

math456 hw6

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1 Prepping data

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn import datasets
from sklearn.linear_model import LassoCV
from sklearn.linear_model import Lasso
from sklearn.model_selection import KFold
from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import RepeatedKFold
X, y = datasets.load_diabetes(return_X_y=True)
X = X[:150]
y = y[:150]
```

2 Configuring model

```
lasso = Lasso(random_state=0, max_iter=10000)
alphas = np.logspace(-4, -0.5, 30)

    tuned_parameters = [{"alpha": alphas}
n_folds = 5

    clf = GridSearchCV(lasso, tuned_parameters, cv=n_folds, refit=False)
clf.fit(X, y)
scores = clf.cv_results_[ "mean_test_score" ]
scores_std = clf.cv_results_[ "std_test_score" ]
plt.figure().set_size_inches(8, 6)
plt.semilogx(alphas, scores)

    plot error lines showing +/- std. errors of the scores
std_error = scores_std / np.sqrt(n_folds)
```

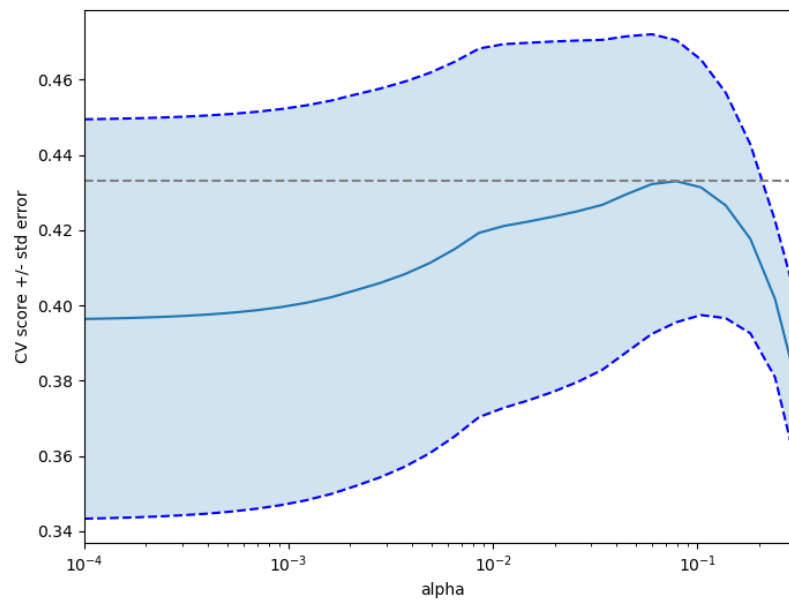
```
plt.semilogx(alphas, scores + std_error, "b-")
plt.semilogx(alphas, scores - std_error, "b-")
```

alpha=0.2 controls the translucency of the fill color

```
plt.fill_between(alphas, scores + std_error, scores - std_error, alpha=0.2)
```

3 Plot all alphas from 0 to 1

```
plt.ylabel("CV score +/- std error")
plt.xlabel("alpha")
plt.axhline(np.max(scores), linestyle="--", color=".5")
plt.xlim([alphas[0], alphas[-1]])
```



Plot of all alpha values from 0 to 1