Prediction and optimization of water flow depending on whether forecast

Hackathon September 2023

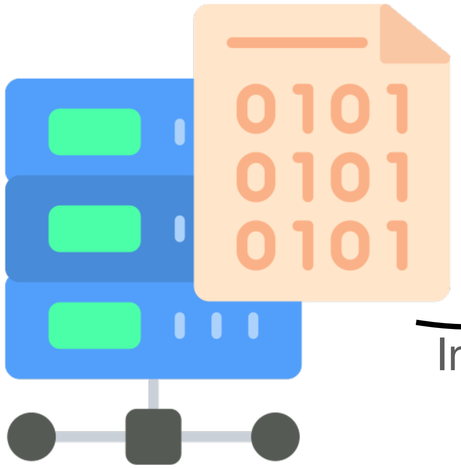
Olivia Riccomi, Antonio Pelusi

Our prototype: training the model

Weather data

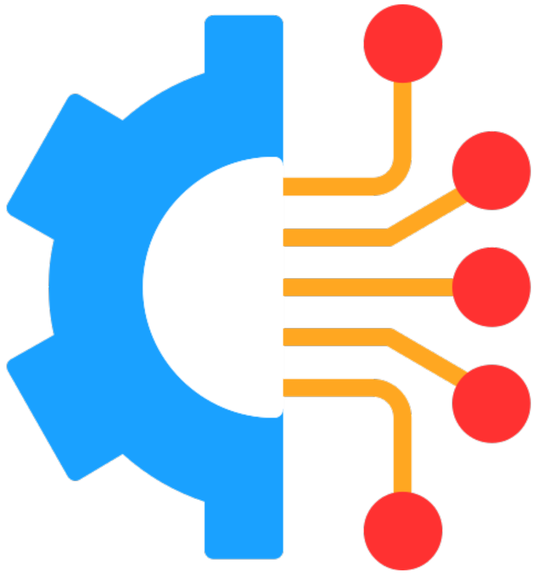
Input

