

# Assignment 1

(Neural Networks Implementation and Application Tutorial)

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# Overview

- Assignment 1
- Time effort
- Current assignment (Assignment 2)
- QA

# Assignment Submission Deadline

Late submissions (>10mins) will not be accepted unless previously agreed upon!

- Mandatory groups of 2 (1 group of 3 as previously discussed)
- Usually 2-3 exercises per assignment + a possible bonus question
- Jupyter notebook templates
  - ▶ Assignment + solution in the same notebook
  - ▶ Can use Google Colab or local runtime
  - ▶ Write solutions in Python files and import them
  - ▶ Submitted notebook must only contain your analysis and outputs
- Only one submission per group
  - ▶ Submit through Teams

# Organization

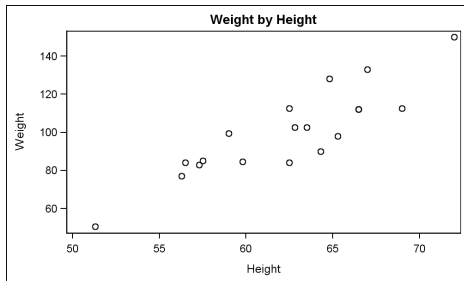
Questions?

# Assignment 1

- Questions?
- Did it work?
- How long did it take?

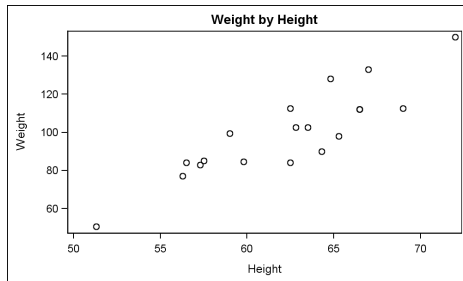
## Feedback:

- Change **TODO** to **Solution**.
- Don't forget to write amount of work.
  - ▶ Useful for our estimates of difficulty.



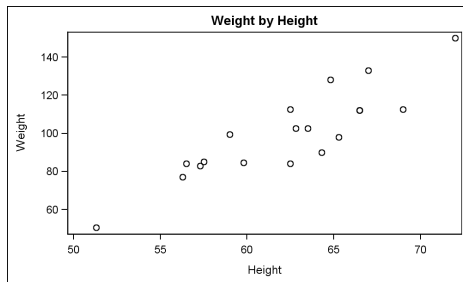
## Questions 🤔

- What will be the first principal component?



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- Does anyone know how PCA works?



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- What will be the first principal component?
- Does anyone know how PCA works?
- What does it mean that we take only  $k$  largest principal components?

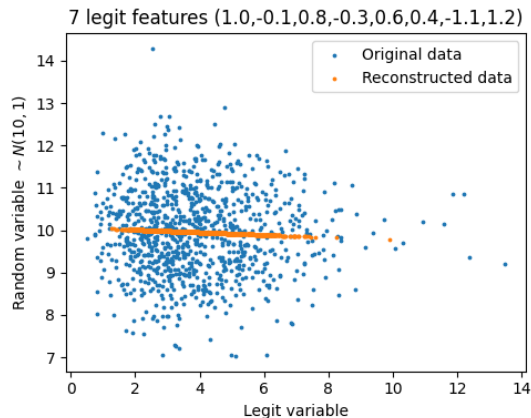
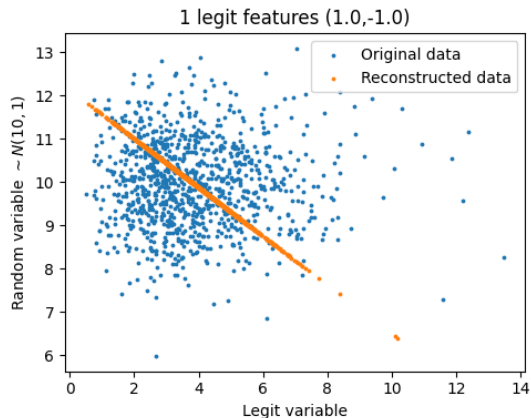


# PCA

- Is it safe to say that the first component will always contain the most important information? 🤔

# PCA

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# Standardization

- Is not normalization! ( $x' = \frac{x}{|x|}$ )
- $X = \frac{X - \text{mean}(X)}{\text{std}(X)}$
- Compute either:
  - ▶ With Numpy: `X = (X-X.mean())/np.std(X)`
  - ▶ With Scikit: `StandardScaler().fit_transform(X)`
- Why do we need standardization for PCA? 🤔

# Assignment 2

- Any questions?

# Resources

- ① Course Website:  
[lsv.uni-saarland.de/neural-networks-implementation-and-application-winter-2021-2022-2](https://lsv.uni-saarland.de/neural-networks-implementation-and-application-winter-2021-2022-2)
- ② Piazza: <https://piazza.com/class/kvc3vzhsvh55rt>
- ③ Tutorial repository [github.com/zouharvi/uds-nnia-tutorial](https://github.com/zouharvi/uds-nnia-tutorial)
- ④ Lecture & tutorial teams channels