

DATA SCIENCE 1

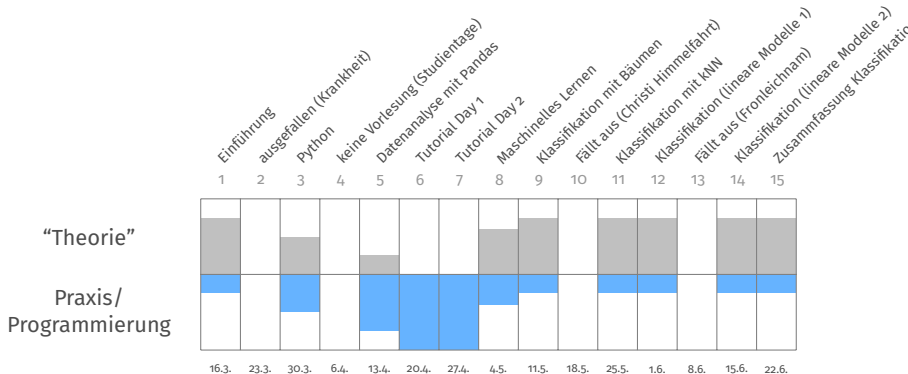
VORLESUNG 2 - WIEDERHOLUNG

PROF. DR. CHRISTIAN BOCKERMANN

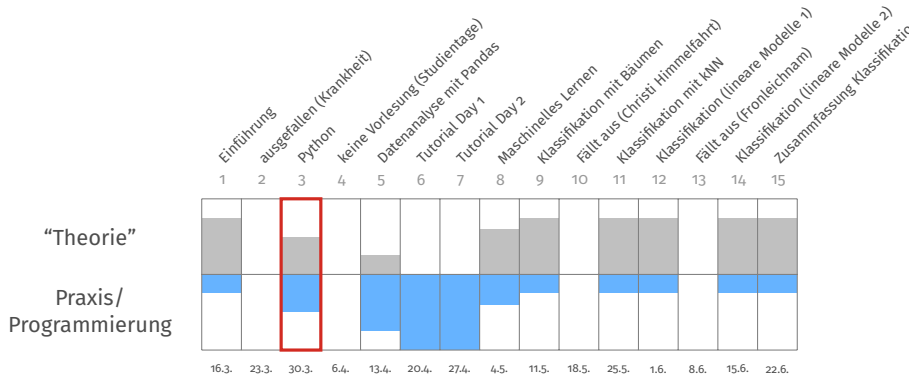
HOCHSCHULE BOCHUM

SOMMERSEMESTER 2023

Aufbau der Vorlesung



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Wiederholung: Anwendungen für Data Science (*Use Cases*)

- Formel 1 - Überwachung, Vorhersage (Regression, Strategie)
- IP-TV - Marketing: Zielgruppenanalyse, Gruppen finden
- Handel - Kundenprofile, Gemeinsamkeiten erkennen

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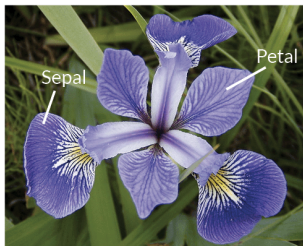
Beispiel: Klassifikation (Lernaufgabe)

- Spam-Erkennung (Text-Daten, Vorhersage: *Spam* / *No-Spam*)
- Weitere Use-Cases (aus Übungsblatt 1?)

Ausflug in die Botanik:



Ausflug in die Botanik: Schwertlilien



Iris Versicolor

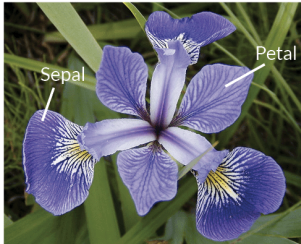


Iris Setosa



Iris Virginica

Ausflug in die Botanik: Schwertlilien



Iris Versicolor

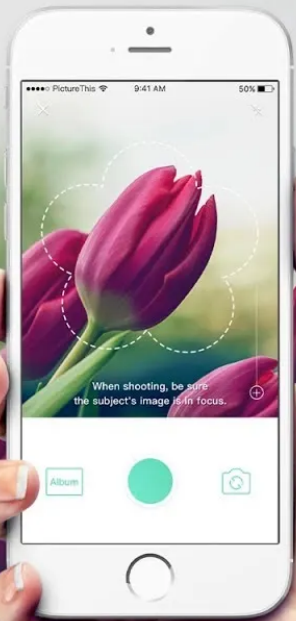


Iris Setosa



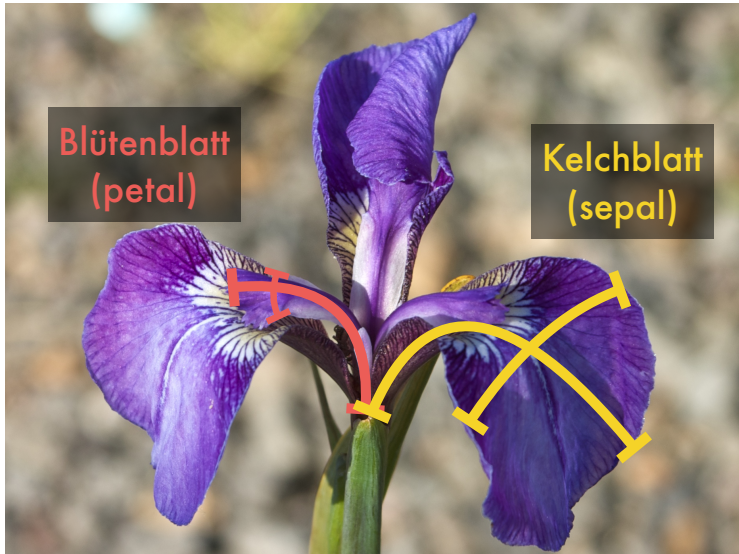
Iris Virginica

Wie soll man die auseinanderhalten?



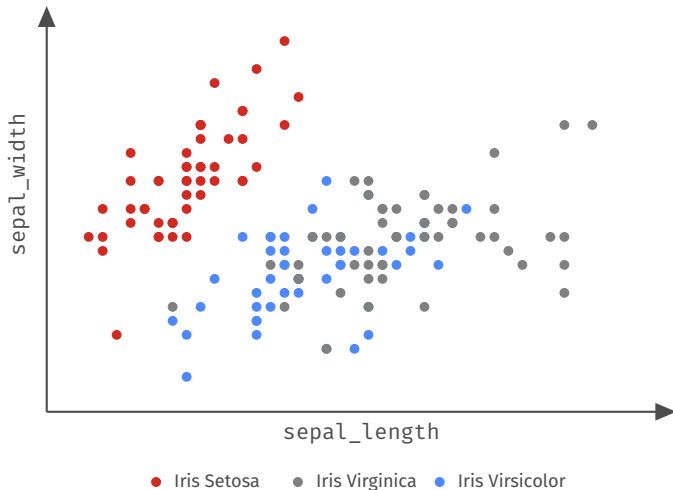
PictureThis Plant Identification

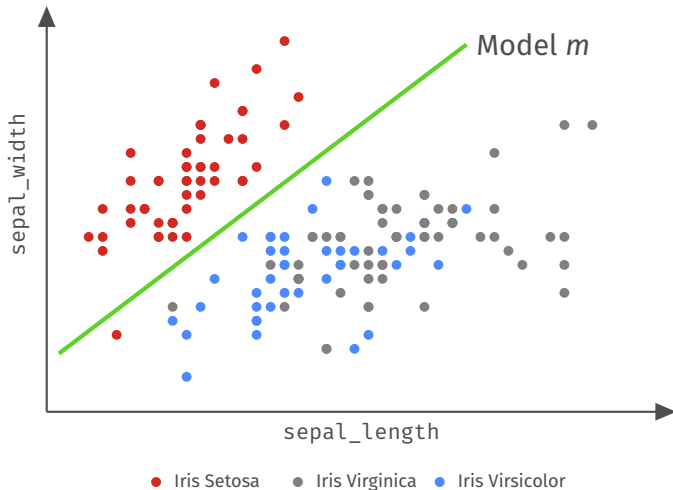




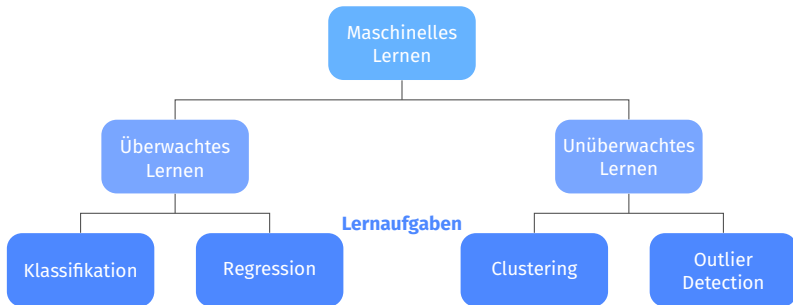
sepal_length	sepal_width	petal_length	petal_width	species
6.3	2.3	4.4	1.3	versicolor
6.4	2.7	5.3	1.9	virginica
5.4	3.7	1.5	0.2	setosa
6.1	3.0	4.6	1.4	versicolor
5.0	3.3	1.4	0.2	setosa
5.0	2.0	3.5	1.0	versicolor

Iris Datensatz, [Fisher, 1988]

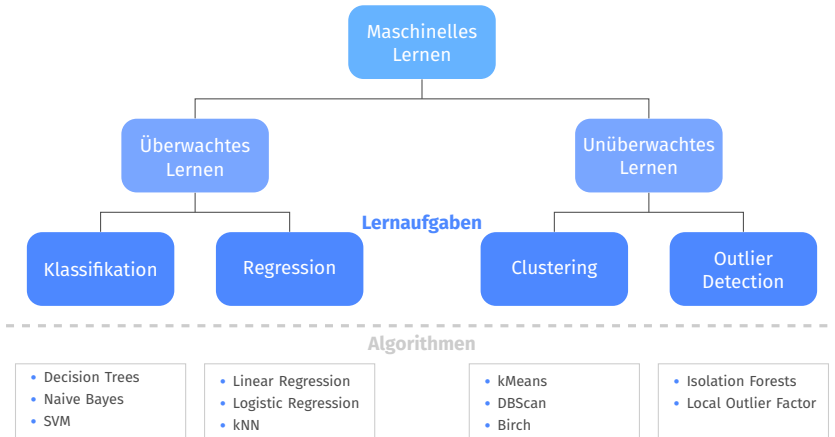




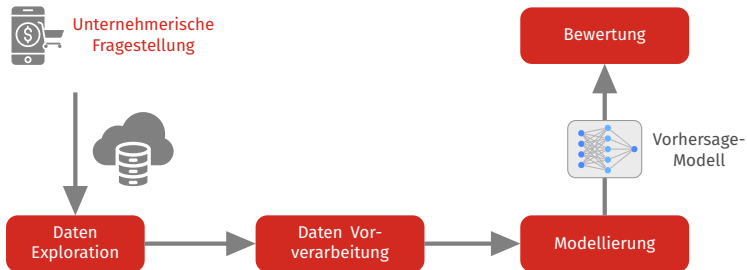
Lernaufgaben im Maschinellen Lernen



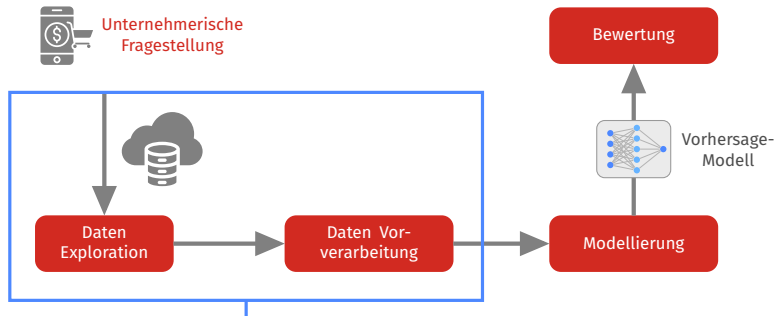
Lernaufgaben im Maschinellen Lernen



Wiederholung: Vorgehen bei der Datenanalyse (CRISP-DM)




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Datenvorverarbeitung
hier: Mit Python und Pandas

Data Science Anwendungsfälle (Aufgabe 3, Blatt 1)

- Welche Datenquellen/-arten gibt es?
- Welchen Nutzen hat ML/KI im gegebenen Anwendungsfall?
- Welche Lernaufgaben stecken dahinter?