User data



Input

Machine Learning model



Real water consumption data

25 %

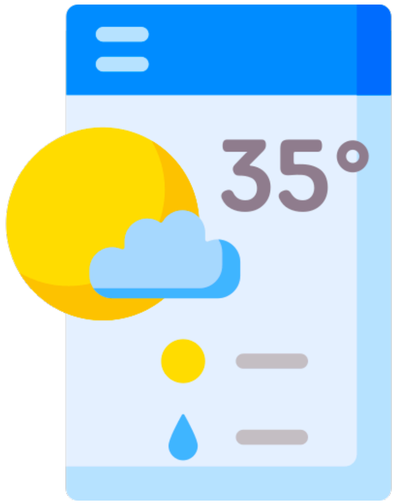
50 %

75 %

100 %

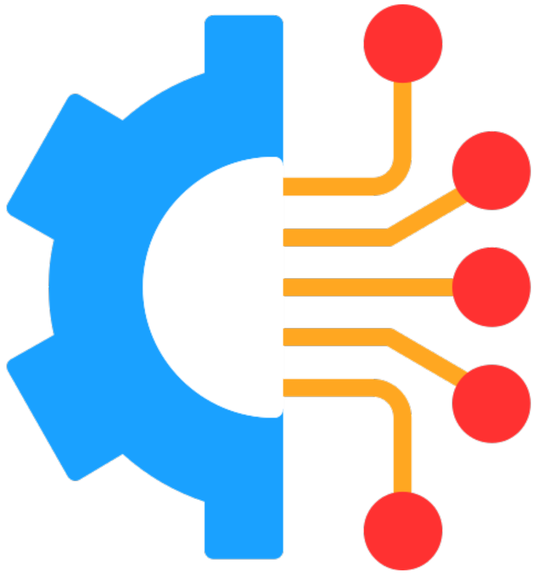
Our prototype: prediction

Weather forecast in 7 days



Input

Machine Learning model



