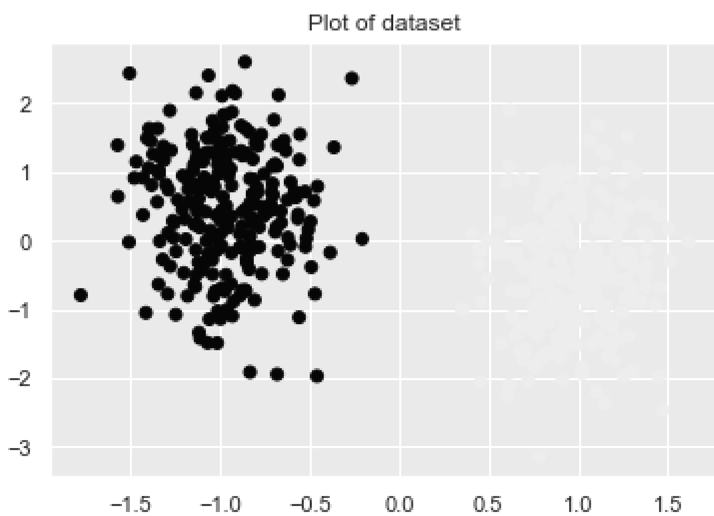
In [23]:
```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
from scipy import stats

# use seaborn plotting defaults
import seaborn as sns; sns.set()
from sklearn.datasets import make_blobs
X, y = make_blobs(n_samples = 500, centers = 2, n_features = 2, random_state=7)
```

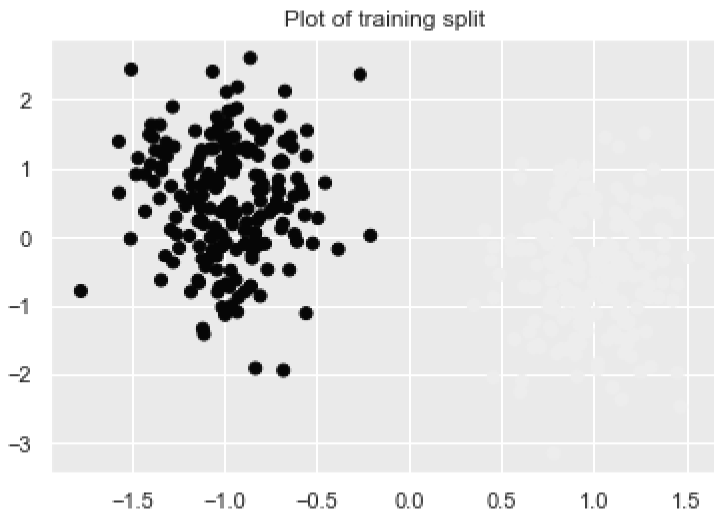
In [24]:
```
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
scaler.fit(X)
X = scaler.transform(X)
plt.title("Plot of dataset")
plt.scatter(X[:, 0], X[:, 1], c=y)
```

Out[24]:
```
<matplotlib.collections.PathCollection at 0x1be944aec40>
```



In [25]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=
plt.title("Plot of training split")
plt.scatter(X_train[:, 0], X_train[:, 1], c=y_train)
```

Out[25]:
```
<matplotlib.collections.PathCollection at 0x1be944a1580>
```



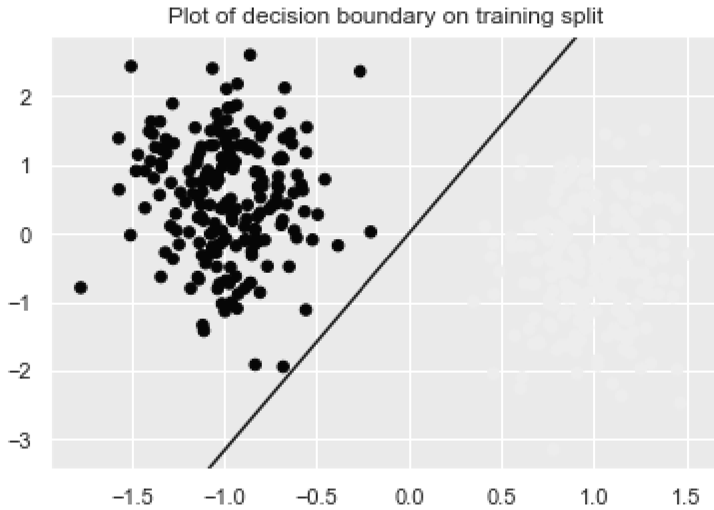
In [26]:
```
#Creating a classifier
from sklearn.datasets import load_digits
from sklearn.linear_model import Perceptron
from sklearn.model_selection import cross_val_score
classifier = Perceptron(max_iter=100, eta0=0.1, random_state=0)
#eta0: Constant by which the updates are multiplied.#eta0double, default=1

classifier.fit(X_train, y_train) #Training the model using classifier
#Getting cross validation score to predict the model accuracy
scores = cross_val_score(classifier, X_train, y_train, cv=5)
print("Accuracy: %0.4f (+/- %0.4f)" % (scores.mean(), scores.std() * 2))
```

