hyptn-copy

February 13, 2024

[2]:
```
# Importing the necessary packages
import pandas as pd
import numpy as np
import keras
from sklearn.preprocessing import StandardScaler

import warnings
warnings.simplefilter(action='ignore')
```

[3]:
```
# Load the dataset
dataset = pd.read_csv('D:/Chools/Day_10/diabetes.csv')
```

[4]:
```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 768 entries, 0 to 767
Data columns (total 9 columns):
 #   Column                    Non-Null Count  Dtype  
---  ------                    --------------  -----  
 0   Pregnancies               768 non-null    int64  
 1   Glucose                   768 non-null    int64  
 2   BloodPressure             768 non-null    int64  
 3   SkinThickness             768 non-null    int64  
 4   Insulin                   768 non-null    int64  
 5   BMI                       768 non-null    float64
 6   DiabetesPedigreeFunction  768 non-null    float64
 7   Age                       768 non-null    int64  
 8   Outcome                   768 non-null    int64  
dtypes: float64(2), int64(7)
memory usage: 54.1 KB
```

[5]:
```
# Split features and target variable
X = dataset.drop('Outcome', axis=1)
y = dataset['Outcome']
```

[6]:
```
# Standardization
a = StandardScaler()
a.fit(X)
```

```
X_standardized = a.transform(X)
```

[7]:
```
pd.DataFrame(X_standardized).describe()
```

[7]:

	0	1	2	3	4	\
count	7.680000e+02	7.680000e+02	7.680000e+02	7.680000e+02	7.680000e+02	
mean	-6.476301e-17	-9.251859e-18	1.503427e-17	1.006140e-16	-3.006854e-17	
std	1.000652e+00	1.000652e+00	1.000652e+00	1.000652e+00	1.000652e+00	
min	-1.141852e+00	-3.783654e+00	-3.572597e+00	-1.288212e+00	-6.928906e-01	
25%	-8.448851e-01	-6.852363e-01	-3.673367e-01	-1.288212e+00	-6.928906e-01	
50%	-2.509521e-01	-1.218877e-01	1.496408e-01	1.545332e-01	-4.280622e-01	
75%	6.399473e-01	6.057709e-01	5.632228e-01	7.190857e-01	4.120079e-01	
max	3.906578e+00	2.444478e+00	2.734528e+00	4.921866e+00	6.652839e+00	

	5	6	7
count	7.680000e+02	7.680000e+02	7.680000e+02
mean	2.590520e-16	2.451743e-16	1.931325e-16
std	1.000652e+00	1.000652e+00	1.000652e+00
min	-4.060474e+00	-1.189553e+00	-1.041549e+00
25%	-5.955785e-01	-6.889685e-01	-7.862862e-01
50%	9.419788e-04	-3.001282e-01	-3.608474e-01
75%	5.847705e-01	4.662269e-01	6.602056e-01
max	4.455807e+00	5.883565e+00	4.063716e+00

Tuning of Hyperparameters :- Batch Size and Epochs

[24]:
```
# Importing the necessary packages
from sklearn.model_selection import GridSearchCV, KFold
from keras.models import Sequential
from keras.layers import Dense
# from keras.wrappers.scikit_learn import KerasClassifier
from scikeras.wrappers import KerasClassifier
from keras.optimizers import Adam
```

[25]:
```
# Define the create_model function
def create_model(learning_rate=0.01):
    model = Sequential()
    model.add(Dense(12, input_dim=8, kernel_initializer='uniform',␣
 ↪activation='relu'))
    model.add(Dense(8, kernel_initializer='uniform', activation='relu'))
    model.add(Dense(1, kernel_initializer='uniform', activation='sigmoid'))

    adam = Adam(learning_rate=learning_rate)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
    return model
```

[26]:
```
# Create the model
model = KerasClassifier(build_fn=create_model, verbose=0)

# Define the grid search parameters
batch_size = [10, 20, 40]
epochs = [10, 50, 100]
learning_rate = [0.01, 0.001]  # Add learning rate as a parameter to be tuned

# Make a dictionary of the grid search parameters
param_grid = dict(batch_size=batch_size, epochs=epochs)

# Build and fit the GridSearchCV
grid = GridSearchCV(estimator=model, param_grid=param_grid, cv=KFold(),␣
 ↪verbose=10)
grid_result = grid.fit(X_standardized, y)
```

```
Fitting 5 folds for each of 9 candidates, totalling 45 fits
[CV 1/5; 1/9] START batch_size=10, epochs=10…
[CV 1/5; 1/9] END …batch_size=10, epochs=10;, score=0.747 total time=   0.8s
[CV 2/5; 1/9] START batch_size=10, epochs=10…
[CV 2/5; 1/9] END …batch_size=10, epochs=10;, score=0.701 total time=   0.8s
[CV 3/5; 1/9] START batch_size=10, epochs=10…
[CV 3/5; 1/9] END …batch_size=10, epochs=10;, score=0.766 total time=   0.8s
[CV 4/5; 1/9] START batch_size=10, epochs=10…
[CV 4/5; 1/9] END …batch_size=10, epochs=10;, score=0.843 total time=   0.8s
[CV 5/5; 1/9] START batch_size=10, epochs=10…
[CV 5/5; 1/9] END …batch_size=10, epochs=10;, score=0.778 total time=   0.8s
[CV 1/5; 2/9] START batch_size=10, epochs=50…
[CV 1/5; 2/9] END …batch_size=10, epochs=50;, score=0.708 total time=   2.4s
[CV 2/5; 2/9] START batch_size=10, epochs=50…
[CV 2/5; 2/9] END …batch_size=10, epochs=50;, score=0.682 total time=   2.5s
[CV 3/5; 2/9] START batch_size=10, epochs=50…
[CV 3/5; 2/9] END …batch_size=10, epochs=50;, score=0.766 total time=   2.6s
[CV 4/5; 2/9] START batch_size=10, epochs=50…
[CV 4/5; 2/9] END …batch_size=10, epochs=50;, score=0.791 total time=   2.8s
[CV 5/5; 2/9] START batch_size=10, epochs=50…
[CV 5/5; 2/9] END …batch_size=10, epochs=50;, score=0.797 total time=   2.8s
[CV 1/5; 3/9] START batch_size=10, epochs=100…
[CV 1/5; 3/9] END …batch_size=10, epochs=100;, score=0.753 total time=   5.7s
[CV 2/5; 3/9] START batch_size=10, epochs=100…
[CV 2/5; 3/9] END …batch_size=10, epochs=100;, score=0.688 total time=   5.2s
[CV 3/5; 3/9] START batch_size=10, epochs=100…
[CV 3/5; 3/9] END …batch_size=10, epochs=100;, score=0.753 total time=   5.5s
[CV 4/5; 3/9] START batch_size=10, epochs=100…
[CV 4/5; 3/9] END …batch_size=10, epochs=100;, score=0.778 total time=   5.3s
[CV 5/5; 3/9] START batch_size=10, epochs=100…
[CV 5/5; 3/9] END …batch_size=10, epochs=100;, score=0.784 total time=   5.2s
```

```
[CV 1/5; 4/9] START batch_size=20, epochs=10…
[CV 1/5; 4/9] END …batch_size=20, epochs=10;, score=0.734 total time=   0.7s
[CV 2/5; 4/9] START batch_size=20, epochs=10…
[CV 2/5; 4/9] END …batch_size=20, epochs=10;, score=0.695 total time=   0.6s
[CV 3/5; 4/9] START batch_size=20, epochs=10…
[CV 3/5; 4/9] END …batch_size=20, epochs=10;, score=0.773 total time=   0.6s
[CV 4/5; 4/9] START batch_size=20, epochs=10…
[CV 4/5; 4/9] END …batch_size=20, epochs=10;, score=0.843 total time=   0.7s
[CV 5/5; 4/9] START batch_size=20, epochs=10…
[CV 5/5; 4/9] END …batch_size=20, epochs=10;, score=0.771 total time=   0.6s
[CV 1/5; 5/9] START batch_size=20, epochs=50…
[CV 1/5; 5/9] END …batch_size=20, epochs=50;, score=0.740 total time=   1.7s
[CV 2/5; 5/9] START batch_size=20, epochs=50…
[CV 2/5; 5/9] END …batch_size=20, epochs=50;, score=0.695 total time=   1.4s
[CV 3/5; 5/9] START batch_size=20, epochs=50…
[CV 3/5; 5/9] END …batch_size=20, epochs=50;, score=0.773 total time=   1.4s
[CV 4/5; 5/9] START batch_size=20, epochs=50…
[CV 4/5; 5/9] END …batch_size=20, epochs=50;, score=0.797 total time=   1.4s
[CV 5/5; 5/9] START batch_size=20, epochs=50…
[CV 5/5; 5/9] END …batch_size=20, epochs=50;, score=0.765 total time=   1.4s
[CV 1/5; 6/9] START batch_size=20, epochs=100…
[CV 1/5; 6/9] END …batch_size=20, epochs=100;, score=0.753 total time=   2.5s
[CV 2/5; 6/9] START batch_size=20, epochs=100…
[CV 2/5; 6/9] END …batch_size=20, epochs=100;, score=0.695 total time=   2.5s
[CV 3/5; 6/9] START batch_size=20, epochs=100…
[CV 3/5; 6/9] END …batch_size=20, epochs=100;, score=0.760 total time=   2.5s
[CV 4/5; 6/9] START batch_size=20, epochs=100…
[CV 4/5; 6/9] END …batch_size=20, epochs=100;, score=0.784 total time=   2.5s
[CV 5/5; 6/9] START batch_size=20, epochs=100…
[CV 5/5; 6/9] END …batch_size=20, epochs=100;, score=0.752 total time=   2.5s
[CV 1/5; 7/9] START batch_size=40, epochs=10…
[CV 1/5; 7/9] END …batch_size=40, epochs=10;, score=0.747 total time=   0.4s
[CV 2/5; 7/9] START batch_size=40, epochs=10…
[CV 2/5; 7/9] END …batch_size=40, epochs=10;, score=0.740 total time=   0.4s
[CV 3/5; 7/9] START batch_size=40, epochs=10…
[CV 3/5; 7/9] END …batch_size=40, epochs=10;, score=0.773 total time=   0.4s
[CV 4/5; 7/9] START batch_size=40, epochs=10…
[CV 4/5; 7/9] END …batch_size=40, epochs=10;, score=0.843 total time=   0.4s
[CV 5/5; 7/9] START batch_size=40, epochs=10…
[CV 5/5; 7/9] END …batch_size=40, epochs=10;, score=0.765 total time=   0.4s
[CV 1/5; 8/9] START batch_size=40, epochs=50…
[CV 1/5; 8/9] END …batch_size=40, epochs=50;, score=0.747 total time=   0.9s
[CV 2/5; 8/9] START batch_size=40, epochs=50…
[CV 2/5; 8/9] END …batch_size=40, epochs=50;, score=0.695 total time=   0.9s
[CV 3/5; 8/9] START batch_size=40, epochs=50…
[CV 3/5; 8/9] END …batch_size=40, epochs=50;, score=0.753 total time=   0.9s
[CV 4/5; 8/9] START batch_size=40, epochs=50…
[CV 4/5; 8/9] END …batch_size=40, epochs=50;, score=0.804 total time=   0.9s
```

```
[CV 5/5; 8/9] START batch_size=40, epochs=50…
[CV 5/5; 8/9] END …batch_size=40, epochs=50;, score=0.771 total time=   0.9s
[CV 1/5; 9/9] START batch_size=40, epochs=100…
[CV 1/5; 9/9] END …batch_size=40, epochs=100;, score=0.747 total time=   1.5s
[CV 2/5; 9/9] START batch_size=40, epochs=100…
[CV 2/5; 9/9] END …batch_size=40, epochs=100;, score=0.695 total time=   1.5s
[CV 3/5; 9/9] START batch_size=40, epochs=100…
[CV 3/5; 9/9] END …batch_size=40, epochs=100;, score=0.734 total time=   1.5s
[CV 4/5; 9/9] START batch_size=40, epochs=100…
[CV 4/5; 9/9] END …batch_size=40, epochs=100;, score=0.797 total time=   2.0s
[CV 5/5; 9/9] START batch_size=40, epochs=100…
[CV 5/5; 9/9] END …batch_size=40, epochs=100;, score=0.778 total time=   1.5s
```