Prediction

Water needed

25 %

50 %

75 %

100 %

The details of the pipeline

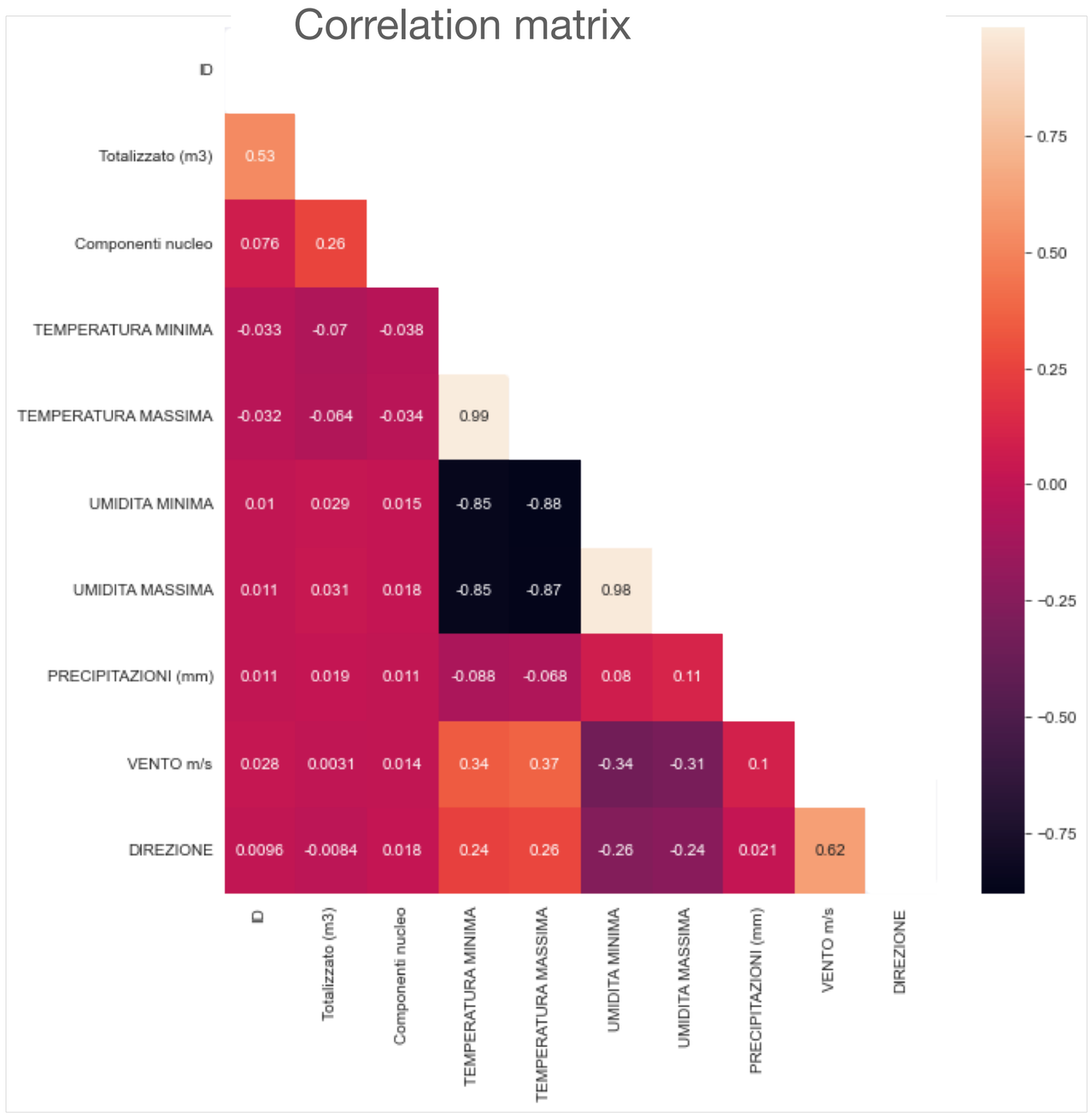
1 Data collection

2 Data analysis

3 Data processing

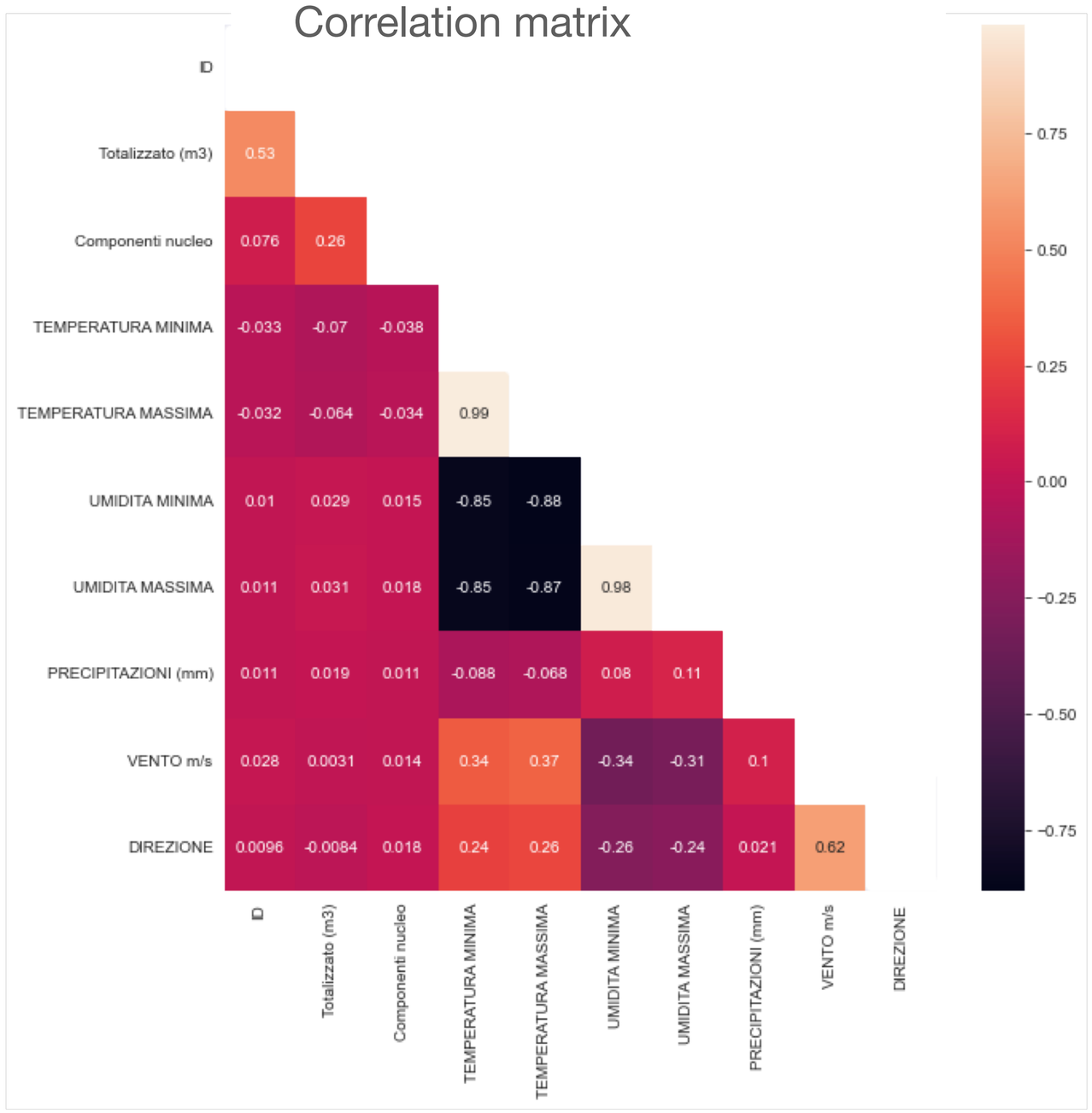
4 Training

5 Prediction



What does the data say?

