

main_auto

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1 Advanced Java & Advanced Python Assignment

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1.1.1 Auto Dataset

```
[ ]: from Class.ModelClass import * # Importing the Model class from ModelClass.py
      from functions.utils import * # Importing the utils functions from utils.py
```

Import the data, clean it, and prepare the input and output vectors

```
[ ]: x, y, df = import_clean_data('./data/Auto.csv', ['horsepower'], ['mpg'])
      X, y = prepare_vectors(x, y)
```

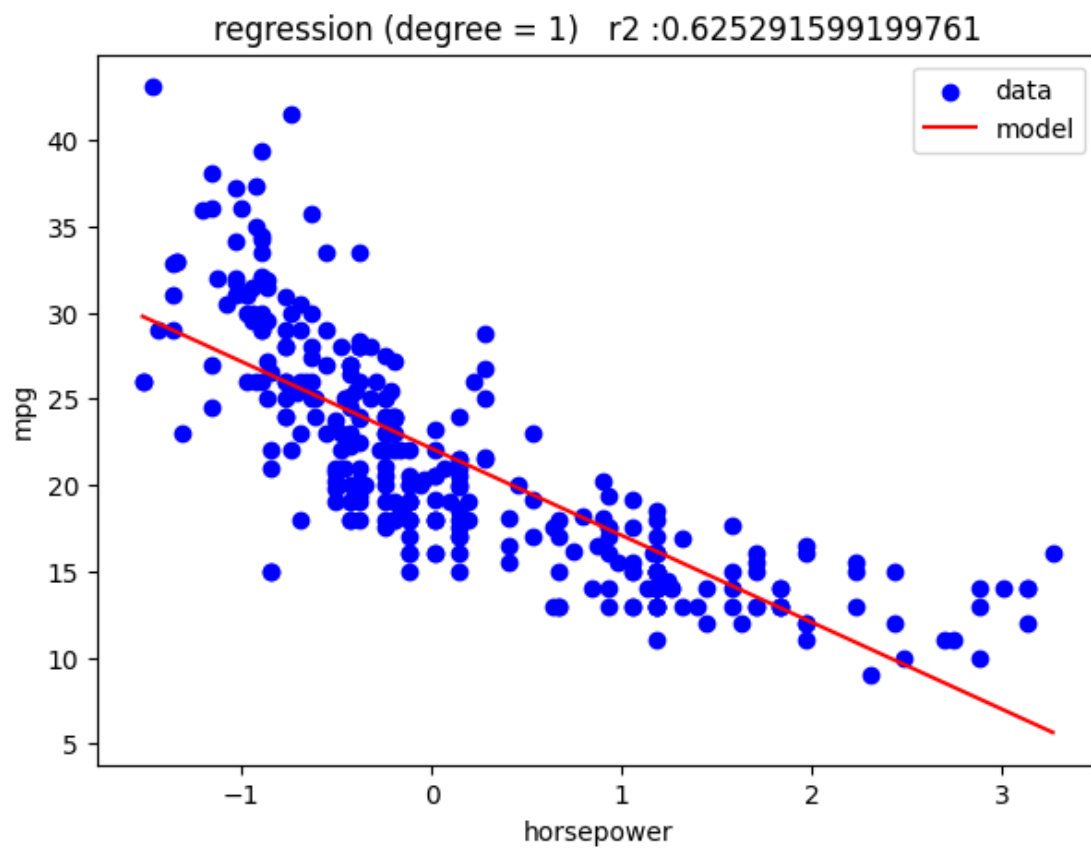
