akoios


Use Case #1:
Energy generation
prediction in wind turbines

Hardware provisioning

YAML

```
 titan: v1
service:
  image: tensorflow
  machine:
    cpu: 4
    memory: 4GB
  commands:
    - pip install -r requirements.txt
```

Imports

```
import pandas as pd
from sklearn.linear_model import LinearRegression
import json
```

Hardware provisioning

```
titan: v1
service:
  env: scipy
  hardware:
    cpu: 2
    memory: 2GB
  install:
    - pip install -r requirements.txt
```

Linear Regression

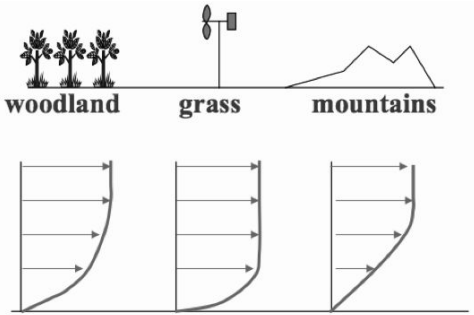
X_wind

v1: velocity [m/s] @ height h1 (2 meters above displacement height)

v2: velocity [m/s] @ height h2 (10 meters above displacement height)

v_50m: velocity [m/s] @ 50 meters above ground

z0: roughness length [m]



Linear Regression

y_prediction

DE_wind_generation_actual: Wind Generation in MW

Solution #1: Linear Regression

```
# Apply linear regression
lr = LinearRegression()
X_wind = combined[['v1', 'v2', 'v_50m', 'z0']]
y_wind = combined['DE_wind_generation_actual']

model = lr.fit(X_wind, y_wind)
```

Instrumentalization

```
input_params = [[1.44, 1.77, 2, 0.054]]
model.predict(input_params)
```

How could be expose a function?

Instrumentalization

```
# POST /prediction
body = json.loads(REQUEST)['body']
input_params = body['data']
print(model.predict(input_params))
```

Model coefficients

$$\text{Prediction (MW)} = \alpha + \beta_1 * v1 + \beta_2 * v2 + \beta_3 * v\_50m + \beta 4 * z0$$

Adding endpoints

GET /endpoint

Adding endpoints

```
# POST  /endpoint
```

Assignment #1

Develop and instrumentalize a new model to solve the use case

Assignment #2

Consume the service from a third party application using the generated REST API endpoints

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