We have some correlations among our data!



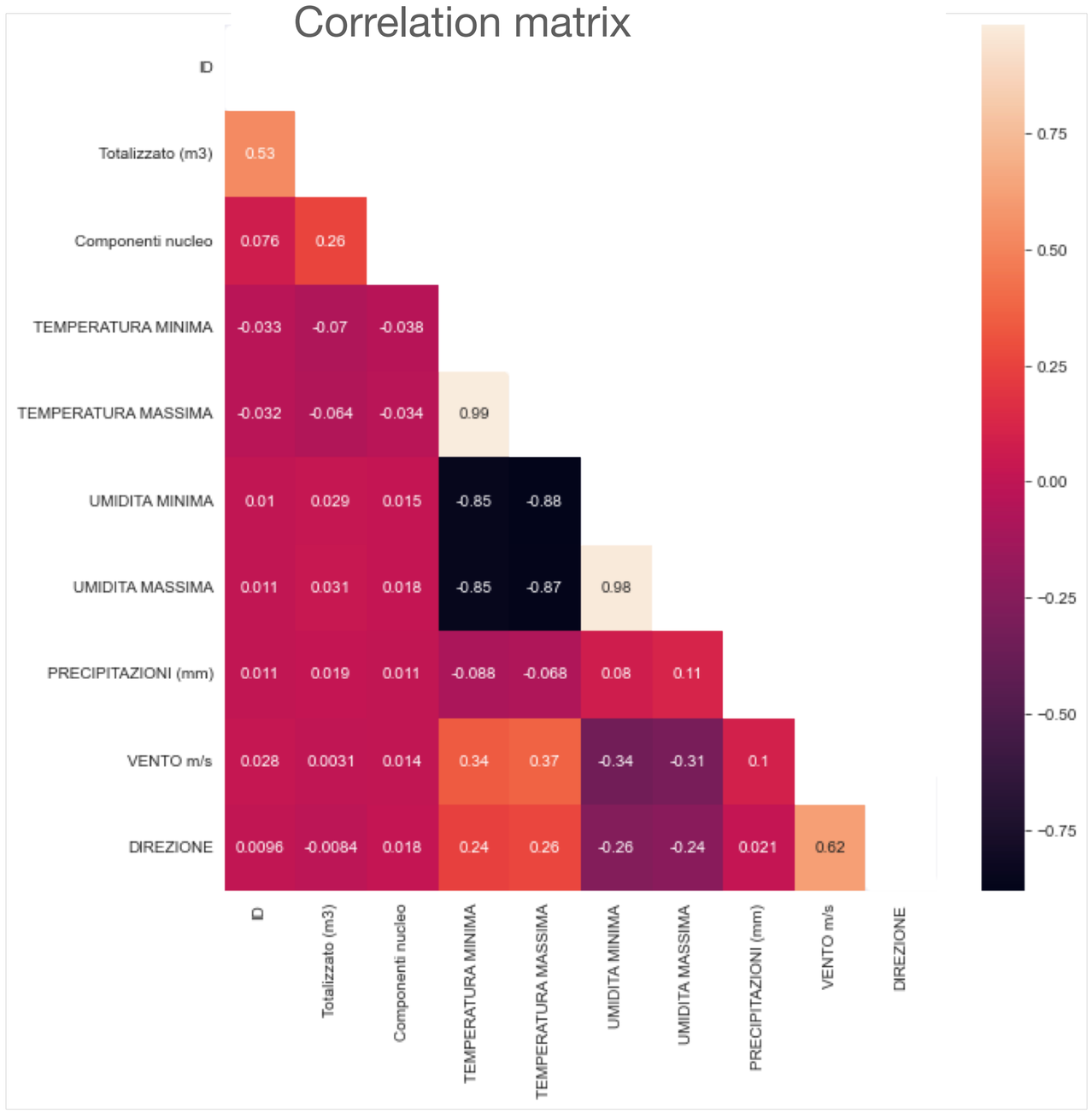
What does the data say?

