

26.04.22

Machine Learning With TensorFlow

INTRODUCTION TO TENSORFLOW PART I

- **Quiz**
- **Assignments**
- **Breakout Discussions**
- **Questions**
- **Projects**

QUIZ



<https://forms.office.com/r/GYtygvr1kU>

ASSIGNMENTS

**ASSIGNMENTS: WHO WILL PRESENT
NEXT?**

BREAKOUT DISCUSSIONS

- **The second exercise was a multi-class classification.**
 - **Where in the model creation and compilation process can we see this?**
 - **What could you change in the model architecture to improve**

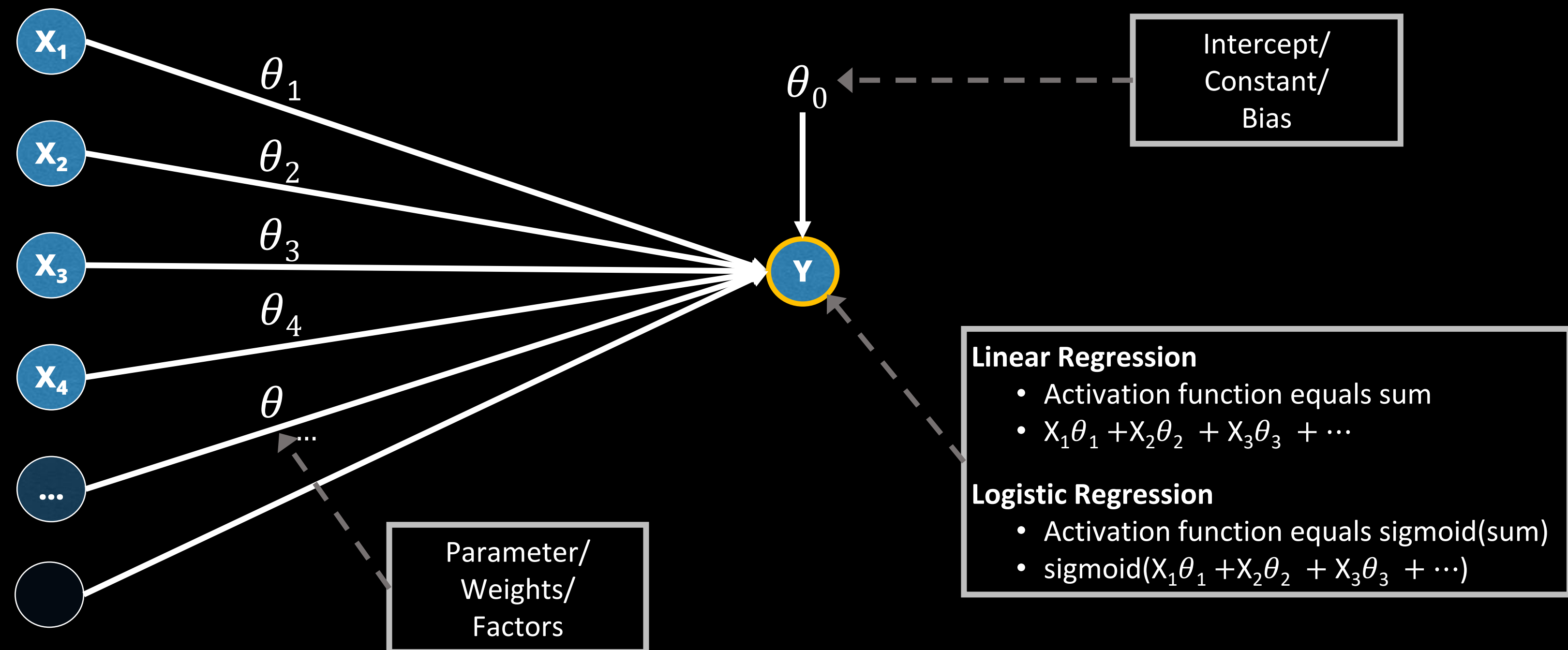
```
# Build the classification model
model = tf.keras.models.Sequential([tf.keras.layers.Flatten(),
                                     tf.keras.layers.Dense(128, activation=tf.nn.relu),
                                     tf.keras.layers.Dense(10, activation=tf.nn.softmax)])
```

- **Why is it usually beneficial to adjust the features and labels of the network to values between 0 and 1 or at least relatively close to zero?**
- **What is the difference between the approach used in Exercise 1 and a linear regression?**

