

CHRIS ALBON

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Hyperparameter Tuning Using Random Search

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Preliminaries

```
# Load libraries
from scipy.stats import uniform
from sklearn import linear_model, datasets
from sklearn.model_selection import RandomizedSearchCV
```

Load Iris Dataset

```
# Load data
iris = datasets.load_iris()
X = iris.data
y = iris.target
```

Create Logistic Regression

```
# Create logistic regression
logistic = linear_model.LogisticRegression()
```

Create Hyperparameter Search Space

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```
# Create regularization hyperparameter distribution using uniform distribution
C = uniform(loc=0, scale=4)

# Create hyperparameter options
hyperparameters = dict(C=C, penalty=penalty)
```

Create Random Search

```
# Create randomized search 5-fold cross validation and 100 iterations
clf = RandomizedSearchCV(logistic, hyperparameters, random_state=1, n_iter=100,
cv=5, verbose=0, n_jobs=-1)
```

Conduct Random Search

```
# Fit randomized search
best_model = clf.fit(X, y)
```

View Hyperparameter Values Of Best Model

```
# View best hyperparameters
print('Best Penalty:', best_model.best_estimator_.get_params()['penalty'])
print('Best C:', best_model.best_estimator_.get_params()['C'])
```

```
Best Penalty: l1
Best C: 1.66808801881
```

Predict Using Best Model

```
# Predict target vector
best_model.predict(X)
```

$$\begin{aligned} &0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, \\ &1, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 1, 1, 1, 1, 1, 1, \\ &1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, \\ &2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 1, 2, 2, 2, 1, 2, 2, 2, \\ &2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2] \end{aligned}$$

Everything on this site is available on GitHub. Head to [and submit a change](#).

https://chrisalbon.com/code/machine_learning/model_selection/hyperparameter_tuning_using_random_search/