We have some correlations among our data!

Temperature

I

Water Consumption



What does the data say?

We have some correlations among our data!

Temperature

I

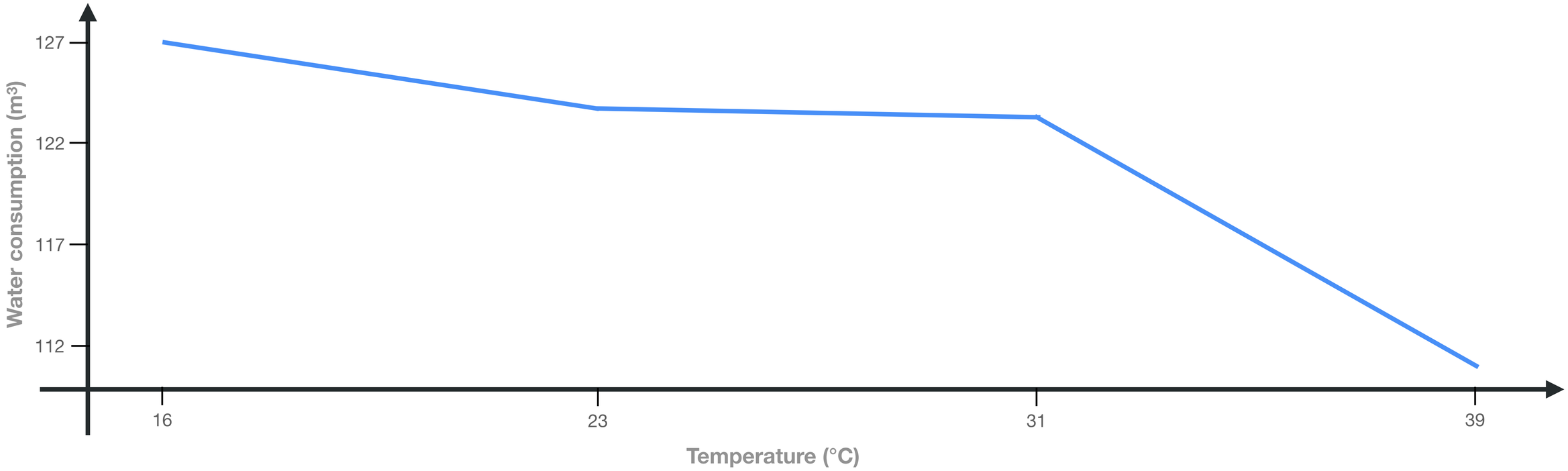
Water Consumption

Temperature

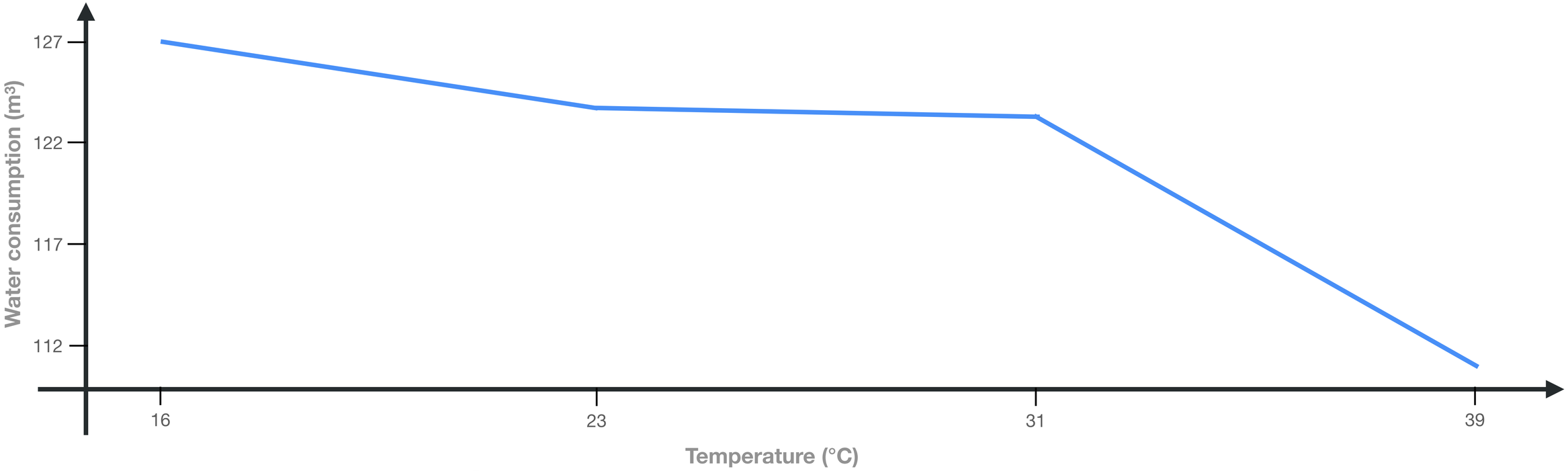
I

Humidity

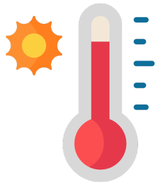
How does temperature affect water consumption?



How does temperature affect water consumption?



temperature increases



water consumption decreases

Prototype

```
join = pd.read_csv(“user_data.csv”)
```

```
plt.figure(figsize=(10,10))
corr = join.corr(method = 'spearman')
sns.heatmap(corr, annot = True, mask=matrix)
```

```
scaler = MinMaxScaler()
X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled = scaler.transform(X_test)
```

```