[27]:
```
# Summarize the results
print('Best : {}, using {}'.format(grid_result.best_score_,grid_result.
  ↪best_params_))
means = grid_result.cv_results_['mean_test_score']
stds = grid_result.cv_results_['std_test_score']
params = grid_result.cv_results_['params']
for mean, stdev, param in zip(means, stds, params):
  print('{},{} with: {}'.format(mean, stdev, param))
```

```
Best : 0.7735166793990322, using {'batch_size': 40, 'epochs': 10}
0.7670401493930906,0.04613071167935996 with: {'batch_size': 10, 'epochs': 10}
0.7488158899923606,0.0460453591743617 with: {'batch_size': 10, 'epochs': 50}
0.7513793396146337,0.033958958814046536 with: {'batch_size': 10, 'epochs': 100}
0.7631355572532044,0.04917230904824848 with: {'batch_size': 20, 'epochs': 10}
0.7539767422120363,0.03475760566580164 with: {'batch_size': 20, 'epochs': 50}
0.7487479840421016,0.02940797353592768 with: {'batch_size': 20, 'epochs': 100}
0.7735166793990322,0.036735767771314834 with: {'batch_size': 40, 'epochs': 10}
0.753993718699601,0.03562738075215721 with: {'batch_size': 40, 'epochs': 50}
0.750097614803497,0.03560195909720659 with: {'batch_size': 40, 'epochs': 100}
```