```
Accuracy: 0.9975 (+/- 0.0100)
```

In [27]:
```
plt.scatter(X_train[:, 0], X_train[:, 1], c=y_train, s=30)
ax = plt.gca()
plt.title("Plot of decision boundary on training split")
xlim = ax.get_xlim()
ylim = ax.get_ylim()
# create grid to evaluate model
xx = np.linspace(xlim[0], xlim[1], 30)
yy = np.linspace(ylim[0], ylim[1], 30)
YY, XX = np.meshgrid(yy, xx)
xy = np.vstack([XX.ravel(), YY.ravel()]).T
Z = classifier.decision_function(xy).reshape(XX.shape)
# plot decision boundary and margins
ax.contour(XX, YY, Z, colors='k', levels=[0], alpha=1,
linestyles=['-'])
```

Out[27]:
```
<matplotlib.contour.QuadContourSet at 0x1be945971f0>
```



In [28]:
```
from sklearn import metrics
y_pred = classifier.predict(X_test)
print("Accuracy: %0.4f"% metrics.accuracy_score(y_test, y_pred))
```

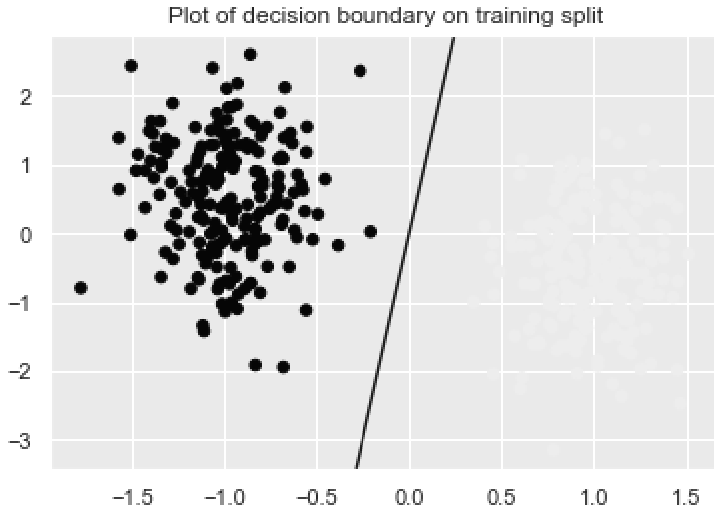
```
Accuracy: 0.9900
```

In [29]:
```
#Creating an SVM classifier
from sklearn import svm
classifier = svm.SVC(kernel="linear")
#Training the model using classifier
classifier.fit(X_train, y_train)
#Getting cross validation score to predict the model accuracy
scores = cross_val_score(classifier, X_train, y_train, cv=5)
print("Accuracy: %0.4f (+/- %0.4f)" % (scores.mean(), scores.std() * 2))
```

```
Accuracy: 1.0000 (+/- 0.0000)
```

In [30]:
```
plt.scatter(X_train[:, 0], X_train[:, 1], c=y_train, s=30)
ax = plt.gca()
plt.title("Plot of decision boundary on training split")
xlim = ax.get_xlim()
ylim = ax.get_ylim()
# create grid to evaluate model
xx = np.linspace(xlim[0], xlim[1], 30)
yy = np.linspace(ylim[0], ylim[1], 30)
YY, XX = np.meshgrid(yy, xx)
xy = np.vstack([XX.ravel(), YY.ravel()]).T
Z = classifier.decision_function(xy).reshape(XX.shape)
# plot decision boundary and margins
ax.contour(XX, YY, Z, colors='k', levels=[0], alpha=1,
linestyles=['-'])
```

Out[30]:
```
<matplotlib.contour.QuadContourSet at 0x1be9460ea90>
```



In [31]:
```
y_pred = classifier.predict(X_test)
print("Accuracy: %0.4f" % metrics.accuracy_score(y_test, y_pred))
```

```
Accuracy: 1.0000
```

In [ ]: