

LU02.L02 - ML Programmierung

Voraussetzung

```
pip install pandas scikit-learn joblib
```

Python-Skript: ml_basics_shop.py

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import StandardScaler
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, confusion_matrix,
classification_report
import joblib

# -----
# Daten laden
# -----
data = pd.read_csv("shop_data.csv")
X = data.drop("buy", axis=1)
y = data["buy"]

# -----
# Train / Test Split
# -----
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)

# -----
# Modell 1: Logistische Regression
# -----
log_reg_pipeline = Pipeline([
    ("scaler", StandardScaler()),
    ("model", LogisticRegression())
])

log_reg_pipeline.fit(X_train, y_train)
y_pred_lr = log_reg_pipeline.predict(X_test)
#
print("Logistische Regression")
print("Accuracy:", accuracy_score(y_test, y_pred_lr))
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred_lr))
print("Classification Report:\n", classification_report(y_test, y_pred_lr))
```

```
# -----  
# Modell 2: Decision Tree  
# -----  
tree_model = DecisionTreeClassifier(random_state=42)  
tree_model.fit(X_train, y_train)  
y_pred_tree = tree_model.predict(X_test)  
  
print("\nDecision Tree")  
print("Accuracy:", accuracy_score(y_test, y_pred_tree))  
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred_tree))  
print("Classification Report:\n", classification_report(y_test,  
y_pred_tree))  
  
# -----  
# Bestes Modell speichern  
# -----  
joblib.dump(log_reg_pipeline, "best_model.joblib")  
  
# -----  
# Neue Vorhersage  
# -----  
new_customer = pd.DataFrame([{\n    "age": 32,\n    "past_purchases": 5,\n    "minutes_on_page": 6.5\n}])  
  
loaded_model = joblib.load("best_model.joblib")  
prediction = loaded_model.predict(new_customer)  
  
print("\nVorhersage fuer neuen Kunden:", prediction[0])
```

Modellvergleich

| Kriterium | Logistische Regression | Decision Tree |
|---------------------|------------------------|---------------|
| Interpretierbarkeit | hoch | mittel |
| Overfitting-Gefahr | gering | hoch |
| Skalierung | nötig ja | nein |
| Didaktisch | sinnvoll sehr | ja |



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