Tuning of Hyperparameters:- Learning rate and Drop out rate

[11]:
```
from keras.layers import Dropout
from keras.optimizers import Adam
from keras.models import Sequential
from keras.wrappers.scikit_learn import KerasClassifier
from sklearn.model_selection import GridSearchCV, KFold

# Defining the model
def create_model(learning_rate, dropout_rate, activation_function,␣
  ↪kernel_initializer):
    model = Sequential()
    model.add(Dense(8, input_dim=8, kernel_initializer=kernel_initializer,␣
  ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
```

```
    model.add(Dense(4, kernel_initializer=kernel_initializer,␣
 ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
    model.add(Dense(1, activation='sigmoid'))

    adam = Adam(lr=learning_rate)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
    return model

# Create the model with dropout_rate parameter in KerasClassifier constructor
model = KerasClassifier(build_fn=create_model, verbose=0, batch_size=40,␣
 ↪epochs=10, dropout_rate=0.0)

# Define the grid search parameters
learning_rate = [0.001, 0.01, 0.1]
dropout_rate = [0.0, 0.1, 0.2]
activation_function = ['relu', 'sigmoid', 'tanh', 'linear']  # Add activation␣
 ↪function parameter
kernel_initializer = ['glorot_uniform', 'normal', 'zero']  # Add kernel␣
 ↪initializer parameter

# Make a dictionary of the grid search parameters
param_grids = dict(learning_rate=learning_rate, dropout_rate=dropout_rate,
                   activation_function=activation_function,␣
 ↪kernel_initializer=kernel_initializer)

# Build and fit the GridSearchCV
grid = GridSearchCV(estimator=model, param_grid=param_grids, cv=KFold(),␣
 ↪verbose=10)
grid_result = grid.fit(X_standardized, y)
```

```
Fitting 5 folds for each of 108 candidates, totalling 540 fits
[CV 1/5; 1/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 1/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.649 total time=
0.6s
[CV 2/5; 1/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 1/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.675 total time=
0.5s
[CV 3/5; 1/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 1/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.727 total time=
```

```
0.5s
[CV 4/5; 1/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 1/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.739 total time=
0.5s
[CV 5/5; 1/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 1/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.627 total time=
0.6s
[CV 1/5; 2/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 2/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.760 total time=
0.6s
[CV 2/5; 2/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 2/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.721 total time=
0.6s
[CV 3/5; 2/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 2/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.5s
[CV 4/5; 2/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 2/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.837 total time=
0.6s
[CV 5/5; 2/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 2/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.745 total time=
0.6s
[CV 1/5; 3/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 3/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.740 total time=
0.5s
[CV 2/5; 3/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 3/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.682 total time=
0.6s
[CV 3/5; 3/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
```

```
[CV 3/5; 3/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.760 total time=
0.5s
[CV 4/5; 3/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 3/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.830 total time=
0.5s
[CV 5/5; 3/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 3/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.745 total time=
0.5s
[CV 1/5; 4/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 4/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.773 total time=   0.5s
[CV 2/5; 4/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 4/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   0.9s
[CV 3/5; 4/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 4/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.727 total time=   0.5s
[CV 4/5; 4/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 4/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.745 total time=   0.5s
[CV 5/5; 4/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 4/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.771 total time=   0.5s
[CV 1/5; 5/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 5/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 2/5; 5/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 5/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.714 total time=   0.5s
[CV 3/5; 5/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 5/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.773 total time=   0.5s
[CV 4/5; 5/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 5/108] END activation_function=relu, dropout_rate=0.0,
```

```
kernel_initializer=normal, learning_rate=0.01;, score=0.850 total time=   0.6s
[CV 5/5; 5/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 5/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.778 total time=   0.5s
[CV 1/5; 6/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 6/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.721 total time=   0.6s
[CV 2/5; 6/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 6/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.669 total time=   0.7s
[CV 3/5; 6/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 6/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.779 total time=   0.7s
[CV 4/5; 6/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 6/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.778 total time=   0.7s
[CV 5/5; 6/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 6/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.765 total time=   0.6s
[CV 1/5; 7/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 7/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.5s
[CV 2/5; 7/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 7/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 7/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 7/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.5s
[CV 4/5; 7/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 7/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.5s
[CV 5/5; 7/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 7/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.5s
[CV 1/5; 8/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 8/108] END activation_function=relu, dropout_rate=0.0,
```

```
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.8s
[CV 2/5; 8/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 8/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.5s
[CV 3/5; 8/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 8/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.5s
[CV 4/5; 8/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 8/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.5s
[CV 5/5; 8/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 8/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.5s
[CV 1/5; 9/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 9/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.5s
[CV 2/5; 9/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 9/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.5s
[CV 3/5; 9/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 9/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.5s
[CV 4/5; 9/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 9/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 9/108] START activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 9/108] END activation_function=relu, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 10/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 10/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.682 total time=
0.6s
[CV 2/5; 10/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 10/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.630 total time=
0.6s
[CV 3/5; 10/108] START activation_function=relu, dropout_rate=0.1,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 10/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.727 total time=
0.5s
[CV 4/5; 10/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 10/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.732 total time=
0.6s
[CV 5/5; 10/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 10/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.654 total time=
0.6s
[CV 1/5; 11/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 11/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.753 total time=
0.6s
[CV 2/5; 11/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 11/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.708 total time=
0.6s
[CV 3/5; 11/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 11/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.5s
[CV 4/5; 11/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 11/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
0.5s
[CV 5/5; 11/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 11/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.739 total time=
0.9s
[CV 1/5; 12/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 12/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.727 total time=
0.6s
[CV 2/5; 12/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 12/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.682 total time=
```

```
0.5s
[CV 3/5; 12/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 12/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.760 total time=
0.6s
[CV 4/5; 12/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 12/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.771 total time=
0.6s
[CV 5/5; 12/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 12/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.758 total time=
0.6s
[CV 1/5; 13/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 13/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 13/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 13/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.727 total time=   0.6s
[CV 3/5; 13/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 13/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 13/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 13/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.791 total time=   0.6s
[CV 5/5; 13/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 13/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.752 total time=   0.6s
[CV 1/5; 14/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 14/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.6s
[CV 2/5; 14/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 14/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.714 total time=   0.6s
[CV 3/5; 14/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 14/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.740 total time=   0.6s
```

```
[CV 4/5; 14/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 14/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.837 total time=   0.6s
[CV 5/5; 14/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 14/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.758 total time=   0.6s
[CV 1/5; 15/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 15/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.734 total time=   0.5s
[CV 2/5; 15/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 15/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.688 total time=   0.6s
[CV 3/5; 15/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 15/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.760 total time=   0.9s
[CV 4/5; 15/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 15/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.817 total time=   0.5s
[CV 5/5; 15/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 15/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.765 total time=   0.6s
[CV 1/5; 16/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 16/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 16/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 16/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 16/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 16/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.5s
[CV 4/5; 16/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 16/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 16/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 16/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.5s
```

```
[CV 1/5; 17/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 17/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.5s
[CV 2/5; 17/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 17/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.5s
[CV 3/5; 17/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 17/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.5s
[CV 4/5; 17/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 17/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 17/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 17/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.5s
[CV 1/5; 18/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 18/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.5s
[CV 2/5; 18/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 18/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.5s
[CV 3/5; 18/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 18/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.5s
[CV 4/5; 18/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 18/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 18/108] START activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 18/108] END activation_function=relu, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.5s
[CV 1/5; 19/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 19/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.643 total time=
1.0s
[CV 2/5; 19/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 19/108] END activation_function=relu, dropout_rate=0.2,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.656 total time=
0.6s
[CV 3/5; 19/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 19/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.630 total time=
0.6s
[CV 4/5; 19/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 19/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.771 total time=
0.5s
[CV 5/5; 19/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 19/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.647 total time=
0.6s
[CV 1/5; 20/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 20/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.6s
[CV 2/5; 20/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 20/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.675 total time=
0.6s
[CV 3/5; 20/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 20/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.773 total time=
0.6s
[CV 4/5; 20/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 20/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.824 total time=
0.6s
[CV 5/5; 20/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 20/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.778 total time=
0.5s
[CV 1/5; 21/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 21/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.708 total time=
0.5s
[CV 2/5; 21/108] START activation_function=relu, dropout_rate=0.2,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 21/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.682 total time=
0.5s
[CV 3/5; 21/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 21/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.714 total time=
0.6s
[CV 4/5; 21/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 21/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.856 total time=
0.5s
[CV 5/5; 21/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 21/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.699 total time=
0.5s
[CV 1/5; 22/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 22/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.714 total time=   0.5s
[CV 2/5; 22/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 22/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 22/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 22/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 22/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 22/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.817 total time=   0.9s
[CV 5/5; 22/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 22/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.758 total time=   0.6s
[CV 1/5; 23/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 23/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.740 total time=   0.6s
[CV 2/5; 23/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 23/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.727 total time=   0.6s
[CV 3/5; 23/108] START activation_function=relu, dropout_rate=0.2,
```

```
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 23/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.773 total time=   0.6s
[CV 4/5; 23/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 23/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.824 total time=   0.7s
[CV 5/5; 23/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 23/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.765 total time=   0.6s
[CV 1/5; 24/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 24/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.747 total time=   0.7s
[CV 2/5; 24/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 24/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.669 total time=   0.6s
[CV 3/5; 24/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 24/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.740 total time=   0.7s
[CV 4/5; 24/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 24/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.837 total time=   0.6s
[CV 5/5; 24/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 24/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.778 total time=   0.6s
[CV 1/5; 25/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 25/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 25/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 25/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 25/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 25/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 25/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 25/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 25/108] START activation_function=relu, dropout_rate=0.2,
```

```
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 25/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.5s
[CV 1/5; 26/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 26/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.6s
[CV 2/5; 26/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 26/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.9s
[CV 3/5; 26/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 26/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.6s
[CV 4/5; 26/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 26/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 26/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 26/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.6s
[CV 1/5; 27/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 27/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.6s
[CV 2/5; 27/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 27/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.6s
[CV 3/5; 27/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 27/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.7s
[CV 4/5; 27/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 27/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 27/108] START activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 27/108] END activation_function=relu, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 28/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 28/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.649 total time=
0.5s
```

```
[CV 2/5; 28/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 28/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.584 total time=
0.6s
[CV 3/5; 28/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 28/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.675 total time=
0.6s
[CV 4/5; 28/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 28/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.745 total time=
0.5s
[CV 5/5; 28/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 28/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.647 total time=
0.5s
[CV 1/5; 29/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 29/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.5s
[CV 2/5; 29/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 29/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.714 total time=
0.5s
[CV 3/5; 29/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 29/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.5s
[CV 4/5; 29/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 29/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.837 total time=
0.5s
[CV 5/5; 29/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 29/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.745 total time=
0.5s
[CV 1/5; 30/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 30/108] END activation_function=sigmoid, dropout_rate=0.0,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.760 total time=
0.9s
[CV 2/5; 30/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 30/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.714 total time=
0.5s
[CV 3/5; 30/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 30/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.766 total time=
0.5s
[CV 4/5; 30/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 30/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.843 total time=
0.5s
[CV 5/5; 30/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 30/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.765 total time=
0.5s
[CV 1/5; 31/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 31/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.649 total time=   0.5s
[CV 2/5; 31/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 31/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 31/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 31/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 31/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 31/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.752 total time=   0.5s
[CV 5/5; 31/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 31/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.353 total time=   0.5s
[CV 1/5; 32/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 32/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.6s
[CV 2/5; 32/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
```

```
[CV 2/5; 32/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.714 total time=   0.6s
[CV 3/5; 32/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 32/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.747 total time=   0.5s
[CV 4/5; 32/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 32/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.837 total time=   0.5s
[CV 5/5; 32/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 32/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.771 total time=   0.5s
[CV 1/5; 33/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 33/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.714 total time=   0.5s
[CV 2/5; 33/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 33/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.701 total time=   0.5s
[CV 3/5; 33/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 33/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.786 total time=   0.5s
[CV 4/5; 33/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 33/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.810 total time=   0.5s
[CV 5/5; 33/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 33/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.758 total time=   0.9s
[CV 1/5; 34/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 34/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.5s
[CV 2/5; 34/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 34/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 34/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 34/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.5s
[CV 4/5; 34/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
```

```
[CV 4/5; 34/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.5s
[CV 5/5; 34/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 34/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 35/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 35/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.766 total time=   0.5s
[CV 2/5; 35/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 35/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.721 total time=   0.5s
[CV 3/5; 35/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 35/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.747 total time=   0.6s
[CV 4/5; 35/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 35/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.824 total time=   0.6s
[CV 5/5; 35/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 35/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.5s
