

19.04.22



Machine Learning With TensorFlow

INTRODUCTION TO NEURAL NETS

INTRODUCTION

- **Organizational Matters**
- **Introductory Discussion on AI**
- **Coursera Registration**
- **Course Projects**
- **Neural Net Basics**

CHAT

The screenshot shows a Slack channel interface. At the top, there's a header bar with the channel name "C_Machine Learning With TensorFlow" and a star icon. Below the header, a message from "sose21" (@steffen) says "Tuesday, 4-6 p.m.: Zoom; Course Handbook". To the right of the header, there's a search bar and some user icons.

The main area of the channel has a dark background. On the left, there's a sidebar with a "Find channel" input field and a list of channels: "00 - Announcements", "01 - Questions", "C_Advanced Machine Lear...", "C_Deep Learning from Scr...", "C_Einführung in Data Scie...", "C_Machine Learning für di...", "C_Machine Learning With ...", and "Kursleitungen". The "C_Machine Learning With ..." channel is currently selected, highlighted by a yellow arrow pointing to its name in the sidebar.

The main content area features a large heading "Beginning of C_Machine Learning With TensorFlow". Below it, a message from Steffen Brandt on March 02, 2021, reads: "This is the start of the C_Machine Learning With TensorFlow channel, created by Steffen Brandt on March 02, 2021. Any member can join and read this channel." There are buttons for "Invite others to this channel" and "Set a Header".

On the right side, under "Pinned Posts", there's a pinned message from Steffen Brandt on March 25, 2021, which reads:

C_Machine Learning With TensorFlow

Steffen Brandt 23:10 Welcome to the course "Machine Learning With TensorFlow"! In this course we will try to provide you with hands-on knowledge about how to train machine learning models with TensorFlow. An important part when working in the field of machine learning is networking and working together in a team. An important goal of the course is therefore that you get to know each other and work in a team on a project. I would therefore like to ask you to introduce yourself quickly here in the channel already. Maybe

- Please, ask questions to us in the chat

COURSE HANDBOOK

 opencampus.sh Machine Learning Program

EDU-Platform Chat

Search...

opencampus.sh Machine Learning Program

Course Kick-Off

How do I choose a course?

FAQ

COURSES

Einführung in Data Science und maschinelles Lernen >

Machine Learning With TensorFlow ▾

- Requirements for a Certificate of Achievement or ECTS
- Preparation

[Week 1 - Introduction to Neural Nets](#)

Week 1 - Introduction to Neural Nets

This week you will...

- get a basic introduction to neural nets in order to get an intuition for the technical terms used in training them
- get an introduction to the tools that we use during the course and that you will need for your practical project

Learning Resources

 [Course Presentation](#) 201110_Introduction to Neural Nets and Tools.pdf - 4MB

- Video [Neural Networks Explained](#) (12 minutes)

CONTENTS

This week you will...

Learning Resources

Until next week you should...

ZOOM

- Try the different viewing modes:
 - Gallery View/ Active Speaker
 - Split Screen/ Full Screen Mode
- Maybe watch this video to get an idea:
<https://www.youtube.com/watch?v=v3IPAbpVjd4>

The screenshot shows the Zoom Meeting interface with the Settings window open. The Settings window has a sidebar with icons for General, Video, Audio, Share Screen, Chat, Background & Filters, Recording, Profile, Statistics, Keyboard Shortcuts, and Accessibility. The 'Share Screen' option is highlighted with a blue bar and a yellow arrow pointing to it from the left.

Window size when screen sharing:

- Fullscreen mode
- Maximize window
- Maintain current size

When I share my screen in a meeting

- Automatically share desktop
- Show all sharing options

When I share directly to a Zoom Room

- Automatically share desktop
- Show all sharing options

Advanced

Video Settings...

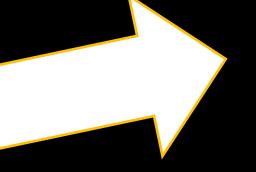
Steffen Brandt

Mute Start Video Security Participants

ORGANIZATIONAL MATTERS

- **Use your full names in the zoom meetings!**
- **Scan the QR-Code if you participate in presence**
- **Complete your profile in the Mattermost chat with your full name and a foto.**
- **Please write us if you will not go on with the course!**

19. 04.	INTRODUCTION TO NEURAL NETS AND TOOLS USED DURING THE COURSE
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
26. 04.	INTRODUCTION TO TENSORFLOW FOR AI, MACHINE LEARNING, AND DEEP LEARNING, PART I
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
03. 05.	INTRODUCTION TO TENSORFLOW FOR AI, MACHINE LEARNING, AND DEEP LEARNING, PART II
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
10. 05.	CONVOLUTIONAL NEURAL NETWORKS, PART I
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
17. 05.	CONVOLUTIONAL NEURAL NETWORKS, PART II
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark

Coding.Waterkant 

24. 05.	NATURAL LANGUAGE PROCESSING, PART I
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
31. 05.	NATURAL LANGUAGE PROCESSING, PART II
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
07. 06.	JOINT CODING
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
14. 06.	SEQUENCES, TIME SERIES AND PREDICTION, PART I
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
21. 06.	SEQUENCES, TIME SERIES AND PREDICTION, PART II
16: 00- 17: 45	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark
28. 06.	PRESENTATION OF THE FINAL PROJECTS
16: 00- 19: 00	Zoom + Starterkitchen, Kuhnkestraße 6, Wissenschaftspark



CODING. WATERKANT 2022

From June 7 to 11, 2022, at the site of the Waterkant Festival

- **Work for four consecutive days on current machine learning projects**
- **Exchange ideas with others working in the field**
- **Take part in workshops**
- **Get input and feedback by invited experts**
- **Present your work to a larger audience.**

PARTICIPATION FORMS

Join a project:

If you want to get further expertise by working on a real-life machine learning project, you can select on Tuesday morning of the event to work on one of the projects that is looking for participants to join them.

Bring your own project:

If you want to work on your own machine learning project during the four days, please, contact us under team@kiel.ai, so we can include your project into the list of participating projects. If you are interested in support for your project you can decide to invite other participants to join your project during the four days.

**„Education is the only thing that humans try to
get less out of than what they pay for.“**

FIRST BREAKOUT

- **15-20 Minutes**
- **Present yourself**
- **Discussion Questions:**
 - **Do you know examples for Machine Learning?**
 - **Do you know examples for Deep Learning?**

Artificial Intelligence

A science devoted to making machines think and act like humans.

Machine Learning

Focuses on enabling computers to perform tasks without explicit programming.

Deep Learning

A subset of machine learning based on artificial neural networks.

Artificial Intelligence

Machine Learning

Deep Learning

//



Browse > Data Science > Machine Learning

Offered By



DeepLearning.AI TensorFlow Developer Professional Certificate

4.7 18,303 ratings



Laurence Moroney

[Enroll](#)

Starts Apr 19

Financial aid available

143,350 already enrolled

**Do NOT try to enroll for
the Certificate Program!**

[About](#) [How It Works](#) [Courses](#) [Instructors](#) [Enrollment Options](#) [FAQ](#)**WHAT YOU WILL LEARN**

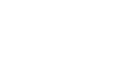
- Best practices for TensorFlow, a popular open-source machine learning framework to train a neural network for a computer vision applications.
- Handle real-world image data and explore strategies to prevent overfitting, including augmentation and dropout.
- Build natural language processing systems using TensorFlow.
- Apply RNNs, GRUs, and LSTMs as you train them using text repositories.

SKILLS YOU WILL GAIN**LEARNER CAREER OUTCOMES**

32% Started a new career after completing this specialization.

**Shareable Certificate**

Earn a Certificate upon completion

**100% online courses**

career. Many Professional Certificates have hiring partners that recognize the Professional Certificate credential and others can help prepare you for a certification exam. You can find more information on individual Professional Certificate pages where it applies.



Click here!



There are 4 Courses in this Professional Certificate

COURSE

1

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

★★★★★ 4.7 16.996 ratings • 3.515 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming Machine Learning in Tensorflow Specialization and will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

[SHOW ALL](#)

COURSE

2

Convolutional Neural Networks in TensorFlow

★★★★★ 4.7 7.307 ratings • 1.135 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming

Browse > Computer Science > Software Development

Offered By

DeepLearning.AI

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

4.7 16,996 ratings • 3,515 reviews



Laurence Moroney

Click here!

**Enroll for Free**

Starts Apr 19

Financial aid available

287,307 already enrolled

[About](#)[Instructors](#)[Syllabus](#)[Reviews](#)[Enrollment Options](#)[FAQ](#)

About this Course

535,549 recent views

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming Machine Learning in Tensorflow Specialization and will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

The Machine Learning course and Deep Learning Specialization from Andrew Ng teach the most important and foundational principles of

[SHOW ALL](#)

WHAT YOU WILL LEARN

Learn best practices for using TensorFlow, a popular

Build a basic neural network in TensorFlow



Flexible deadlines

Reset deadlines in accordance to your schedule.



Shareable Certificate

Earn a Certificate upon completion



100% online

Start instantly and learn at your own schedule.



Course 1 of 4 in the

DeepLearning.AI TensorFlow Developer



Browse > Computer Science > Software Development

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Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

★★★★★ 4.7 16,996 ratings • 3,515 reviews



Laurence Moroney

[Enroll for Free](#)

Starts Apr 19

Financial aid available

287,307 already enrolled

[About](#) [Instructors](#) [Syllabus](#) [Reviews](#) [Enroll](#)

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If you are a software developer who wants to build
This course is part of the upcoming Machine Learning
popular open-source framework for machine learning.

The Machine Learning course and Deep Learning Specialization from Andrew Ng teach the most important and foundational principles of

[SHOW ALL](#)

WHAT YOU WILL LEARN

✓ Learn best practices for using TensorFlow, a popular

✓ Build a basic neural network in TensorFlow

Enroll here!

This course is part of a 4-course Professional Certificate

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning is part of the DeepLearning.AI TensorFlow Developer certificate.

This Professional Certificate includes:

- ✓ Unlimited access to all 4 courses
- ✓ Shareable certificate of completion from DeepLearning.AI
- ✓ 14 day refund period

How much time do you need to finish?

