Regression + Assignment 1

(Neural Networks Implementation and Application Tutorial)

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Overview

- Assignment 1
- Regression
- Assignment 2

Assignment 1

Organization

- Late submissions (>10mins) will not be accepted unless previously agreed upon
- Other questions?
- How long did it take?

Notes

- Very nice solutions! (average TODO)
- Reconstruction error on original space, not standardized (we did the same mistake 🙃)

Assignment 1

- *Tutor cue:* go through the assignment
- Questions?
- Did it work?
- Were you able to collaborate?

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Which of the following are regression (and linear/polynomial) models? 🧐 1. 5

2. $4 \cdot x_1 + 5$
3. $4 \cdot x_1 + 3 \cdot x_2^2 + 5$
4. $4 \cdot x_1 + 3 \cdot x_1 \cdot x_2 + 5$
5. $4 \cdot x_1 + 3 \cdot \sin(x_2^2) + 5$
6. $\begin{cases} 4 \cdot x_1 + 5 & \text{if } x_2 \geq 10 \\ 3 \cdot x_1 + 4 & \text{if } x_2 < 10 \end{cases}$

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Regression to Classification 🤔 🤔

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  - Softmax: $\frac{\exp x_i}{\sum_k \exp x_k}$

Loss & Regularization

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  - We care about points that are drastially mispredicted, e.g. $L_2(-1, 10)$ and not about almost correctly predicted instances $L_2(-1, -1.1)$

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- ElasticNet regression uses both: *minimize* $\arg\min L_2^2(\hat{Y}, Y) + \lambda_1||\beta||_1 + \lambda_2||\beta||_2^2$

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- Large variance corresponds to . . . ?
  - Overfitting

Assignment 2

- Any questions?

Resources

TODO