[CV 1/5; 36/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 36/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.747 total time=   0.5s
[CV 2/5; 36/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 36/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.695 total time=   0.5s
[CV 3/5; 36/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 36/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.747 total time=   0.6s
[CV 4/5; 36/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 36/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.837 total time=   0.5s
[CV 5/5; 36/108] START activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 36/108] END activation_function=sigmoid, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.752 total time=   0.6s
[CV 1/5; 37/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
```

```
[CV 1/5; 37/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.649 total time=
0.6s
[CV 2/5; 37/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 37/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.584 total time=
0.6s
[CV 3/5; 37/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 37/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.630 total time=
0.6s
[CV 4/5; 37/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 37/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.745 total time=
1.0s
[CV 5/5; 37/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 37/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.647 total time=
0.6s
[CV 1/5; 38/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 38/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.753 total time=
0.7s
[CV 2/5; 38/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 38/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.721 total time=
0.7s
[CV 3/5; 38/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 38/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.7s
[CV 4/5; 38/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 38/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.837 total time=
0.7s
[CV 5/5; 38/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 38/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.778 total time=
0.6s
```

```
[CV 1/5; 39/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 39/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.747 total time=
0.6s
[CV 2/5; 39/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 39/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.695 total time=
0.6s
[CV 3/5; 39/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 39/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.779 total time=
0.6s
[CV 4/5; 39/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 39/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.863 total time=
0.6s
[CV 5/5; 39/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 39/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.745 total time=
0.7s
[CV 1/5; 40/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 40/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 40/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 40/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 40/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 40/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.526 total time=   0.6s
[CV 4/5; 40/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 40/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 40/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 40/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 41/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 41/108] END activation_function=sigmoid, dropout_rate=0.1,
```

```
kernel_initializer=normal, learning_rate=0.01;, score=0.766 total time=   0.6s
[CV 2/5; 41/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 41/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.708 total time=   0.6s
[CV 3/5; 41/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 41/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.740 total time=   1.1s
[CV 4/5; 41/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 41/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.837 total time=   0.6s
[CV 5/5; 41/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 41/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.752 total time=   0.6s
[CV 1/5; 42/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 42/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.760 total time=   0.6s
[CV 2/5; 42/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 42/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.734 total time=   0.7s
[CV 3/5; 42/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 42/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.740 total time=   0.7s
[CV 4/5; 42/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 42/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.863 total time=   0.6s
[CV 5/5; 42/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 42/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.752 total time=   0.6s
[CV 1/5; 43/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 43/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 43/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 43/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 43/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 43/108] END activation_function=sigmoid, dropout_rate=0.1,
```

```
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 43/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 43/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 43/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 43/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 44/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 44/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 2/5; 44/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 44/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.714 total time=   0.6s
[CV 3/5; 44/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 44/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 4/5; 44/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 44/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.810 total time=   0.6s
[CV 5/5; 44/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 44/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.752 total time=   0.6s
[CV 1/5; 45/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 45/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.734 total time=   0.6s
[CV 2/5; 45/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 45/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.708 total time=   1.1s
[CV 3/5; 45/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 45/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.786 total time=   0.6s
[CV 4/5; 45/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 45/108] END activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.856 total time=   0.6s
[CV 5/5; 45/108] START activation_function=sigmoid, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 45/108] END activation_function=sigmoid, dropout_rate=0.1,
```

```
kernel_initializer=zero, learning_rate=0.1;, score=0.771 total time=   0.6s
[CV 1/5; 46/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 46/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.669 total time=
0.6s
[CV 2/5; 46/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 46/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.584 total time=
0.6s
[CV 3/5; 46/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 46/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.630 total time=
0.6s
[CV 4/5; 46/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 46/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.745 total time=
0.6s
[CV 5/5; 46/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 46/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.647 total time=
0.6s
[CV 1/5; 47/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 47/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.779 total time=
0.6s
[CV 2/5; 47/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 47/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.701 total time=
0.6s
[CV 3/5; 47/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 47/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.6s
[CV 4/5; 47/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 47/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
0.6s
[CV 5/5; 47/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
```

```
[CV 5/5; 47/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.745 total time=
0.6s
[CV 1/5; 48/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 48/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.721 total time=
0.6s
[CV 2/5; 48/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 48/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.740 total time=
0.6s
[CV 3/5; 48/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 48/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.786 total time=
0.6s
[CV 4/5; 48/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 48/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.830 total time=
0.6s
[CV 5/5; 48/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 48/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.752 total time=
0.6s
[CV 1/5; 49/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 49/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.649 total time=   0.9s
[CV 2/5; 49/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 49/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 49/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 49/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 49/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 49/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 49/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 49/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.647 total time=   0.6s
```

```
[CV 1/5; 50/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 50/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.6s
[CV 2/5; 50/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 50/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.714 total time=   0.6s
[CV 3/5; 50/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 50/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 4/5; 50/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 50/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.830 total time=   0.6s
[CV 5/5; 50/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 50/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.739 total time=   0.6s
[CV 1/5; 51/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 51/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.734 total time=   0.6s
[CV 2/5; 51/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 51/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.669 total time=   0.6s
[CV 3/5; 51/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 51/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.792 total time=   0.6s
[CV 4/5; 51/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 51/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.758 total time=   0.6s
[CV 5/5; 51/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 51/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.752 total time=   0.6s
[CV 1/5; 52/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 52/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 52/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 52/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
```

```
[CV 3/5; 52/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 52/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 52/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 52/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 52/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 52/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   1.0s
[CV 1/5; 53/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 53/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 2/5; 53/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 53/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.714 total time=   0.6s
[CV 3/5; 53/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 53/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.773 total time=   0.6s
[CV 4/5; 53/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 53/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.817 total time=   0.6s
[CV 5/5; 53/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 53/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.752 total time=   0.6s
[CV 1/5; 54/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 54/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.740 total time=   0.6s
[CV 2/5; 54/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 54/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.714 total time=   0.6s
[CV 3/5; 54/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 54/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.792 total time=   0.6s
[CV 4/5; 54/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 54/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.830 total time=   0.6s
```

```
[CV 5/5; 54/108] START activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 54/108] END activation_function=sigmoid, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 1/5; 55/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 55/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.708 total time=
0.5s
[CV 2/5; 55/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 55/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.682 total time=
0.5s
[CV 3/5; 55/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 55/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.734 total time=
0.5s
[CV 4/5; 55/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 55/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.824 total time=
0.5s
[CV 5/5; 55/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 55/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.765 total time=
0.5s
[CV 1/5; 56/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 56/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.5s
[CV 2/5; 56/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 56/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.740 total time=
0.5s
[CV 3/5; 56/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 56/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.779 total time=
0.5s
[CV 4/5; 56/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 56/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
```

```
0.9s
[CV 5/5; 56/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 56/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.765 total time=
0.5s
[CV 1/5; 57/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 57/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.747 total time=
0.5s
[CV 2/5; 57/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 57/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.688 total time=
0.5s
[CV 3/5; 57/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 57/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.740 total time=
0.5s
[CV 4/5; 57/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 57/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.843 total time=
0.5s
[CV 5/5; 57/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 57/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.739 total time=
0.5s
[CV 1/5; 58/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 58/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.753 total time=   0.5s
[CV 2/5; 58/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 58/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.701 total time=   0.5s
[CV 3/5; 58/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 58/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   0.5s
[CV 4/5; 58/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 58/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.830 total time=   0.5s
[CV 5/5; 58/108] START activation_function=tanh, dropout_rate=0.0,
```

```
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 58/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.758 total time=   0.5s
[CV 1/5; 59/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 59/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.5s
[CV 2/5; 59/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 59/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.727 total time=   0.5s
[CV 3/5; 59/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 59/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.5s
[CV 4/5; 59/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 59/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.856 total time=   0.5s
[CV 5/5; 59/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 59/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.771 total time=   0.5s
[CV 1/5; 60/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 60/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.714 total time=   0.5s
[CV 2/5; 60/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 60/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.701 total time=   0.5s
[CV 3/5; 60/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 60/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.727 total time=   0.5s
[CV 4/5; 60/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 60/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.843 total time=   0.9s
[CV 5/5; 60/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 60/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.778 total time=   0.5s
[CV 1/5; 61/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 61/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.5s
[CV 2/5; 61/108] START activation_function=tanh, dropout_rate=0.0,
```

```
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 61/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 61/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 61/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.5s
[CV 4/5; 61/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 61/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.5s
[CV 5/5; 61/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 61/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.5s
[CV 1/5; 62/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 62/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.5s
[CV 2/5; 62/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 62/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.5s
[CV 3/5; 62/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 62/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.5s
[CV 4/5; 62/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 62/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.5s
[CV 5/5; 62/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 62/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.5s
[CV 1/5; 63/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 63/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.5s
[CV 2/5; 63/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 63/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.5s
[CV 3/5; 63/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 63/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.5s
[CV 4/5; 63/108] START activation_function=tanh, dropout_rate=0.0,
```

```
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 63/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.5s
[CV 5/5; 63/108] START activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 63/108] END activation_function=tanh, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.5s
[CV 1/5; 64/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 64/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.701 total time=
0.6s
[CV 2/5; 64/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 64/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.708 total time=
0.6s
[CV 3/5; 64/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 64/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.727 total time=
0.6s
[CV 4/5; 64/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 64/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.810 total time=
0.9s
[CV 5/5; 64/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 64/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.725 total time=
0.6s
[CV 1/5; 65/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 65/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.6s
[CV 2/5; 65/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 65/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.727 total time=
0.6s
[CV 3/5; 65/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 65/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.760 total time=
0.6s
[CV 4/5; 65/108] START activation_function=tanh, dropout_rate=0.1,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 65/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.850 total time=
0.6s
[CV 5/5; 65/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 65/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.765 total time=
0.6s
[CV 1/5; 66/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 66/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.753 total time=
0.6s
[CV 2/5; 66/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 66/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.740 total time=
0.6s
[CV 3/5; 66/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 66/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.747 total time=
0.6s
[CV 4/5; 66/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 66/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.817 total time=
0.6s
[CV 5/5; 66/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 66/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.745 total time=
0.6s
[CV 1/5; 67/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 67/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.766 total time=   0.6s
[CV 2/5; 67/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 67/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.695 total time=   0.6s
[CV 3/5; 67/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 67/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   0.6s
[CV 4/5; 67/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
```

```
[CV 4/5; 67/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.837 total time=   0.6s
[CV 5/5; 67/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 67/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.758 total time=   0.6s
[CV 1/5; 68/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 68/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.6s
[CV 2/5; 68/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 68/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.727 total time=   0.6s
[CV 3/5; 68/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 68/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.747 total time=   0.9s
[CV 4/5; 68/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 68/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.843 total time=   0.6s
[CV 5/5; 68/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 68/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 1/5; 69/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 69/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.753 total time=   0.6s
[CV 2/5; 69/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 69/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.734 total time=   0.6s
[CV 3/5; 69/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 69/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.779 total time=   0.6s
[CV 4/5; 69/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 69/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.843 total time=   0.6s
[CV 5/5; 69/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 69/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.752 total time=   0.6s
[CV 1/5; 70/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
```

```
[CV 1/5; 70/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 70/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 70/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 70/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 70/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 70/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 70/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 70/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 70/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 71/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 71/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.6s
[CV 2/5; 71/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 71/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.6s
[CV 3/5; 71/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 71/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.6s
[CV 4/5; 71/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 71/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 71/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 71/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.6s
[CV 1/5; 72/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 72/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.6s
[CV 2/5; 72/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 72/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.9s
[CV 3/5; 72/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
```

```
[CV 3/5; 72/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.6s
[CV 4/5; 72/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 72/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 72/108] START activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 72/108] END activation_function=tanh, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 73/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 73/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.734 total time=
0.6s