We've estimated how many hours you'll need to learn each week to finish all 4 courses. One-time payment plans below do not automatically renew.

 1 month

20 HOURS/WEEK

€44

[Continue](#)[Audit the course](#)

Flexible deadlines

set deadlines in accordance to your schedule.

Shareable Certificate

Earn a Certificate upon completion

100% online

Start instantly and learn at your own schedule.

Course 1 of 4 in the

DeepLearning.AI TensorFlow Developer

COURSERA REGISTRATION

A screenshot of the Coursera website interface. On the left, a vertical sidebar titled "Switch to" lists several options: "My Coursera" (with a blue "C" icon), "opencampus.sh unlimited" (with a play button icon), "opencampus.sh explore" (with a play button icon), and "Coursera Admin Training" (with a small "coursera" logo). A yellow arrow points from the text "opencampus.sh unlimited" towards the main content area. The main content area features a large teal banner with the text "Welcome to opencampus.sh unlimited Start Hacking Your Life". Below the banner, a message says "Hello Steffen Brandt! Browse content from the **opencampus.sh unlimited** learning program. Your organization has sponsored this program. Discover the [content types](#) we offer." At the top of the page, there is a search bar with the placeholder "What do you want to learn?", a magnifying glass icon, and a user profile for "Steffen Brandt". The top navigation bar includes links for Business, Computer Science, Data Science, Information Technology, Health, and Math and Logic.



What do you want to learn?



Steffen Brandt ▾

תנו כרטיס בירוחם

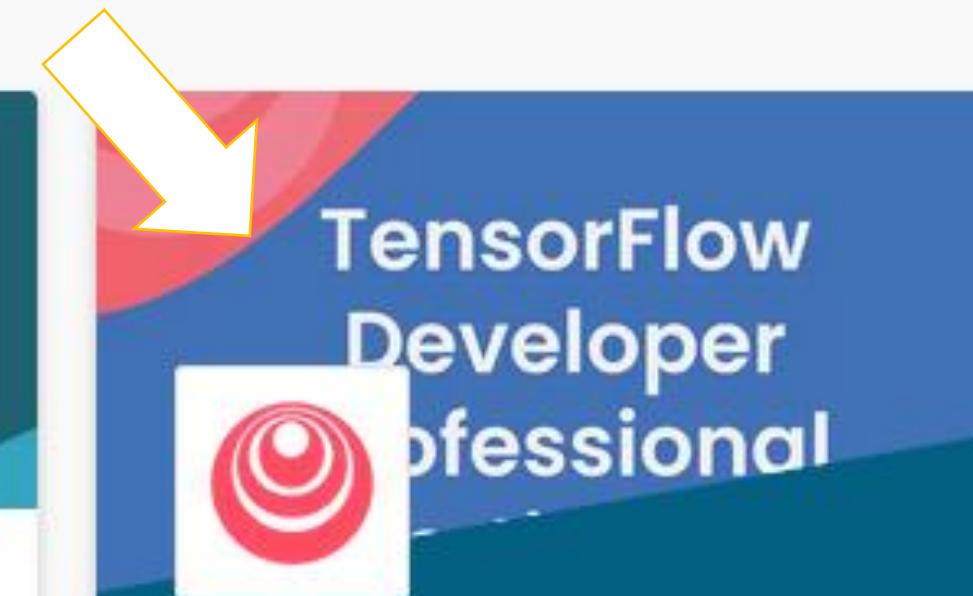
Browse content from the **opencampus.sh unlimited** learning program

Your organization has sponsored this program. Discover the [content types](#) we offer.

Recommendations from your organization

Choose from hand-picked content from this program to advance your career!

Machine Learning



cou

PROFESSIONAL CERTIFICATE

DeepLearning.AI TensorFlow Developer

Offered by



Enrolled

Go to Course

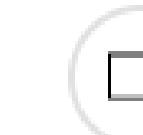
Save for Later

Sponsored by OPENCAMPUS

About this Professional Certificate

TensorFlow is one of the most in-demand and popular open-source deep learning frameworks available today. The DeepLearning.AI TensorFlow Developer Professional Certificate program teaches you applied machine learning skills with TensorFlow so you can build and train powerful models.

In this hands-on, four-course Professional Certificate program, you'll learn the necessary tools to build scalable AI-powered applications with TensorFlow. After finishing this program, you'll be able to apply your new TensorFlow skills to a wide range of problems and projects. This program can help you prepare for the [Google TensorFlow Certificate exam](#) and bring you one step closer to achieving the Google TensorFlow Certificate.



Shareable Certificate

Earn a Certificate upon completion



100% online courses

Start instantly and learn at your own schedule.



Flexible Schedule

Set and maintain flexible deadlines.