For each degree, compute the regression

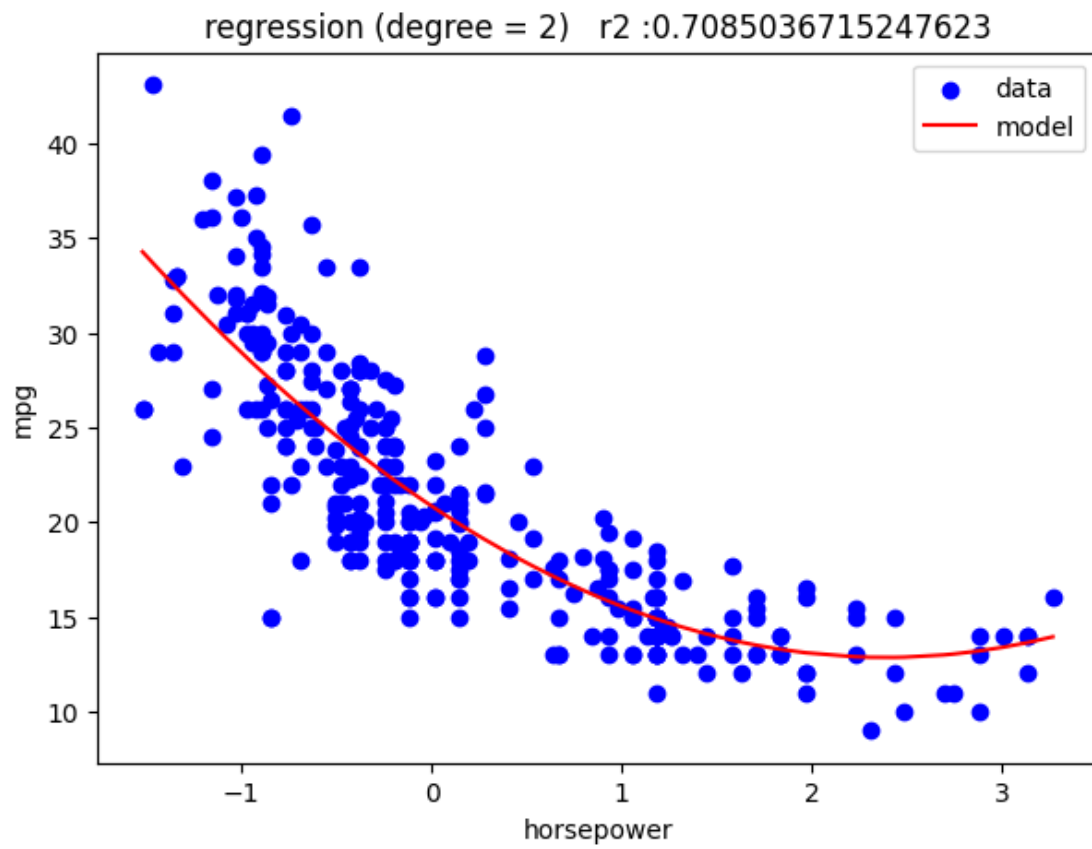
```
[ ]: degrees_list = [1, 2, 5]

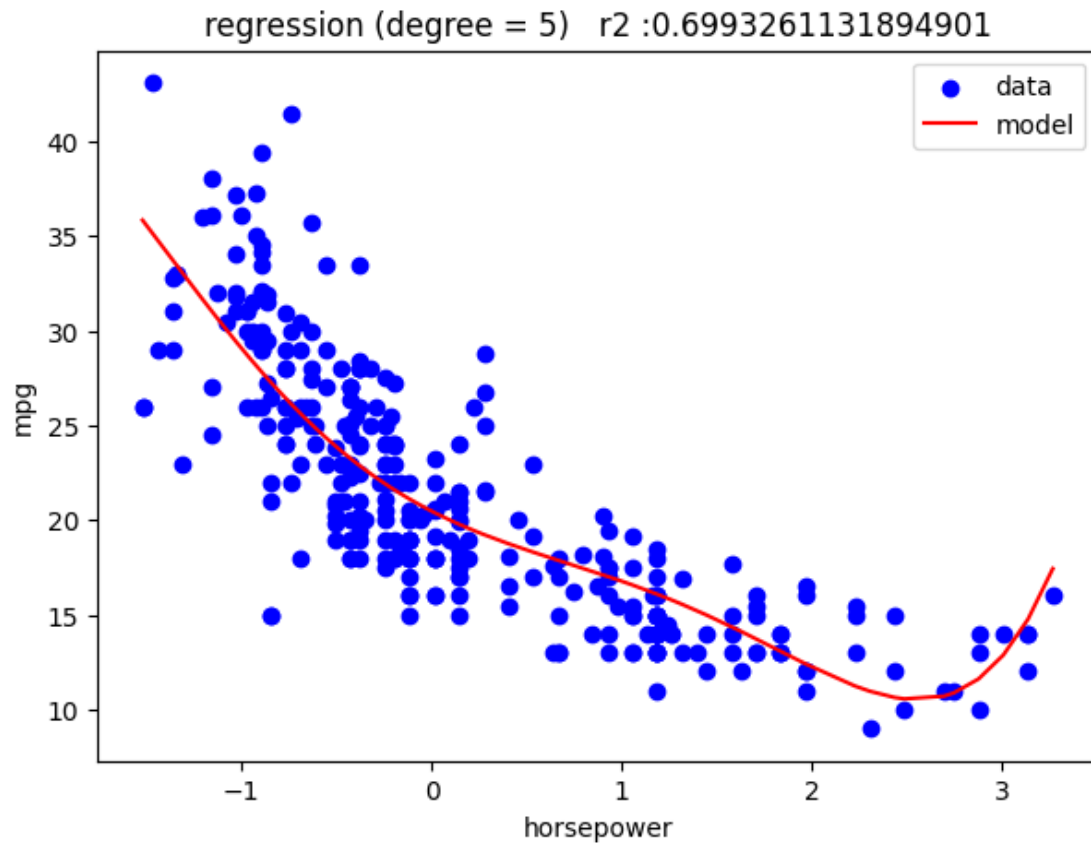
      model_list = []
      for i, degree in enumerate(degrees_list):
          model = Model(X, y, learning_rate=0.0008, iterations=6000, test_size=0.2)
          ↪ #Create the model with the chosen parameters
          model.transform(degree) #IMPORTANT STEP : Transforming X vector
          ↪ into polynomial vector
          model.compute_regression()
          model_list.append(model)
```