[CV 2/5; 73/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 73/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.688 total time=
0.6s
[CV 3/5; 73/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 73/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.747 total time=
0.6s
[CV 4/5; 73/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 73/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.784 total time=
0.6s
[CV 5/5; 73/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 73/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.765 total time=
0.6s
[CV 1/5; 74/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 74/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.734 total time=
0.6s
[CV 2/5; 74/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 74/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.753 total time=
0.6s
[CV 3/5; 74/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 74/108] END activation_function=tanh, dropout_rate=0.2,
```

```
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.740 total time=
0.6s
[CV 4/5; 74/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 74/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
0.6s
[CV 5/5; 74/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 74/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.752 total time=
0.6s
[CV 1/5; 75/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 75/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.766 total time=
0.6s
[CV 2/5; 75/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 75/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.701 total time=
0.6s
[CV 3/5; 75/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 75/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.747 total time=
0.6s
[CV 4/5; 75/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 75/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.824 total time=
0.6s
[CV 5/5; 75/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 75/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.758 total time=
0.6s
[CV 1/5; 76/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 76/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   1.0s
[CV 2/5; 76/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 76/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.688 total time=   0.6s
[CV 3/5; 76/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 76/108] END activation_function=tanh, dropout_rate=0.2,
```

```
kernel_initializer=normal, learning_rate=0.001;, score=0.760 total time=   0.6s
[CV 4/5; 76/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 76/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.817 total time=   0.6s
[CV 5/5; 76/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 76/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.765 total time=   0.6s
[CV 1/5; 77/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 77/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 2/5; 77/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 77/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.740 total time=   0.6s
[CV 3/5; 77/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 77/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.753 total time=   0.6s
[CV 4/5; 77/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 77/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.843 total time=   0.6s
[CV 5/5; 77/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 77/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.752 total time=   0.6s
[CV 1/5; 78/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 78/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.727 total time=   0.6s
[CV 2/5; 78/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 78/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.675 total time=   0.6s
[CV 3/5; 78/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 78/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.740 total time=   0.6s
[CV 4/5; 78/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 78/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.863 total time=   0.6s
[CV 5/5; 78/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 78/108] END activation_function=tanh, dropout_rate=0.2,
```

```
kernel_initializer=normal, learning_rate=0.1;, score=0.758 total time=   0.6s
[CV 1/5; 79/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 79/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 79/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 79/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 79/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 79/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 79/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 79/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 79/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 79/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   1.0s
[CV 1/5; 80/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 80/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.6s
[CV 2/5; 80/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 80/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.6s
[CV 3/5; 80/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 80/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.6s
[CV 4/5; 80/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 80/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 80/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 80/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.6s
[CV 1/5; 81/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 81/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.6s
[CV 2/5; 81/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 81/108] END activation_function=tanh, dropout_rate=0.2,
```

```
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.6s
[CV 3/5; 81/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 81/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.6s
[CV 4/5; 81/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 81/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 81/108] START activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 81/108] END activation_function=tanh, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 82/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 82/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.753 total time=
0.5s
[CV 2/5; 82/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 82/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.662 total time=
0.5s
[CV 3/5; 82/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 82/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.708 total time=
0.5s
[CV 4/5; 82/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 82/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.784 total time=
0.5s
[CV 5/5; 82/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 82/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.745 total time=
0.5s
[CV 1/5; 83/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 83/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.5s
[CV 2/5; 83/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 83/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.727 total time=
0.5s
```

```
[CV 3/5; 83/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 83/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
0.5s
[CV 4/5; 83/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 83/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
0.5s
[CV 5/5; 83/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 83/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.771 total time=
0.5s
[CV 1/5; 84/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 84/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.753 total time=
0.9s
[CV 2/5; 84/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 84/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.747 total time=
0.5s
[CV 3/5; 84/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 84/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.779 total time=
0.5s
[CV 4/5; 84/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 84/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.830 total time=
0.5s
[CV 5/5; 84/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 84/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.745 total time=
0.5s
[CV 1/5; 85/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 85/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   0.5s
[CV 2/5; 85/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 85/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.682 total time=   0.5s
```

```
[CV 3/5; 85/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 85/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.760 total time=   0.5s
[CV 4/5; 85/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 85/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.824 total time=   0.5s
[CV 5/5; 85/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 85/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.001;, score=0.771 total time=   0.5s
[CV 1/5; 86/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 86/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.5s
[CV 2/5; 86/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 86/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.721 total time=   0.5s
[CV 3/5; 86/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 86/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.760 total time=   0.5s
[CV 4/5; 86/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 86/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.830 total time=   0.5s
[CV 5/5; 86/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 86/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.01;, score=0.758 total time=   0.5s
[CV 1/5; 87/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 87/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.760 total time=   0.5s
[CV 2/5; 87/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 87/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.727 total time=   0.5s
[CV 3/5; 87/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 87/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.747 total time=   0.5s
[CV 4/5; 87/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 87/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.856 total time=   0.5s
```

```
[CV 5/5; 87/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 87/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=normal, learning_rate=0.1;, score=0.739 total time=   0.5s
[CV 1/5; 88/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 88/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.5s
[CV 2/5; 88/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 88/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.5s
[CV 3/5; 88/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 88/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.9s
[CV 4/5; 88/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 88/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.5s
[CV 5/5; 88/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 88/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.5s
[CV 1/5; 89/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 89/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.5s
[CV 2/5; 89/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 89/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.5s
[CV 3/5; 89/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 89/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.5s
[CV 4/5; 89/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 89/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.5s
[CV 5/5; 89/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 89/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.5s
[CV 1/5; 90/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 90/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.5s
```

```
[CV 2/5; 90/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 90/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.5s
[CV 3/5; 90/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 90/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.5s
[CV 4/5; 90/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 90/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.5s
[CV 5/5; 90/108] START activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 90/108] END activation_function=linear, dropout_rate=0.0,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 91/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 91/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.701 total time=
0.6s
[CV 2/5; 91/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 91/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.662 total time=
0.6s
[CV 3/5; 91/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 91/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.766 total time=
0.6s
[CV 4/5; 91/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 91/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.778 total time=
0.6s
[CV 5/5; 91/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 91/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.732 total time=
0.6s
[CV 1/5; 92/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 92/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.779 total time=
0.6s
[CV 2/5; 92/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
```

```
[CV 2/5; 92/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.747 total time=
0.6s
[CV 3/5; 92/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 92/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.760 total time=
1.0s
[CV 4/5; 92/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 92/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.837 total time=
0.6s
[CV 5/5; 92/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 92/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.758 total time=
0.6s
[CV 1/5; 93/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 93/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.734 total time=
0.6s
[CV 2/5; 93/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 93/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.727 total time=
0.6s
[CV 3/5; 93/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 93/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.766 total time=
0.6s
[CV 4/5; 93/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 93/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.830 total time=
0.6s
[CV 5/5; 93/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 93/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.752 total time=
0.6s
[CV 1/5; 94/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 1/5; 94/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.747 total time=   0.7s
[CV 2/5; 94/108] START activation_function=linear, dropout_rate=0.1,
```

```
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 94/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.682 total time=   0.7s
[CV 3/5; 94/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 94/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.753 total time=   0.6s
[CV 4/5; 94/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 94/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.804 total time=   0.6s
[CV 5/5; 94/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 94/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.001;, score=0.771 total time=   0.6s
[CV 1/5; 95/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 95/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.773 total time=   0.6s
[CV 2/5; 95/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 95/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.727 total time=   0.6s
[CV 3/5; 95/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 95/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.773 total time=   0.6s
[CV 4/5; 95/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 95/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.837 total time=   0.6s
[CV 5/5; 95/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 95/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.01;, score=0.771 total time=   0.6s
[CV 1/5; 96/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 96/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.766 total time=   0.6s
[CV 2/5; 96/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 96/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.740 total time=   0.6s
[CV 3/5; 96/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 3/5; 96/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.701 total time=   1.0s
[CV 4/5; 96/108] START activation_function=linear, dropout_rate=0.1,
```

```
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 96/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.830 total time=   0.6s
[CV 5/5; 96/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 96/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=normal, learning_rate=0.1;, score=0.771 total time=   0.6s
[CV 1/5; 97/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 97/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 97/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 97/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 97/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 97/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 97/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 97/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 97/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 97/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 98/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 98/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.6s
[CV 2/5; 98/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 98/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.6s
[CV 3/5; 98/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 98/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.6s
[CV 4/5; 98/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 98/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 98/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01
[CV 5/5; 98/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.6s
[CV 1/5; 99/108] START activation_function=linear, dropout_rate=0.1,
```

```
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 99/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.6s
[CV 2/5; 99/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 99/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.6s
[CV 3/5; 99/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 99/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   0.6s
[CV 4/5; 99/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 99/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 99/108] START activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 99/108] END activation_function=linear, dropout_rate=0.1,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
[CV 1/5; 100/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 1/5; 100/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.727 total time=
0.6s
[CV 2/5; 100/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 2/5; 100/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.649 total time=
0.6s
[CV 3/5; 100/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 3/5; 100/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.617 total time=
1.0s
[CV 4/5; 100/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 4/5; 100/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.693 total time=
0.6s
[CV 5/5; 100/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001
[CV 5/5; 100/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.001;, score=0.739 total time=
0.6s
[CV 1/5; 101/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 1/5; 101/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.766 total time=
```

```
0.6s
[CV 2/5; 101/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 2/5; 101/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.727 total time=
0.6s
[CV 3/5; 101/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 3/5; 101/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.760 total time=
0.6s
[CV 4/5; 101/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 4/5; 101/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.830 total time=
0.6s
[CV 5/5; 101/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01
[CV 5/5; 101/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.01;, score=0.771 total time=
0.6s
[CV 1/5; 102/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 1/5; 102/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.766 total time=
0.6s
[CV 2/5; 102/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 2/5; 102/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.688 total time=
0.6s
[CV 3/5; 102/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 3/5; 102/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.773 total time=
0.6s
[CV 4/5; 102/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 4/5; 102/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.824 total time=
0.6s
[CV 5/5; 102/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1
[CV 5/5; 102/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=glorot_uniform, learning_rate=0.1;, score=0.745 total time=
0.6s
[CV 1/5; 103/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
```

```
[CV 1/5; 103/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.753 total time=   0.6s
[CV 2/5; 103/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 2/5; 103/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.675 total time=   0.7s
[CV 3/5; 103/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 3/5; 103/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.753 total time=   0.6s
[CV 4/5; 103/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 4/5; 103/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.837 total time=   0.6s
[CV 5/5; 103/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001
[CV 5/5; 103/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.001;, score=0.765 total time=   0.6s
[CV 1/5; 104/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 1/5; 104/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.766 total time=   0.6s
[CV 2/5; 104/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 2/5; 104/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.727 total time=   0.6s
[CV 3/5; 104/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 3/5; 104/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.773 total time=   0.9s
[CV 4/5; 104/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 4/5; 104/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.824 total time=   0.6s
[CV 5/5; 104/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01
[CV 5/5; 104/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.01;, score=0.791 total time=   0.6s
[CV 1/5; 105/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 1/5; 105/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.760 total time=   0.6s
[CV 2/5; 105/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 2/5; 105/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.688 total time=   0.6s
[CV 3/5; 105/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
```

```
[CV 3/5; 105/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.636 total time=   0.6s
[CV 4/5; 105/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 4/5; 105/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.817 total time=   0.6s
[CV 5/5; 105/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1
[CV 5/5; 105/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=normal, learning_rate=0.1;, score=0.752 total time=   0.6s
[CV 1/5; 106/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 1/5; 106/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.649 total time=   0.6s
[CV 2/5; 106/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 2/5; 106/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.584 total time=   0.6s
[CV 3/5; 106/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 3/5; 106/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.630 total time=   0.6s
[CV 4/5; 106/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 4/5; 106/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.745 total time=   0.6s
[CV 5/5; 106/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001
[CV 5/5; 106/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.001;, score=0.647 total time=   0.6s
[CV 1/5; 107/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 1/5; 107/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.649 total time=   0.6s
[CV 2/5; 107/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 2/5; 107/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.584 total time=   0.6s
[CV 3/5; 107/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 3/5; 107/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.630 total time=   0.6s
[CV 4/5; 107/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
[CV 4/5; 107/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.745 total time=   0.6s
[CV 5/5; 107/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01
```

```
[CV 5/5; 107/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.01;, score=0.647 total time=   0.6s
[CV 1/5; 108/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 1/5; 108/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.649 total time=   0.6s
[CV 2/5; 108/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 2/5; 108/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.584 total time=   0.6s
[CV 3/5; 108/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 3/5; 108/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.630 total time=   1.0s
[CV 4/5; 108/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 4/5; 108/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.745 total time=   0.6s
[CV 5/5; 108/108] START activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1
[CV 5/5; 108/108] END activation_function=linear, dropout_rate=0.2,
kernel_initializer=zero, learning_rate=0.1;, score=0.647 total time=   0.6s
```

[12]:
```
# Summarize the results
print('Best : {}, using {}'.format(grid_result.best_score_,grid_result.
  ↪best_params_))
means = grid_result.cv_results_['mean_test_score']
stds = grid_result.cv_results_['std_test_score']
params = grid_result.cv_results_['params']
for mean, stdev, param in zip(means, stds, params):
  print('{},{} with: {}'.format(mean, stdev, param))
```

```
Best : 0.7761225700378418, using {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.6835922360420227,0.04317951184336888 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7656905174255371,0.038743037620730746 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7513963222503662,0.0474620854735074 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7526186347007752,0.017231110570084692 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7735421419143677,0.04413110172855617 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7422629714012146,0.04239020086519357 with: {'activation_function': 'relu',
```

'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.6849164009094239,0.040085222020177586 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7591800332069397,0.04043635949301256 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7396485924720764,0.03238013428478328 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7097954392433167,0.06110211630535889 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7618113994598389,0.040827058814553764 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7527035117149353,0.0420278421420817 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.669374418258667,0.051617403050115286 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7592224836349487,0.04869575629857728 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.731890344619751,0.06310647708811883 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7007469654083252,0.08432137682106527 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7656990170478821,0.03322189541900743 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7540446639060974,0.05455893993250921 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',

'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.6602495551109314,0.05190395721939031 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7578983306884766,0.04125164349467054 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7696205735206604,0.04147262802366141 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.5936423003673553,0.13221150592069658 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7657244801521301,0.040238364759913534 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7539852380752563,0.04138908882098616 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.7604787468910217,0.034668466204399104 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.7553094148635864,0.04567068310297551 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7709277629852295,0.03797226847345224 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7657244801521301,0.05551585558110422 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.6303794264793396,0.07322791385861488 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7605042099952698,0.04263958004712103 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7696290731430053,0.04741498720284765 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.7565741419792176,0.0307840131395222 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.7709447503089905,0.0507123818926685 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.6550547480583191,0.0528879618322809 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7604872345924377,0.04271016588712822 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':

0.01}
0.7656905293464661,0.03848741030001538 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7591800332069397,0.038732018050911164 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7409218311309814,0.04072041791366568 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.7617774367332458,0.033465904194078536 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.764383339881897,0.041356904541319815 with: {'activation_function': 'sigmoid',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.7423223972320556,0.04903448147671944 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7722010135650634,0.03200489949023797 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7514048218727112,0.05041104636051405 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7579068064689636,0.041370330588890544 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7722434401512146,0.0442614021251715 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7527544498443604,0.052100043980027426 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.7344622850418091,0.03929014918369784 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7735251665115357,0.04064180033270654 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7604702591896058,0.028565635679185703 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7605126976966858,0.04546315676319408 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.001}

0.764400315284729,0.04070300964193521 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7722010016441345,0.038316382916247296 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.7435701727867127,0.03245459933256323 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7617944240570068,0.03488993818398683 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7591970205307007,0.03923337602642129 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7553009152412414,0.04116977234630419 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7683048963546752,0.03773016933332268 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7527544498443604,0.06152735296580065 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.7305576801300049,0.0419241365283788 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7722094893455506,0.03298171906814581 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7708768367767334,0.03203190959134863 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7566165924072266,0.045591815820642916 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7656990051269531,0.03546410796658488 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.765707504749298,0.04647477511283046 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.001}

0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.7279348134994507,0.04238003709806891 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7760971069335938,0.03200158553859148 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7617944240570068,0.03677278312036153 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7513963222503662,0.04004708778748517 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7761140823364258,0.03490232472915417 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.7618198871612549,0.04217428717681933 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'kernel_initializer': 'zero', 'learning_rate': 0.1}
0.6849758148193359,0.046103522775146275 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.001}
0.7709107875823975,0.03331758881402414 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.01}
0.7591800332069397,0.043805819555908544 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'glorot_uniform', 'learning_rate':
0.1}
0.7566250681877136,0.051174368455066496 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.001}
0.7761225700378418,0.03149577654701802 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.01}
0.730608606338501,0.06232849990615238 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'normal', 'learning_rate': 0.1}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.001}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.01}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'kernel_initializer': 'zero', 'learning_rate': 0.1}