Hochschule Bochum
Bochum University
of Applied Sciences 

Fachbereich Wirtschaft
Prof. Dr. Christian Bockermann

Data Science
Sommersemester 2023
Übungsblatt 1

Aufgabe 1 (Fragebogen)
Unter der URL
<https://hsbo.de/ds1umfrage>

finden Sie einen Fragebogen zu dieser Vorlesung. Es geht darum, ein paar Vorkenntnisse

Business Model Canvas










The Business Model Canvas

Designed for: _____

Designed by: _____

Date: _____











Description: _____

<p>Key Partners</p>  <p>Who are the partners? What are they expected to do? What are the expected gains resulting from partners? What are the risks? What are the expected costs? What are the expected benefits?</p>	<p>Key Activities</p>  <p>What key activities do our Key Partnerships require? Do they have a common goal? What are the expected gains? What are the expected costs? What are the expected benefits?</p>	<p>Value Propositions</p>  <p>What value proposition do we offer customers? What value proposition do we offer our partners? What value proposition do we offer our suppliers? What value proposition do we offer our employees? What value proposition do we offer our investors? What value proposition do we offer our competitors?</p>	<p>Customer Relationships</p>  <p>What type of relationship do we offer our customers? What type of relationship do we offer our partners? What type of relationship do we offer our suppliers? What type of relationship do we offer our employees? What type of relationship do we offer our investors? What type of relationship do we offer our competitors?</p>	<p>Customer Segments</p>  <p>Who are our segments? What are the expected gains? What are the expected costs? What are the expected benefits?</p>
<p>Key Resources</p>  <p>What key resources do our Key Partnerships require? Do they have a common goal? What are the expected gains? What are the expected costs? What are the expected benefits?</p>			<p>Channels</p>  <p>Through which channels do we offer our customers? What are the expected gains? What are the expected costs? What are the expected benefits?</p>	
<p>Cost Structure</p>  <p>What are the expected costs? What are the expected benefits? What are the expected gains? What are the expected costs? What are the expected benefits?</p>		<p>Revenue Streams</p>  <p>What are the expected gains? What are the expected costs? What are the expected benefits? What are the expected gains? What are the expected costs? What are the expected benefits?</p>		

www.businessmodelgeneration.com

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The Machine Learning Canvas (v0.4) Designed for: Designed by: Date: Iteration:

<p>Decisions </p> <p>How are predictions used to make decisions that provide the proposed value to the end-user?</p>	<p>ML task </p> <p>Input, output to predict, type of problem.</p>	<p>Value Propositions </p> <p>What are we trying to do for the end-user(s) of the predictive system? What objectives are we serving?</p>	<p>Data Sources </p> <p>Which raw data sources can we use (internal and external)?</p>	<p>Collecting Data </p> <p>How do we get new data to learn from (inputs and outputs)?</p>
<p>Making Predictions </p> <p>When do we make predictions on new inputs? How long do we have to featurize a new input and make a prediction?</p>	<p>Offline Evaluation </p> <p>Methods and metrics to evaluate the system before deployment.</p>	<p>Features </p> <p>Input representations extracted from raw data sources.</p>		<p>Building Models </p> <p>When do we create/update models with new training data? How long do we have to featurize training inputs and create a model?</p>
<p>Live Evaluation and Monitoring </p> <p>Methods and metrics to evaluate the system after deployment, and to quantify value creation.</p>				

Vorlesung 2 (heute):

- Python “Crashkurs” – Grundlagen/Überblick
- Jupyter-Notebooks für Übungen

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Vertiefung von Python wird die Vorlesung begleiten.

```
Function berechneKosten(besucherAnzahl As Double,  
                        groesse As String) As  
                        Double  
    Const pauschale As Double = 2500.0  
    Const ticketPreis As Double = 25.0  
    Const aufschlagStadion As Double = 0.10  
  
    Dim kosten As Double  
    kosten = 0  
  
    kosten = pauschale + besucherAnzahl * ticketPreis  
  
    If groesse = 'Stadion' Then  
        kosten = kosten + kosten * aufschlagStadion  
    End If  
  
    berechneKosten = kosten  
End Function
```

```
def berechneKosten(besucherAnzahl, groesse):  
    pauschale = 2500.0  
    ticketPreis = 25.0  
    aufschlagStadion = 0.10  
  
    kosten = pauschale + besucherAnzahl * ticketPreis  
  
    if groesse == 'Stadion':  
        kosten = kosten + kosten * aufschlagStadion  
  
    return kosten
```


Vorlesung 3 (nächste Woche):

- Vorstellung des Pandas Moduls (Python)
- Lesen, Verarbeiten und Visualisieren von Daten