[About](#) [How It Works](#) [Courses](#) [Instructors](#) [Enrollment Options](#) [FAQ](#)

COURSE

[Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning](#)

1

4.7 12.904 ratings • 2.739 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming Machine Learning in Tensorflow Specialization and will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

[SHOW ALL](#)

COURSE

[Convolutional Neural Networks in TensorFlow](#)

2

4.7 5.658 ratings • 858 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming Machine Learning in Tensorflow Specialization and will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

[SHOW ALL](#)

COURSE

[Natural Language Processing in TensorFlow](#)

3

4.6 4.631 ratings • 711 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This Specialization will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

[SHOW ALL](#)

COURSE

[Sequences, Time Series and Prediction](#)

4

4.6 3.279 ratings • 526 reviews

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This Specialization will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

[Back to DeepLearning.AI TensorFlow Developer](#)

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

★★★★★ 4.7 14,803 ratings • 3,104 reviews

Enroll

[Go to Course](#)

Sponsored by OPENCAMPUS

About this Course

If you are a software developer who wants to build scalable AI-powered algorithms, you need to understand how to use the tools to build them. This course is part of the upcoming Machine Learning in Tensorflow Specialization and will teach you best practices for using TensorFlow, a popular open-source framework for machine learning.

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Shareable Certificate

Earn a Certificate upon completion



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Flexible deadlines

Reset deadlines in accordance to your schedule.



Intermediate Level



Browse > Data Science > Machine Learning

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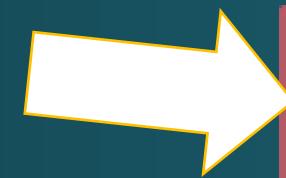


DeepLearning.AI TensorFlow Developer Professional Certificate

★★★★★ 4.7 15,626 ratings



Laurence Moroney



Enrolled

Already enrolled

115,497 already enrolled

[About](#) [How It Works](#) [Courses](#) [Instructors](#) [Enrollment Options](#) [FAQ](#)

WHAT YOU WILL LEARN

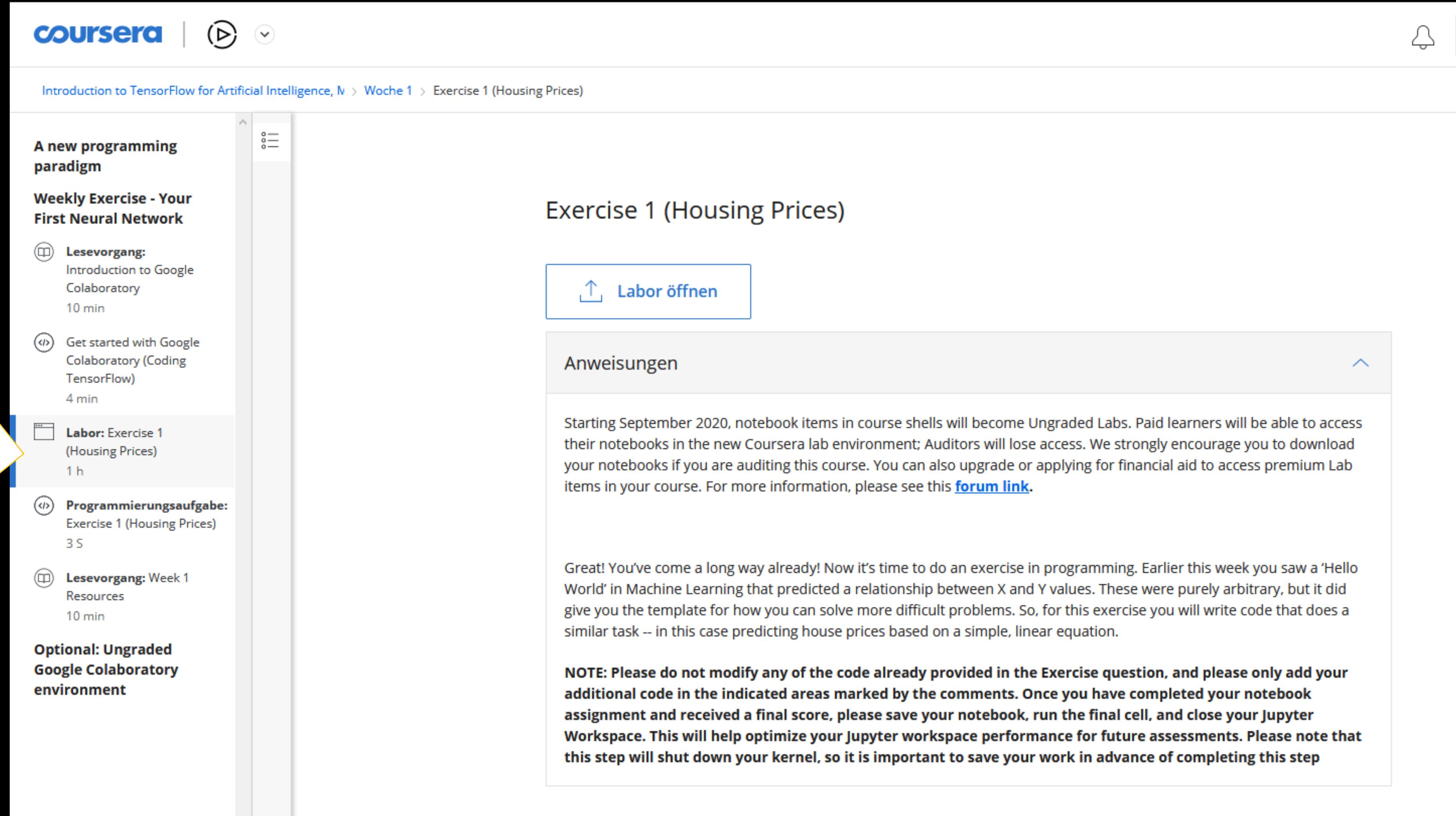
Best practices for TensorFlow, a popular