Tuning of Hyperparameters:- Activation Function and Kernel Initializer

[14]:
```
from keras.layers import Dropout
from keras.optimizers import Adam
from keras.models import Sequential
from keras.wrappers.scikit_learn import KerasClassifier
from sklearn.model_selection import GridSearchCV, KFold

# Defining the model
def create_model(activation_function, init, dropout_rate=0.1):
    model = Sequential()
    model.add(Dense(8, input_dim=8, kernel_initializer=init,␣
 ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
    model.add(Dense(4, input_dim=8, kernel_initializer=init,␣
 ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
    model.add(Dense(1, activation='sigmoid'))

    adam = Adam(lr=0.001)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
    return model

# Create the model
model = KerasClassifier(build_fn=create_model, verbose=0, batch_size=40,␣
 ↪epochs=10)

# Define the grid search parameters
activation_function = ['softmax', 'relu', 'tanh', 'linear']
init = ['uniform', 'normal', 'zero']
dropout_rate = [0.0, 0.1, 0.2]  # Add dropout rate parameter

# Make a dictionary of the grid search parameters
param_grids = dict(activation_function=activation_function, init=init,␣
 ↪dropout_rate=dropout_rate)

# Build and fit the GridSearchCV
grid = GridSearchCV(estimator=model, param_grid=param_grids, cv=KFold(),␣
 ↪verbose=10)
grid_result = grid.fit(X_standardized, y)
```

```
Fitting 5 folds for each of 36 candidates, totalling 180 fits
[CV 1/5; 1/36] START activation_function=softmax, dropout_rate=0.0, init=uniform
[CV 1/5; 1/36] END activation_function=softmax, dropout_rate=0.0, init=uniform;,
score=0.649 total time=   0.7s
[CV 2/5; 1/36] START activation_function=softmax, dropout_rate=0.0, init=uniform
[CV 2/5; 1/36] END activation_function=softmax, dropout_rate=0.0, init=uniform;,
```

```
score=0.584 total time=   0.5s
[CV 3/5; 1/36] START activation_function=softmax, dropout_rate=0.0, init=uniform
[CV 3/5; 1/36] END activation_function=softmax, dropout_rate=0.0, init=uniform;,
score=0.630 total time=   0.5s
[CV 4/5; 1/36] START activation_function=softmax, dropout_rate=0.0, init=uniform
[CV 4/5; 1/36] END activation_function=softmax, dropout_rate=0.0, init=uniform;,
score=0.745 total time=   0.5s
[CV 5/5; 1/36] START activation_function=softmax, dropout_rate=0.0, init=uniform
[CV 5/5; 1/36] END activation_function=softmax, dropout_rate=0.0, init=uniform;,
score=0.647 total time=   0.5s
[CV 1/5; 2/36] START activation_function=softmax, dropout_rate=0.0, init=normal.
[CV 1/5; 2/36] END activation_function=softmax, dropout_rate=0.0, init=normal;,
score=0.649 total time=   0.5s
[CV 2/5; 2/36] START activation_function=softmax, dropout_rate=0.0, init=normal.
[CV 2/5; 2/36] END activation_function=softmax, dropout_rate=0.0, init=normal;,
score=0.584 total time=   0.5s
[CV 3/5; 2/36] START activation_function=softmax, dropout_rate=0.0, init=normal.
[CV 3/5; 2/36] END activation_function=softmax, dropout_rate=0.0, init=normal;,
score=0.370 total time=   0.5s
[CV 4/5; 2/36] START activation_function=softmax, dropout_rate=0.0, init=normal.
[CV 4/5; 2/36] END activation_function=softmax, dropout_rate=0.0, init=normal;,
score=0.255 total time=   0.5s
[CV 5/5; 2/36] START activation_function=softmax, dropout_rate=0.0, init=normal.
[CV 5/5; 2/36] END activation_function=softmax, dropout_rate=0.0, init=normal;,
score=0.647 total time=   0.5s
[CV 1/5; 3/36] START activation_function=softmax, dropout_rate=0.0, init=zero…
[CV 1/5; 3/36] END activation_function=softmax, dropout_rate=0.0, init=zero;,
score=0.351 total time=   0.5s
[CV 2/5; 3/36] START activation_function=softmax, dropout_rate=0.0, init=zero…
[CV 2/5; 3/36] END activation_function=softmax, dropout_rate=0.0, init=zero;,
score=0.584 total time=   0.5s
[CV 3/5; 3/36] START activation_function=softmax, dropout_rate=0.0, init=zero…
[CV 3/5; 3/36] END activation_function=softmax, dropout_rate=0.0, init=zero;,
score=0.630 total time=   0.5s
[CV 4/5; 3/36] START activation_function=softmax, dropout_rate=0.0, init=zero…
[CV 4/5; 3/36] END activation_function=softmax, dropout_rate=0.0, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 3/36] START activation_function=softmax, dropout_rate=0.0, init=zero…
[CV 5/5; 3/36] END activation_function=softmax, dropout_rate=0.0, init=zero;,
score=0.647 total time=   0.5s
[CV 1/5; 4/36] START activation_function=softmax, dropout_rate=0.1, init=uniform
[CV 1/5; 4/36] END activation_function=softmax, dropout_rate=0.1, init=uniform;,
score=0.649 total time=   0.6s
[CV 2/5; 4/36] START activation_function=softmax, dropout_rate=0.1, init=uniform
[CV 2/5; 4/36] END activation_function=softmax, dropout_rate=0.1, init=uniform;,
score=0.584 total time=   0.6s
[CV 3/5; 4/36] START activation_function=softmax, dropout_rate=0.1, init=uniform
[CV 3/5; 4/36] END activation_function=softmax, dropout_rate=0.1, init=uniform;,
```

```
score=0.630 total time=   1.0s
[CV 4/5; 4/36] START activation_function=softmax, dropout_rate=0.1, init=uniform
[CV 4/5; 4/36] END activation_function=softmax, dropout_rate=0.1, init=uniform;,
score=0.255 total time=   0.6s
[CV 5/5; 4/36] START activation_function=softmax, dropout_rate=0.1, init=uniform
[CV 5/5; 4/36] END activation_function=softmax, dropout_rate=0.1, init=uniform;,
score=0.647 total time=   0.6s
[CV 1/5; 5/36] START activation_function=softmax, dropout_rate=0.1, init=normal.
[CV 1/5; 5/36] END activation_function=softmax, dropout_rate=0.1, init=normal;,
score=0.649 total time=   0.6s
[CV 2/5; 5/36] START activation_function=softmax, dropout_rate=0.1, init=normal.
[CV 2/5; 5/36] END activation_function=softmax, dropout_rate=0.1, init=normal;,
score=0.584 total time=   0.6s
[CV 3/5; 5/36] START activation_function=softmax, dropout_rate=0.1, init=normal.
[CV 3/5; 5/36] END activation_function=softmax, dropout_rate=0.1, init=normal;,
score=0.630 total time=   0.6s
[CV 4/5; 5/36] START activation_function=softmax, dropout_rate=0.1, init=normal.
[CV 4/5; 5/36] END activation_function=softmax, dropout_rate=0.1, init=normal;,
score=0.745 total time=   0.6s
[CV 5/5; 5/36] START activation_function=softmax, dropout_rate=0.1, init=normal.
[CV 5/5; 5/36] END activation_function=softmax, dropout_rate=0.1, init=normal;,
score=0.647 total time=   0.6s
[CV 1/5; 6/36] START activation_function=softmax, dropout_rate=0.1, init=zero…
[CV 1/5; 6/36] END activation_function=softmax, dropout_rate=0.1, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 6/36] START activation_function=softmax, dropout_rate=0.1, init=zero…
[CV 2/5; 6/36] END activation_function=softmax, dropout_rate=0.1, init=zero;,
score=0.416 total time=   0.6s
[CV 3/5; 6/36] START activation_function=softmax, dropout_rate=0.1, init=zero…
[CV 3/5; 6/36] END activation_function=softmax, dropout_rate=0.1, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 6/36] START activation_function=softmax, dropout_rate=0.1, init=zero…
[CV 4/5; 6/36] END activation_function=softmax, dropout_rate=0.1, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 6/36] START activation_function=softmax, dropout_rate=0.1, init=zero…
[CV 5/5; 6/36] END activation_function=softmax, dropout_rate=0.1, init=zero;,
score=0.647 total time=   0.6s
[CV 1/5; 7/36] START activation_function=softmax, dropout_rate=0.2, init=uniform
[CV 1/5; 7/36] END activation_function=softmax, dropout_rate=0.2, init=uniform;,
score=0.649 total time=   0.6s
[CV 2/5; 7/36] START activation_function=softmax, dropout_rate=0.2, init=uniform
[CV 2/5; 7/36] END activation_function=softmax, dropout_rate=0.2, init=uniform;,
score=0.584 total time=   0.6s
[CV 3/5; 7/36] START activation_function=softmax, dropout_rate=0.2, init=uniform
[CV 3/5; 7/36] END activation_function=softmax, dropout_rate=0.2, init=uniform;,
score=0.630 total time=   0.6s
[CV 4/5; 7/36] START activation_function=softmax, dropout_rate=0.2, init=uniform
[CV 4/5; 7/36] END activation_function=softmax, dropout_rate=0.2, init=uniform;,
```

```
score=0.745 total time=   0.6s
[CV 5/5; 7/36] START activation_function=softmax, dropout_rate=0.2, init=uniform
[CV 5/5; 7/36] END activation_function=softmax, dropout_rate=0.2, init=uniform;,
score=0.647 total time=   0.6s
[CV 1/5; 8/36] START activation_function=softmax, dropout_rate=0.2, init=normal.
[CV 1/5; 8/36] END activation_function=softmax, dropout_rate=0.2, init=normal;,
score=0.649 total time=   0.6s
[CV 2/5; 8/36] START activation_function=softmax, dropout_rate=0.2, init=normal.
[CV 2/5; 8/36] END activation_function=softmax, dropout_rate=0.2, init=normal;,
score=0.584 total time=   0.6s
[CV 3/5; 8/36] START activation_function=softmax, dropout_rate=0.2, init=normal.
[CV 3/5; 8/36] END activation_function=softmax, dropout_rate=0.2, init=normal;,
score=0.630 total time=   1.0s
[CV 4/5; 8/36] START activation_function=softmax, dropout_rate=0.2, init=normal.
[CV 4/5; 8/36] END activation_function=softmax, dropout_rate=0.2, init=normal;,
score=0.745 total time=   0.6s
[CV 5/5; 8/36] START activation_function=softmax, dropout_rate=0.2, init=normal.
[CV 5/5; 8/36] END activation_function=softmax, dropout_rate=0.2, init=normal;,
score=0.647 total time=   0.6s
[CV 1/5; 9/36] START activation_function=softmax, dropout_rate=0.2, init=zero…
[CV 1/5; 9/36] END activation_function=softmax, dropout_rate=0.2, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 9/36] START activation_function=softmax, dropout_rate=0.2, init=zero…
[CV 2/5; 9/36] END activation_function=softmax, dropout_rate=0.2, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 9/36] START activation_function=softmax, dropout_rate=0.2, init=zero…
[CV 3/5; 9/36] END activation_function=softmax, dropout_rate=0.2, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 9/36] START activation_function=softmax, dropout_rate=0.2, init=zero…
[CV 4/5; 9/36] END activation_function=softmax, dropout_rate=0.2, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 9/36] START activation_function=softmax, dropout_rate=0.2, init=zero…
[CV 5/5; 9/36] END activation_function=softmax, dropout_rate=0.2, init=zero;,
score=0.647 total time=   0.6s
[CV 1/5; 10/36] START activation_function=relu, dropout_rate=0.0, init=uniform..
[CV 1/5; 10/36] END activation_function=relu, dropout_rate=0.0, init=uniform;,
score=0.760 total time=   0.6s
[CV 2/5; 10/36] START activation_function=relu, dropout_rate=0.0, init=uniform..
[CV 2/5; 10/36] END activation_function=relu, dropout_rate=0.0, init=uniform;,
score=0.695 total time=   0.6s
[CV 3/5; 10/36] START activation_function=relu, dropout_rate=0.0, init=uniform..
[CV 3/5; 10/36] END activation_function=relu, dropout_rate=0.0, init=uniform;,
score=0.747 total time=   0.6s
[CV 4/5; 10/36] START activation_function=relu, dropout_rate=0.0, init=uniform..
[CV 4/5; 10/36] END activation_function=relu, dropout_rate=0.0, init=uniform;,
score=0.824 total time=   0.6s
[CV 5/5; 10/36] START activation_function=relu, dropout_rate=0.0, init=uniform..
[CV 5/5; 10/36] END activation_function=relu, dropout_rate=0.0, init=uniform;,
```

```
score=0.647 total time=   0.6s
[CV 1/5; 11/36] START activation_function=relu, dropout_rate=0.0, init=normal…
[CV 1/5; 11/36] END activation_function=relu, dropout_rate=0.0, init=normal;,
score=0.760 total time=   0.5s
[CV 2/5; 11/36] START activation_function=relu, dropout_rate=0.0, init=normal…
[CV 2/5; 11/36] END activation_function=relu, dropout_rate=0.0, init=normal;,
score=0.584 total time=   0.5s
[CV 3/5; 11/36] START activation_function=relu, dropout_rate=0.0, init=normal…
[CV 3/5; 11/36] END activation_function=relu, dropout_rate=0.0, init=normal;,
score=0.766 total time=   0.5s
[CV 4/5; 11/36] START activation_function=relu, dropout_rate=0.0, init=normal…
[CV 4/5; 11/36] END activation_function=relu, dropout_rate=0.0, init=normal;,
score=0.843 total time=   0.5s
[CV 5/5; 11/36] START activation_function=relu, dropout_rate=0.0, init=normal…
[CV 5/5; 11/36] END activation_function=relu, dropout_rate=0.0, init=normal;,
score=0.758 total time=   0.5s
[CV 1/5; 12/36] START activation_function=relu, dropout_rate=0.0, init=zero…
[CV 1/5; 12/36] END activation_function=relu, dropout_rate=0.0, init=zero;,
score=0.649 total time=   0.5s
[CV 2/5; 12/36] START activation_function=relu, dropout_rate=0.0, init=zero…
[CV 2/5; 12/36] END activation_function=relu, dropout_rate=0.0, init=zero;,
score=0.584 total time=   0.5s
[CV 3/5; 12/36] START activation_function=relu, dropout_rate=0.0, init=zero…
[CV 3/5; 12/36] END activation_function=relu, dropout_rate=0.0, init=zero;,
score=0.630 total time=   0.9s
[CV 4/5; 12/36] START activation_function=relu, dropout_rate=0.0, init=zero…
[CV 4/5; 12/36] END activation_function=relu, dropout_rate=0.0, init=zero;,
score=0.745 total time=   0.5s
[CV 5/5; 12/36] START activation_function=relu, dropout_rate=0.0, init=zero…
[CV 5/5; 12/36] END activation_function=relu, dropout_rate=0.0, init=zero;,
score=0.647 total time=   0.5s
[CV 1/5; 13/36] START activation_function=relu, dropout_rate=0.1, init=uniform..
[CV 1/5; 13/36] END activation_function=relu, dropout_rate=0.1, init=uniform;,
score=0.649 total time=   0.6s
[CV 2/5; 13/36] START activation_function=relu, dropout_rate=0.1, init=uniform..
[CV 2/5; 13/36] END activation_function=relu, dropout_rate=0.1, init=uniform;,
score=0.727 total time=   0.6s
[CV 3/5; 13/36] START activation_function=relu, dropout_rate=0.1, init=uniform..
[CV 3/5; 13/36] END activation_function=relu, dropout_rate=0.1, init=uniform;,
score=0.766 total time=   0.6s
[CV 4/5; 13/36] START activation_function=relu, dropout_rate=0.1, init=uniform..
[CV 4/5; 13/36] END activation_function=relu, dropout_rate=0.1, init=uniform;,
score=0.830 total time=   0.6s
[CV 5/5; 13/36] START activation_function=relu, dropout_rate=0.1, init=uniform..
[CV 5/5; 13/36] END activation_function=relu, dropout_rate=0.1, init=uniform;,
score=0.647 total time=   0.6s
[CV 1/5; 14/36] START activation_function=relu, dropout_rate=0.1, init=normal…
[CV 1/5; 14/36] END activation_function=relu, dropout_rate=0.1, init=normal;,
```

```
score=0.753 total time=   0.6s
[CV 2/5; 14/36] START activation_function=relu, dropout_rate=0.1, init=normal…
[CV 2/5; 14/36] END activation_function=relu, dropout_rate=0.1, init=normal;,
score=0.675 total time=   0.6s
[CV 3/5; 14/36] START activation_function=relu, dropout_rate=0.1, init=normal…
[CV 3/5; 14/36] END activation_function=relu, dropout_rate=0.1, init=normal;,
score=0.630 total time=   0.6s
[CV 4/5; 14/36] START activation_function=relu, dropout_rate=0.1, init=normal…
[CV 4/5; 14/36] END activation_function=relu, dropout_rate=0.1, init=normal;,
score=0.817 total time=   0.6s
[CV 5/5; 14/36] START activation_function=relu, dropout_rate=0.1, init=normal…
[CV 5/5; 14/36] END activation_function=relu, dropout_rate=0.1, init=normal;,
score=0.771 total time=   0.6s
[CV 1/5; 15/36] START activation_function=relu, dropout_rate=0.1, init=zero…
[CV 1/5; 15/36] END activation_function=relu, dropout_rate=0.1, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 15/36] START activation_function=relu, dropout_rate=0.1, init=zero…
