Assignment 9 - Exponential Smoothing Method

June 29, 2019

0.1 Assignment 9

0.1.1 Problem

Find a suitable Python library that implements the exponential smoothing method. Solve the Regens Book problem.

0.1.2 Resolution

We can use the function *ExponentialSmoothing* from *statsmodels.tsa.holtwinters*.

```
In [1]: from statsmodels.tsa.holtwinters import ExponentialSmoothing
        import numpy as np


        # prepare data
        data = np.array([[1, 89], [2, 106], [3, 92], [4, 98], [5, 77], [6, 80], [7, 88], [8, 8
        data = np.array([89, 106, 92, 98, 77,80,88,87,92,86])
        # create class
        model = ExponentialSmoothing(data.astype(np.double))
        # fit model
        model_fit = model.fit()
        # make prediction
        yhat = model_fit.predict()
```

```
In [2]: print(data)
```

```
[ 89 106  92  98  77  80  88  87  92  86]
```

```
In [3]: print(model_fit)
        print(yhat)
```

```
<statsmodels.tsa.holtwinters.HoltWintersResultsWrapper object at 0x106b41550>
[89.49999991]
```

```
In [4]: data=np.append(data,88)
        print(data)
```

```
        # create class
        model = ExponentialSmoothing(data.astype(np.double))
        # fit model
        model_fit = model.fit()
        # make prediction
        yhat = model_fit.predict()
        print(yhat)
```

```
[ 89 106  92  98  77  80  88  87  92  86  88]
[89.36363644]
```

```
In [5]: data=np.append(data,int(yhat))
        print(data)
```

```
[ 89 106  92  98  77  80  88  87  92  86  88  89]
```

```
In [6]: # create class
        model = ExponentialSmoothing(data.astype(np.double))
        # fit model
        model_fit = model.fit()
        # make prediction
        yhat = model_fit.predict()
        print(yhat)
```

```
[89.33333318]
```

```
In [7]: data=np.append(data,int(yhat))
        print(data)
        # create class
        model = ExponentialSmoothing(data.astype(np.double))
        # fit model
        model_fit = model.fit()
        # make prediction
        yhat = model_fit.predict()
        print(yhat)
```

```
[ 89 106  92  98  77  80  88  87  92  86  88  89  89]
[89.30769219]
```