Handle real world image data and explore



LEARNER CAREER OUTCOMES

EXERCISES (LABS)



The screenshot shows the Coursera interface for the "Introduction to TensorFlow for Artificial Intelligence" course, specifically Week 1, Exercise 1 (Housing Prices). The sidebar on the left lists various course components:

- A new programming paradigm
- Weekly Exercise - Your First Neural Network
- Lesevorgang:** Introduction to Google Colaboratory (10 min)
- Get started with Google Colaboratory (Coding TensorFlow)** (4 min)
- Labor:** Exercise 1 (Housing Prices) (1 h) Labor öffnen
- Programmierungsaufgabe:** Exercise 1 (Housing Prices) (3 S)
- Lesevorgang:** Week 1 Resources (10 min)
- Optional: Ungraded Google Colaboratory environment

The main content area displays the exercise details:

Exercise 1 (Housing Prices)

Anweisungen

Starting September 2020, notebook items in course shells will become Ungraded Labs. Paid learners will be able to access their notebooks in the new Coursera lab environment; Auditors will lose access. We strongly encourage you to download your notebooks if you are auditing this course. You can also upgrade or apply for financial aid to access premium Lab items in your course. For more information, please see this [forum link](#).

Great! You've come a long way already! Now it's time to do an exercise in programming. Earlier this week you saw a 'Hello World' in Machine Learning that predicted a relationship between X and Y values. These were purely arbitrary, but it did give you the template for how you can solve more difficult problems. So, for this exercise you will write code that does a similar task -- in this case predicting house prices based on a simple, linear equation.

NOTE: Please do not modify any of the code already provided in the Exercise question, and please only add your additional code in the indicated areas marked by the comments. Once you have completed your notebook assignment and received a final score, please save your notebook, run the final cell, and close your Jupyter Workspace. This will help optimize your Jupyter workspace performance for future assessments. Please note that this step will shut down your kernel, so it is important to save your work in advance of completing this step

EXERCISES

- **Each week two to four of you will present the exercises**
- **Each of you presents at least once**

PROJECTS

Option 1:

Bring your own idea and data

Option 2:

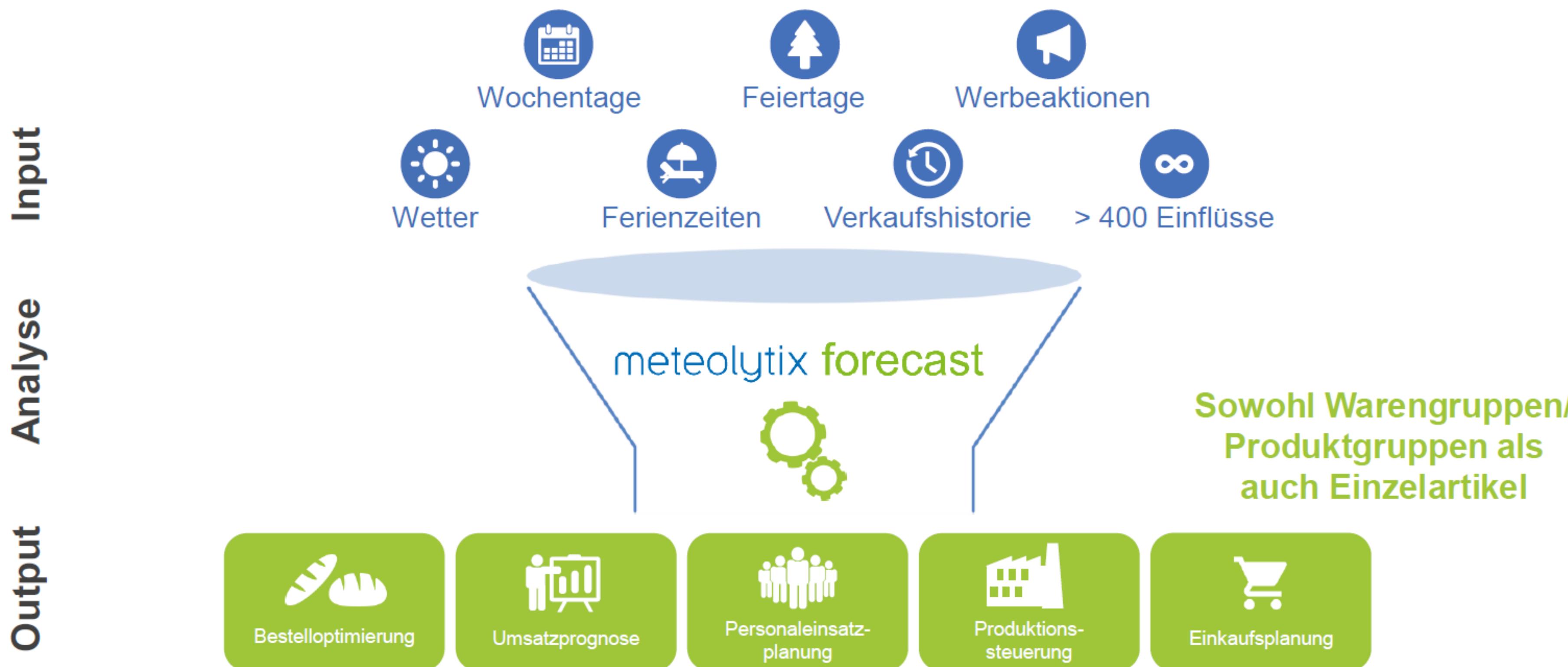
Do one of the two default projects

DEFAULT PROJECT 1

- **Time series prediction**
- **Based on sales data from a local bakery chain**
- **Prediction of future sales for three different stores and different product groups**

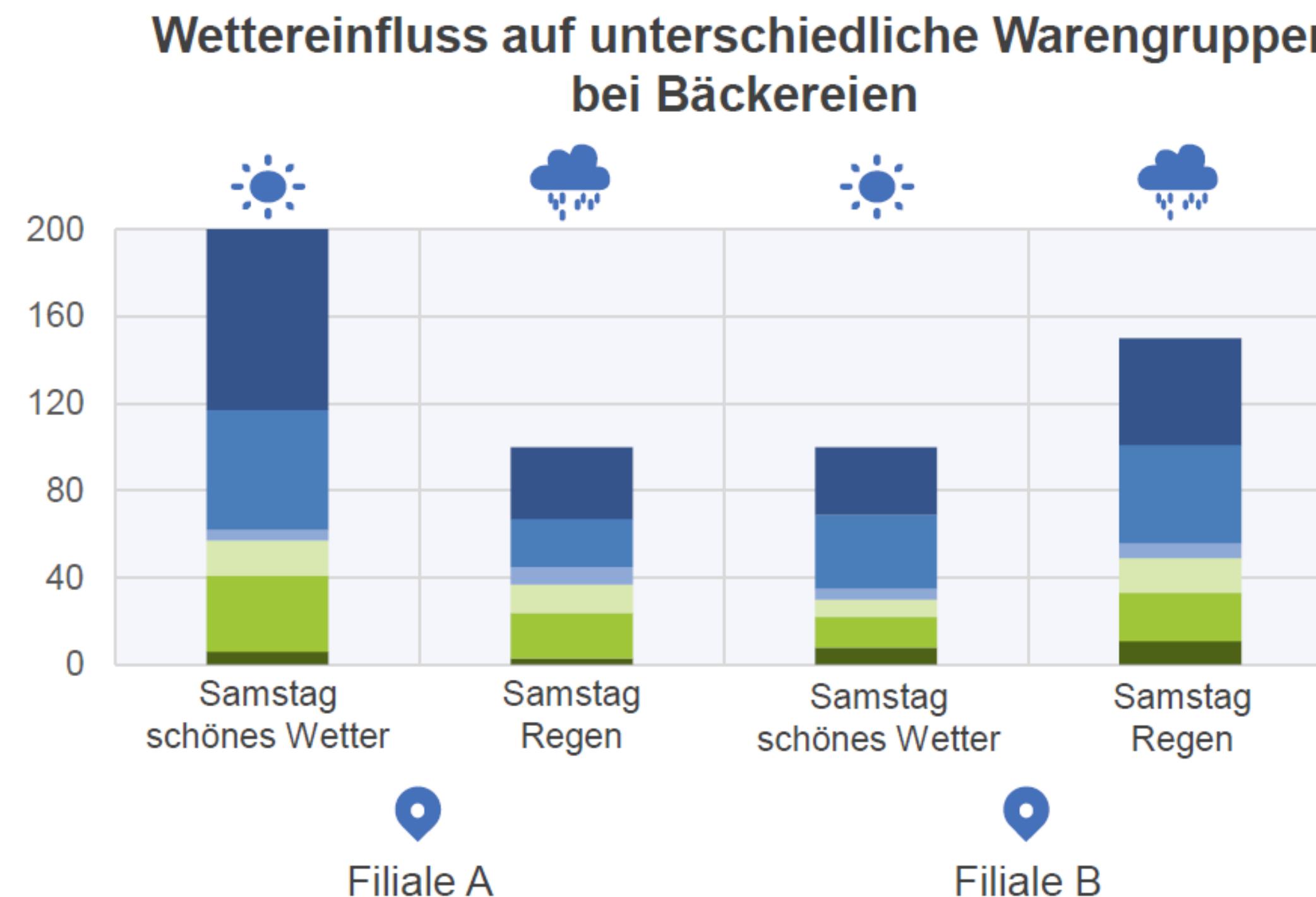
meteolytix forecast analysiert die Datenzusammenhänge von mehr als 400 Einflussfaktoren und liefert Absatzprognosen für viele Einsatzfelder.