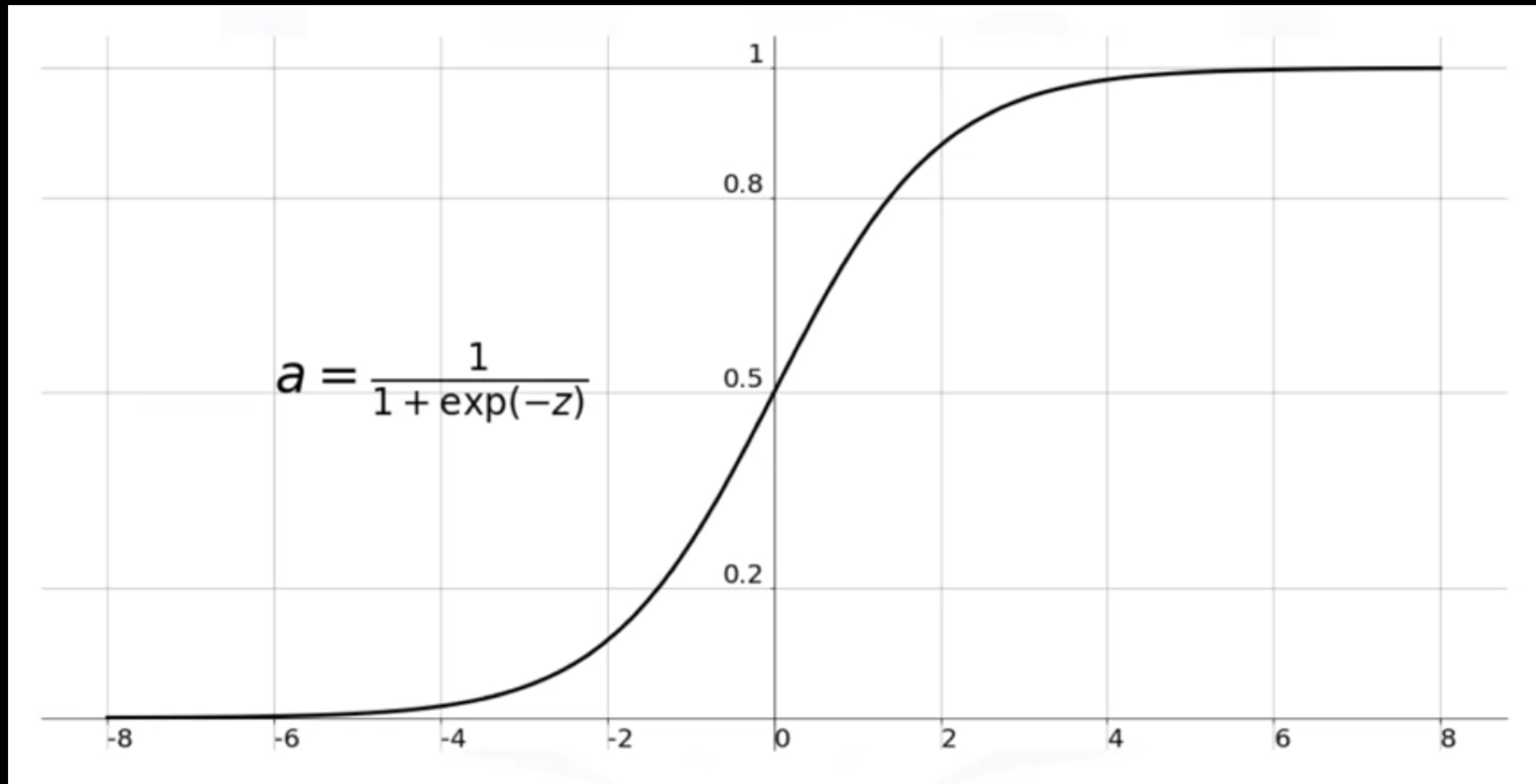
NEURAL NET VS. REGRESSION

Input Layer
with input variables/ input
features/ input dimensions

Output Layer
summarizing the thetas by applying
an „*activation function*“



SIGMOID FUNCTION




BREAKOUT DISCUSSIONS

- **Assume you have the labels 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 describing the age of a product in years and features like color, noise, and speed of the product (which change with the age).
How would you define the output layer of your model?**

PROJECTS

- **If you have a project idea, please create a chat channel with Steffen and Jan to pitch your idea so that we know about it and can discuss feasibility/issues**
- **Next week: All project ideas are pitched**


PROJECT EXAMPLES

 OC ML Degree

Deep Learning

Tensorflow

Natural Language Processing

GitHub Repo 



Iceberg and Ship Detection in Radar Satellite Imagery (WiSe 20/21)

Eike Schütt, Yi-Jie

This project is aimed at building an algorithm able to detect for SAR imagery which finds and classifies ships, icebergs or unidentified objects.

Check out the Project!



Classification of illustrations in historic monographies (WiSe 20/21)

Irena Kampa

Digitalizing old collections makes them available to a worldwide public. This project trains a CNN to identify illustrations in monographies from the 15th to the 18th century.

Check out the Project!



Writing System Recognition (WiSe 20/21)

Manpreet Singh, Adnan Nooruddin, Rahima Akter, Sebastian Koch

Can we detect different language from an image? Here a classifier which is able to distinguish Latin, Chines, Kyrillic and Georgian!

Check out the Project!



<https://opencampus-sh.github.io/oc-ml-projects/>

PROJECTS: MILESTONES

- **10.05. Form groups**
- **17.05. Literature review**
- **24.05. Dataset characteristics**
- **07.06. Baseline model**
- **14.06. TensorBoard**
- **21.06. Model & model evaluation**
- **28.06. Project presentations**

TASKS UNTIL NEXT WEEK

- **If you have a project idea: Let Steffen and Jan know**
- **Completion of the learning material of week 3 and 4 of the course "introduction to TensorFlow"**
- **Complete Exercises 3 and 4 of the above course**