For each model, compute the regression and plot the results and r2 score

```
[ ]: for i, model in enumerate(model_list):
      model.compute_r_square()
      model.plot_regression_2D('horsepower', 'mpg', 'regression (degree = {})'.
          ↪ format(degrees_list[i]))
```





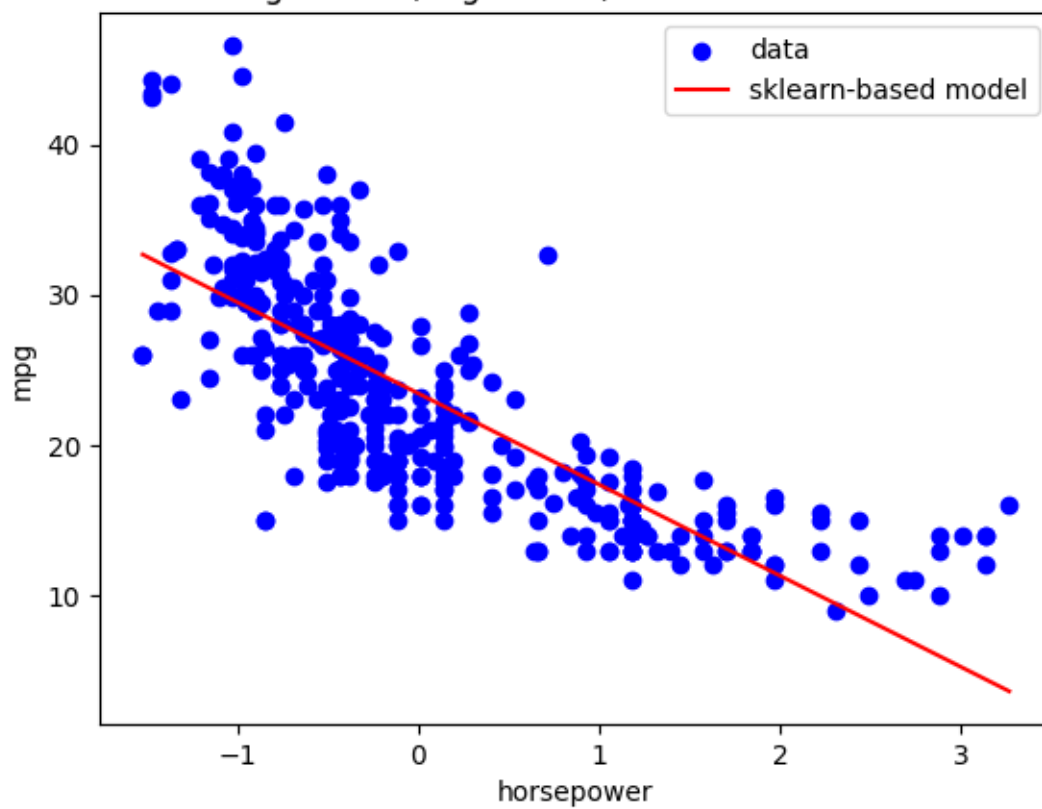


Check the previous results with the sklearn library

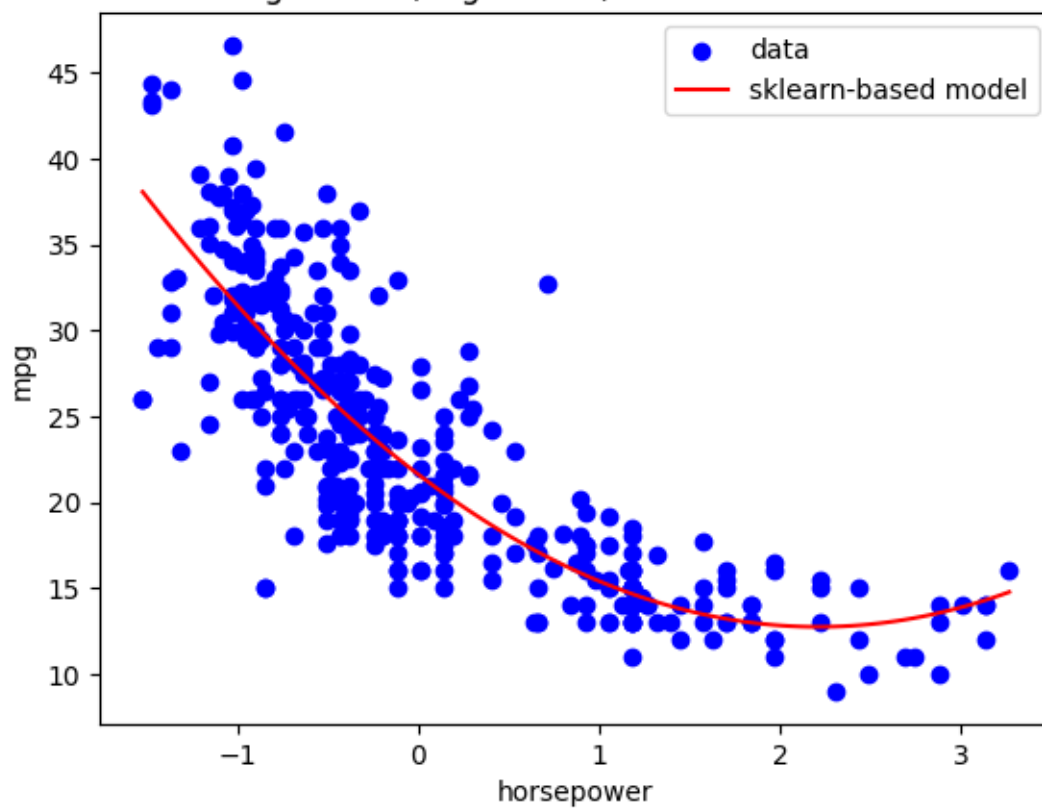
```
[ ]: #Do the same with sklearn

for i, degree in enumerate(degrees_list):
    sk_compute_plot(X, y, degree, 'horsepower', 'mpg', 'SKlearn regression_␣
    ↪(degree = {})'.format(degrees_list[i]))
```

SKlearn regression (degree = 1) r2 :0.6059482578894348



SKlearn regression (degree = 2) r2 :0.6875590305127517



SKlearn regression (degree = 5) $r^2 : 0.6967390038966409$