WAS WIR MACHEN



Die Stärke des Wettereffekts variiert von Ort zu Ort und wird jeweils filialindividuell berücksichtigt.

WAS WIR MACHEN



INTRODUCTION ROUND WITH PROJECT INTERESTS



RStudio

Machine Learning With TensorFlow >

Deep Learning >

Natural Language Processing >

Advanced Machine Learning

EVENTS

Waterkant Coding Hackathon

Prototyping Week

PROJECTS

Requirements

Possible Projects

Past Projects

ADDITIONAL RESOURCES

Glossary

Tools >

Optimizer

Linear Algebra

Python



Possible Projects

You are very welcome to bring your own data and project idea to a course. Simply talk to your course lead about your idea and the goal of the project until the end of the semester.

Further, we are offering a list of possible projects with corresponding datasets, you can use as project (see table below). Please, also talk to your course lead if you want to work on one of these challenges as your course project.

A further option is that you talk to local companies or chairs at your local higher education institutions if they are interested in a machine learning prototype for some of their production or research tasks and would like to share the corresponding data. If you find a partner that would be interested in such a project, we will be happy to support you in the definition of the project together with the partner and also, for example, with setting up a non-disclosure agreement for the provided data.

A final option is that you look for an interesting dataset on the Internet and define yourself a project based on this dataset. However, we would very much recommend you to choose one of the before mentioned options. With datasets from the Internet (e.g. from Kaggle competitions) your main challenge is typically limited to optimizing the model with an already prepared dataset. However, in practice the challenge is more often to construct the right training and validation datasets and construct the right features.

Title	Description	Dataset
	On a good surfing day for a particular surf spot, the number of pageviews on the site with the forecasts for that spot usually increases. The number of pageviews shall be used as a proxy for the quality of the surfing day in order to improve the forecast of a	Weather station data of 7 popular surf spots (Kiel Lighthouse, Skt. Peter-Ording, Wernigerode, Dartmoor Airport)



RStudio

Machine Learning With
TensorFlow >

Deep Learning >

Natural Language Processing >

Advanced Machine Learning

EVENTS

Waterkant Coding Hackathon

Prototyping Week

PROJECTS

Requirements

Possible Projects

Past Projects

ADDITIONAL RESOURCES

Glossary

Tools >

Optimizer

Linear Algebra

Requirements

In order to receive ECTS for a course you have to complete a machine learning project by yourself or preferably in a team with a maximum of 4 participants.

Typically the project work starts **in the middle of the course**.

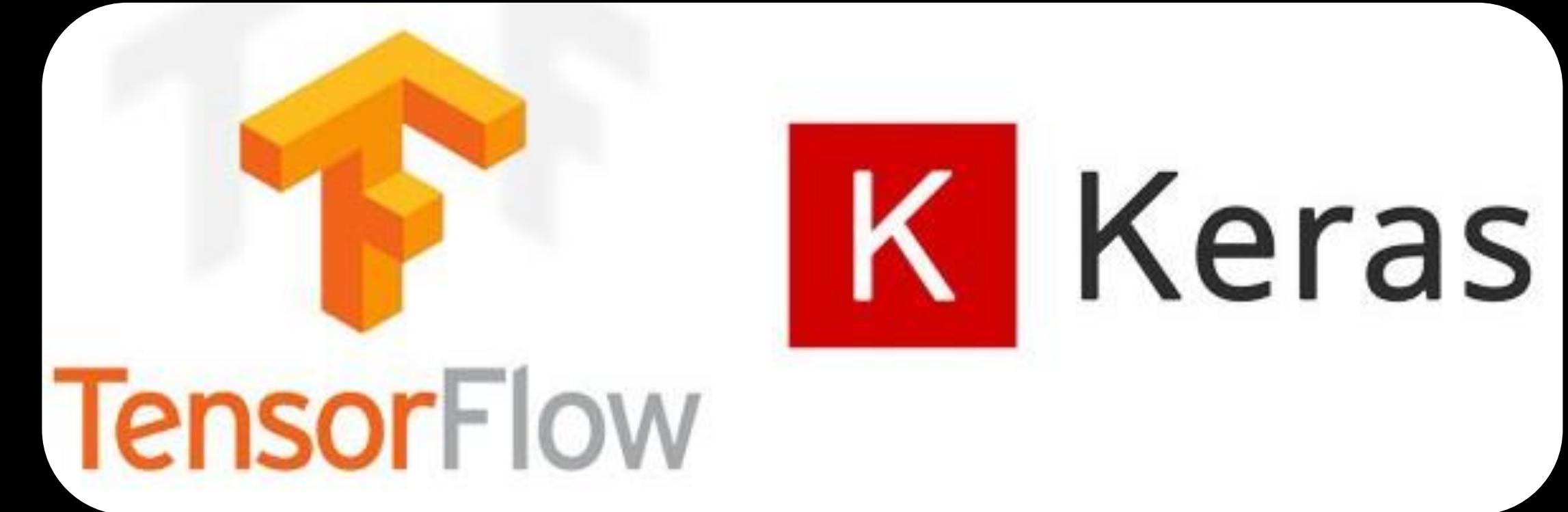
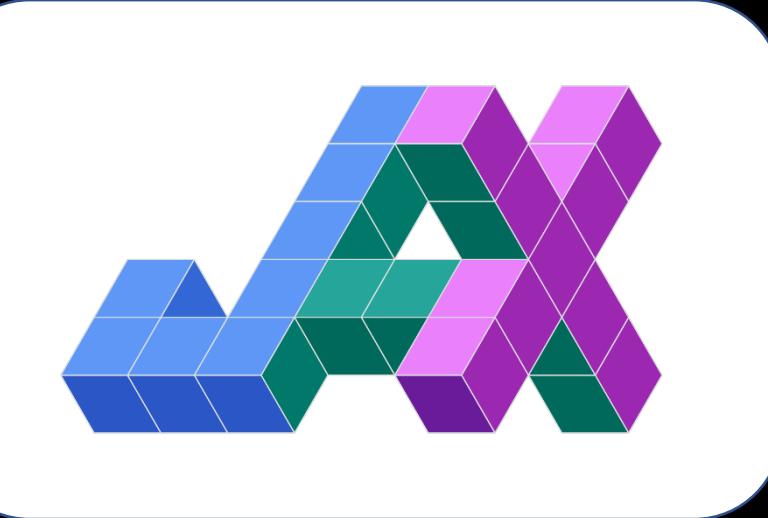
The requirement for this semester are:

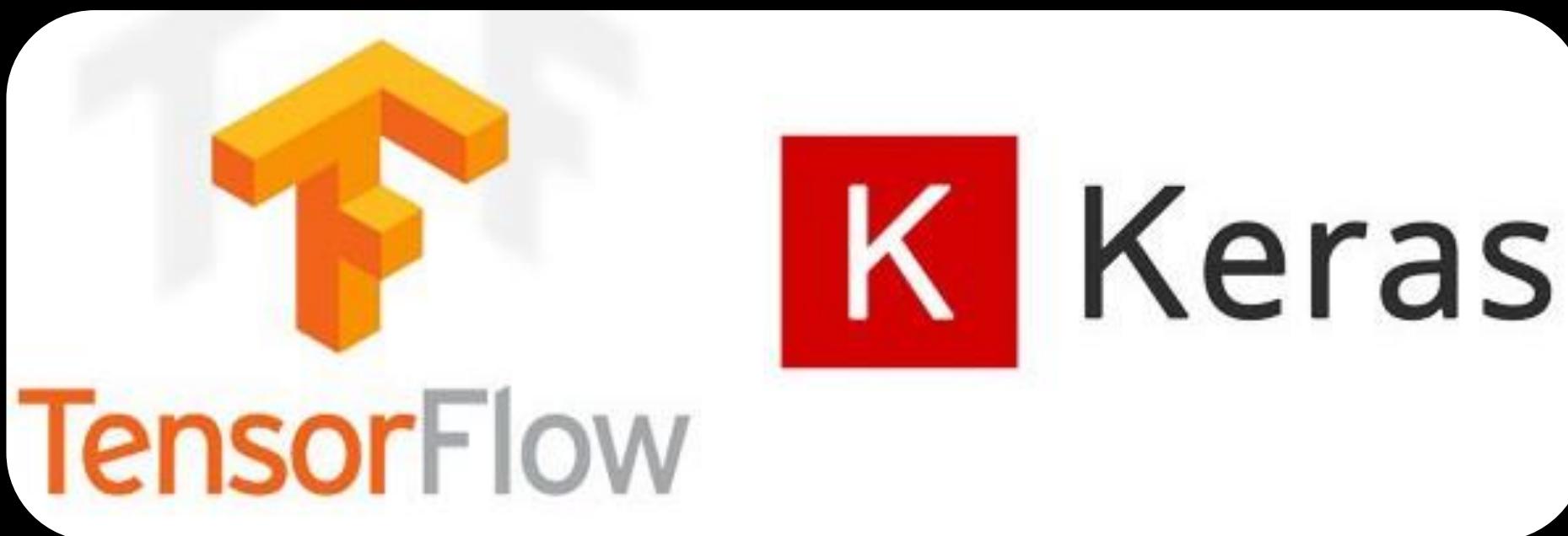
1. Presentation of a detailed Jupyter Notebook with code and comment
 - **including the definition of the environment**
 - **including required sections (Introduction, Data and Methods, Results, Baseline)**
2. A small video, accompanying, for example, a screen recording of the notebook with an explanation of the challenge of the project, the used approach, and the results.
3. A statement that the code is released as open source software.
The data you use in your project can remain private if you wish.

Details about the requirements of the project will additionally be discussed **in the course**.

Please ask about whatever may be unclear, preferably **before you start the project**.

P Y T🔥 R C H





- **Feb 2017:** **TensorFlow 1.0 (Estimator API)**
- **Nov 2017:** **TensorFlow 1.4 (Estimator API, Keras API)**
- **Jan 2019:** **TensorFlow 2.0 (Estimator API, Keras API)**

TASKS UNTIL NEXT WEEK

- Completion of the learning material of week 1 and 2 of the course "introduction to TensorFlow"**
- Complete Exercises 1 and 2 of the above course**
- Bring questions!**