model = SGDClassifier()
model.fit(X_train_scaled, y_train)
prediction = model.predict(X_test_scaled)
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Prototype

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```
out  Accuracy: 84%
```

The reward system: interface

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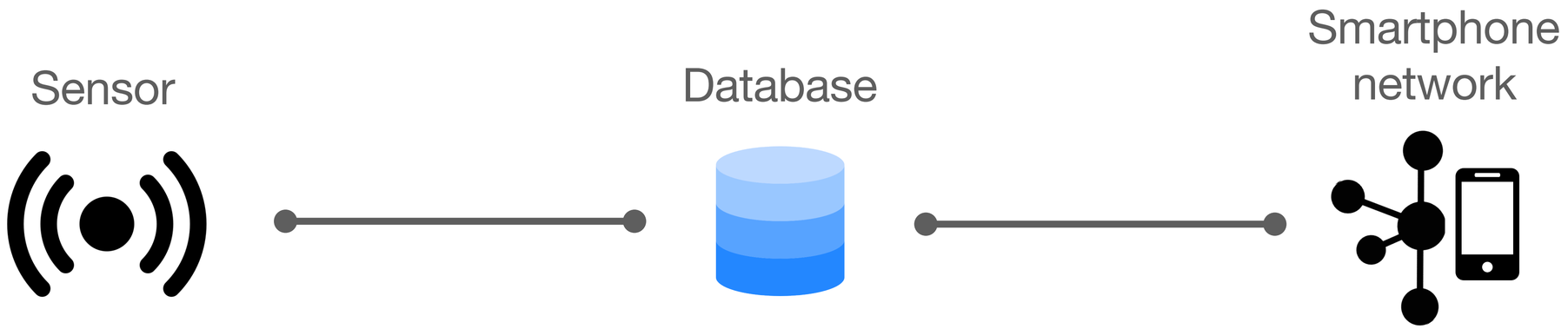
- the consumption history
- earn stars by decreasing water consumption
- level up and get rewarded

Feasibility

Only software required!

scalable automated



Future works

- Machine learning model improvement and mathematical optimization model;
- Integrate more data stations (different locations);
- Add weather constrains for more accurate prediction (rain, hail, extreme weather conditions)

Thank you for your attention!