversarial Network



# Generative Adversarial Network



# Generative Adversarial Network







# Dzięki

You can find me at

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