[CV 2/5; 15/36] END activation_function=relu, dropout_rate=0.1, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 15/36] START activation_function=relu, dropout_rate=0.1, init=zero…
[CV 3/5; 15/36] END activation_function=relu, dropout_rate=0.1, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 15/36] START activation_function=relu, dropout_rate=0.1, init=zero…
[CV 4/5; 15/36] END activation_function=relu, dropout_rate=0.1, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 15/36] START activation_function=relu, dropout_rate=0.1, init=zero…
[CV 5/5; 15/36] END activation_function=relu, dropout_rate=0.1, init=zero;,
score=0.647 total time=   0.6s
[CV 1/5; 16/36] START activation_function=relu, dropout_rate=0.2, init=uniform..
[CV 1/5; 16/36] END activation_function=relu, dropout_rate=0.2, init=uniform;,
score=0.766 total time=   0.6s
[CV 2/5; 16/36] START activation_function=relu, dropout_rate=0.2, init=uniform..
[CV 2/5; 16/36] END activation_function=relu, dropout_rate=0.2, init=uniform;,
score=0.701 total time=   0.6s
[CV 3/5; 16/36] START activation_function=relu, dropout_rate=0.2, init=uniform..
[CV 3/5; 16/36] END activation_function=relu, dropout_rate=0.2, init=uniform;,
score=0.753 total time=   1.0s
[CV 4/5; 16/36] START activation_function=relu, dropout_rate=0.2, init=uniform..
[CV 4/5; 16/36] END activation_function=relu, dropout_rate=0.2, init=uniform;,
score=0.830 total time=   0.6s
[CV 5/5; 16/36] START activation_function=relu, dropout_rate=0.2, init=uniform..
[CV 5/5; 16/36] END activation_function=relu, dropout_rate=0.2, init=uniform;,
score=0.752 total time=   0.6s
[CV 1/5; 17/36] START activation_function=relu, dropout_rate=0.2, init=normal…
[CV 1/5; 17/36] END activation_function=relu, dropout_rate=0.2, init=normal;,
score=0.747 total time=   0.6s
[CV 2/5; 17/36] START activation_function=relu, dropout_rate=0.2, init=normal…
[CV 2/5; 17/36] END activation_function=relu, dropout_rate=0.2, init=normal;,
```

```
score=0.584 total time=   0.6s
[CV 3/5; 17/36] START activation_function=relu, dropout_rate=0.2, init=normal…
[CV 3/5; 17/36] END activation_function=relu, dropout_rate=0.2, init=normal;,
score=0.630 total time=   0.6s
[CV 4/5; 17/36] START activation_function=relu, dropout_rate=0.2, init=normal…
[CV 4/5; 17/36] END activation_function=relu, dropout_rate=0.2, init=normal;,
score=0.810 total time=   0.6s
[CV 5/5; 17/36] START activation_function=relu, dropout_rate=0.2, init=normal…
[CV 5/5; 17/36] END activation_function=relu, dropout_rate=0.2, init=normal;,
score=0.647 total time=   0.6s
[CV 1/5; 18/36] START activation_function=relu, dropout_rate=0.2, init=zero…
[CV 1/5; 18/36] END activation_function=relu, dropout_rate=0.2, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 18/36] START activation_function=relu, dropout_rate=0.2, init=zero…
[CV 2/5; 18/36] END activation_function=relu, dropout_rate=0.2, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 18/36] START activation_function=relu, dropout_rate=0.2, init=zero…
[CV 3/5; 18/36] END activation_function=relu, dropout_rate=0.2, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 18/36] START activation_function=relu, dropout_rate=0.2, init=zero…
[CV 4/5; 18/36] END activation_function=relu, dropout_rate=0.2, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 18/36] START activation_function=relu, dropout_rate=0.2, init=zero…
[CV 5/5; 18/36] END activation_function=relu, dropout_rate=0.2, init=zero;,
score=0.647 total time=   0.7s
[CV 1/5; 19/36] START activation_function=tanh, dropout_rate=0.0, init=uniform..
[CV 1/5; 19/36] END activation_function=tanh, dropout_rate=0.0, init=uniform;,
score=0.760 total time=   0.6s
[CV 2/5; 19/36] START activation_function=tanh, dropout_rate=0.0, init=uniform..
[CV 2/5; 19/36] END activation_function=tanh, dropout_rate=0.0, init=uniform;,
score=0.682 total time=   0.6s
[CV 3/5; 19/36] START activation_function=tanh, dropout_rate=0.0, init=uniform..
[CV 3/5; 19/36] END activation_function=tanh, dropout_rate=0.0, init=uniform;,
score=0.753 total time=   0.6s
[CV 4/5; 19/36] START activation_function=tanh, dropout_rate=0.0, init=uniform..
[CV 4/5; 19/36] END activation_function=tanh, dropout_rate=0.0, init=uniform;,
score=0.817 total time=   0.5s
[CV 5/5; 19/36] START activation_function=tanh, dropout_rate=0.0, init=uniform..
[CV 5/5; 19/36] END activation_function=tanh, dropout_rate=0.0, init=uniform;,
score=0.765 total time=   0.5s
[CV 1/5; 20/36] START activation_function=tanh, dropout_rate=0.0, init=normal…
[CV 1/5; 20/36] END activation_function=tanh, dropout_rate=0.0, init=normal;,
score=0.753 total time=   0.6s
[CV 2/5; 20/36] START activation_function=tanh, dropout_rate=0.0, init=normal…
[CV 2/5; 20/36] END activation_function=tanh, dropout_rate=0.0, init=normal;,
score=0.675 total time=   0.5s
[CV 3/5; 20/36] START activation_function=tanh, dropout_rate=0.0, init=normal…
[CV 3/5; 20/36] END activation_function=tanh, dropout_rate=0.0, init=normal;,
```

```
score=0.747 total time=   0.5s
[CV 4/5; 20/36] START activation_function=tanh, dropout_rate=0.0, init=normal…
[CV 4/5; 20/36] END activation_function=tanh, dropout_rate=0.0, init=normal;,
score=0.824 total time=   0.9s
[CV 5/5; 20/36] START activation_function=tanh, dropout_rate=0.0, init=normal…
[CV 5/5; 20/36] END activation_function=tanh, dropout_rate=0.0, init=normal;,
score=0.771 total time=   0.5s
[CV 1/5; 21/36] START activation_function=tanh, dropout_rate=0.0, init=zero…
[CV 1/5; 21/36] END activation_function=tanh, dropout_rate=0.0, init=zero;,
score=0.649 total time=   0.5s
[CV 2/5; 21/36] START activation_function=tanh, dropout_rate=0.0, init=zero…
[CV 2/5; 21/36] END activation_function=tanh, dropout_rate=0.0, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 21/36] START activation_function=tanh, dropout_rate=0.0, init=zero…
[CV 3/5; 21/36] END activation_function=tanh, dropout_rate=0.0, init=zero;,
score=0.630 total time=   0.5s
[CV 4/5; 21/36] START activation_function=tanh, dropout_rate=0.0, init=zero…
[CV 4/5; 21/36] END activation_function=tanh, dropout_rate=0.0, init=zero;,
score=0.745 total time=   0.5s
[CV 5/5; 21/36] START activation_function=tanh, dropout_rate=0.0, init=zero…
[CV 5/5; 21/36] END activation_function=tanh, dropout_rate=0.0, init=zero;,
score=0.647 total time=   0.5s
[CV 1/5; 22/36] START activation_function=tanh, dropout_rate=0.1, init=uniform..
[CV 1/5; 22/36] END activation_function=tanh, dropout_rate=0.1, init=uniform;,
score=0.753 total time=   0.6s
[CV 2/5; 22/36] START activation_function=tanh, dropout_rate=0.1, init=uniform..
[CV 2/5; 22/36] END activation_function=tanh, dropout_rate=0.1, init=uniform;,
score=0.708 total time=   0.6s
[CV 3/5; 22/36] START activation_function=tanh, dropout_rate=0.1, init=uniform..
[CV 3/5; 22/36] END activation_function=tanh, dropout_rate=0.1, init=uniform;,
score=0.740 total time=   0.6s
[CV 4/5; 22/36] START activation_function=tanh, dropout_rate=0.1, init=uniform..
[CV 4/5; 22/36] END activation_function=tanh, dropout_rate=0.1, init=uniform;,
score=0.810 total time=   0.6s
[CV 5/5; 22/36] START activation_function=tanh, dropout_rate=0.1, init=uniform..
[CV 5/5; 22/36] END activation_function=tanh, dropout_rate=0.1, init=uniform;,
score=0.758 total time=   0.6s
[CV 1/5; 23/36] START activation_function=tanh, dropout_rate=0.1, init=normal…
[CV 1/5; 23/36] END activation_function=tanh, dropout_rate=0.1, init=normal;,
score=0.760 total time=   0.6s
[CV 2/5; 23/36] START activation_function=tanh, dropout_rate=0.1, init=normal…
[CV 2/5; 23/36] END activation_function=tanh, dropout_rate=0.1, init=normal;,
score=0.682 total time=   0.6s
[CV 3/5; 23/36] START activation_function=tanh, dropout_rate=0.1, init=normal…
[CV 3/5; 23/36] END activation_function=tanh, dropout_rate=0.1, init=normal;,
score=0.760 total time=   0.6s
[CV 4/5; 23/36] START activation_function=tanh, dropout_rate=0.1, init=normal…
[CV 4/5; 23/36] END activation_function=tanh, dropout_rate=0.1, init=normal;,
```

```
score=0.817 total time=   0.6s
[CV 5/5; 23/36] START activation_function=tanh, dropout_rate=0.1, init=normal…
[CV 5/5; 23/36] END activation_function=tanh, dropout_rate=0.1, init=normal;,
score=0.758 total time=   0.6s
[CV 1/5; 24/36] START activation_function=tanh, dropout_rate=0.1, init=zero…
[CV 1/5; 24/36] END activation_function=tanh, dropout_rate=0.1, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 24/36] START activation_function=tanh, dropout_rate=0.1, init=zero…
[CV 2/5; 24/36] END activation_function=tanh, dropout_rate=0.1, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 24/36] START activation_function=tanh, dropout_rate=0.1, init=zero…
[CV 3/5; 24/36] END activation_function=tanh, dropout_rate=0.1, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 24/36] START activation_function=tanh, dropout_rate=0.1, init=zero…
[CV 4/5; 24/36] END activation_function=tanh, dropout_rate=0.1, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 24/36] START activation_function=tanh, dropout_rate=0.1, init=zero…
[CV 5/5; 24/36] END activation_function=tanh, dropout_rate=0.1, init=zero;,
score=0.647 total time=   1.0s
[CV 1/5; 25/36] START activation_function=tanh, dropout_rate=0.2, init=uniform..
[CV 1/5; 25/36] END activation_function=tanh, dropout_rate=0.2, init=uniform;,
score=0.753 total time=   0.6s
[CV 2/5; 25/36] START activation_function=tanh, dropout_rate=0.2, init=uniform..
[CV 2/5; 25/36] END activation_function=tanh, dropout_rate=0.2, init=uniform;,
score=0.708 total time=   0.6s
[CV 3/5; 25/36] START activation_function=tanh, dropout_rate=0.2, init=uniform..
[CV 3/5; 25/36] END activation_function=tanh, dropout_rate=0.2, init=uniform;,
score=0.734 total time=   0.6s
[CV 4/5; 25/36] START activation_function=tanh, dropout_rate=0.2, init=uniform..
[CV 4/5; 25/36] END activation_function=tanh, dropout_rate=0.2, init=uniform;,
score=0.830 total time=   0.6s
[CV 5/5; 25/36] START activation_function=tanh, dropout_rate=0.2, init=uniform..
[CV 5/5; 25/36] END activation_function=tanh, dropout_rate=0.2, init=uniform;,
score=0.765 total time=   0.6s
[CV 1/5; 26/36] START activation_function=tanh, dropout_rate=0.2, init=normal…
[CV 1/5; 26/36] END activation_function=tanh, dropout_rate=0.2, init=normal;,
score=0.760 total time=   0.7s
[CV 2/5; 26/36] START activation_function=tanh, dropout_rate=0.2, init=normal…
[CV 2/5; 26/36] END activation_function=tanh, dropout_rate=0.2, init=normal;,
score=0.701 total time=   0.6s
[CV 3/5; 26/36] START activation_function=tanh, dropout_rate=0.2, init=normal…
[CV 3/5; 26/36] END activation_function=tanh, dropout_rate=0.2, init=normal;,
score=0.734 total time=   0.6s
[CV 4/5; 26/36] START activation_function=tanh, dropout_rate=0.2, init=normal…
[CV 4/5; 26/36] END activation_function=tanh, dropout_rate=0.2, init=normal;,
score=0.837 total time=   0.6s
[CV 5/5; 26/36] START activation_function=tanh, dropout_rate=0.2, init=normal…
[CV 5/5; 26/36] END activation_function=tanh, dropout_rate=0.2, init=normal;,
```

```
score=0.771 total time=   0.7s
[CV 1/5; 27/36] START activation_function=tanh, dropout_rate=0.2, init=zero…
[CV 1/5; 27/36] END activation_function=tanh, dropout_rate=0.2, init=zero;,
score=0.649 total time=   0.7s
[CV 2/5; 27/36] START activation_function=tanh, dropout_rate=0.2, init=zero…
[CV 2/5; 27/36] END activation_function=tanh, dropout_rate=0.2, init=zero;,
score=0.584 total time=   0.7s
[CV 3/5; 27/36] START activation_function=tanh, dropout_rate=0.2, init=zero…
[CV 3/5; 27/36] END activation_function=tanh, dropout_rate=0.2, init=zero;,
score=0.630 total time=   0.6s
[CV 4/5; 27/36] START activation_function=tanh, dropout_rate=0.2, init=zero…
[CV 4/5; 27/36] END activation_function=tanh, dropout_rate=0.2, init=zero;,
score=0.745 total time=   0.5s
[CV 5/5; 27/36] START activation_function=tanh, dropout_rate=0.2, init=zero…
[CV 5/5; 27/36] END activation_function=tanh, dropout_rate=0.2, init=zero;,
score=0.647 total time=   0.5s
[CV 1/5; 28/36] START activation_function=linear, dropout_rate=0.0, init=uniform
[CV 1/5; 28/36] END activation_function=linear, dropout_rate=0.0, init=uniform;,
score=0.747 total time=   0.5s
[CV 2/5; 28/36] START activation_function=linear, dropout_rate=0.0, init=uniform
[CV 2/5; 28/36] END activation_function=linear, dropout_rate=0.0, init=uniform;,
score=0.695 total time=   0.5s
[CV 3/5; 28/36] START activation_function=linear, dropout_rate=0.0, init=uniform
[CV 3/5; 28/36] END activation_function=linear, dropout_rate=0.0, init=uniform;,
score=0.753 total time=   0.5s
[CV 4/5; 28/36] START activation_function=linear, dropout_rate=0.0, init=uniform
[CV 4/5; 28/36] END activation_function=linear, dropout_rate=0.0, init=uniform;,
score=0.810 total time=   0.6s
[CV 5/5; 28/36] START activation_function=linear, dropout_rate=0.0, init=uniform
[CV 5/5; 28/36] END activation_function=linear, dropout_rate=0.0, init=uniform;,
score=0.758 total time=   0.6s
[CV 1/5; 29/36] START activation_function=linear, dropout_rate=0.0, init=normal.
[CV 1/5; 29/36] END activation_function=linear, dropout_rate=0.0, init=normal;,
score=0.747 total time=   0.6s
[CV 2/5; 29/36] START activation_function=linear, dropout_rate=0.0, init=normal.
[CV 2/5; 29/36] END activation_function=linear, dropout_rate=0.0, init=normal;,
score=0.675 total time=   1.1s
[CV 3/5; 29/36] START activation_function=linear, dropout_rate=0.0, init=normal.
[CV 3/5; 29/36] END activation_function=linear, dropout_rate=0.0, init=normal;,
score=0.740 total time=   0.5s
[CV 4/5; 29/36] START activation_function=linear, dropout_rate=0.0, init=normal.
[CV 4/5; 29/36] END activation_function=linear, dropout_rate=0.0, init=normal;,
score=0.837 total time=   0.5s
[CV 5/5; 29/36] START activation_function=linear, dropout_rate=0.0, init=normal.
[CV 5/5; 29/36] END activation_function=linear, dropout_rate=0.0, init=normal;,
score=0.758 total time=   0.5s
[CV 1/5; 30/36] START activation_function=linear, dropout_rate=0.0, init=zero…
[CV 1/5; 30/36] END activation_function=linear, dropout_rate=0.0, init=zero;,
```

```
score=0.649 total time=   0.6s
[CV 2/5; 30/36] START activation_function=linear, dropout_rate=0.0, init=zero…
[CV 2/5; 30/36] END activation_function=linear, dropout_rate=0.0, init=zero;,
score=0.584 total time=   0.6s
[CV 3/5; 30/36] START activation_function=linear, dropout_rate=0.0, init=zero…
[CV 3/5; 30/36] END activation_function=linear, dropout_rate=0.0, init=zero;,
score=0.630 total time=   0.5s
[CV 4/5; 30/36] START activation_function=linear, dropout_rate=0.0, init=zero…
[CV 4/5; 30/36] END activation_function=linear, dropout_rate=0.0, init=zero;,
score=0.745 total time=   0.5s
[CV 5/5; 30/36] START activation_function=linear, dropout_rate=0.0, init=zero…
[CV 5/5; 30/36] END activation_function=linear, dropout_rate=0.0, init=zero;,
score=0.647 total time=   0.6s
[CV 1/5; 31/36] START activation_function=linear, dropout_rate=0.1, init=uniform
[CV 1/5; 31/36] END activation_function=linear, dropout_rate=0.1, init=uniform;,
score=0.740 total time=   0.6s
[CV 2/5; 31/36] START activation_function=linear, dropout_rate=0.1, init=uniform
[CV 2/5; 31/36] END activation_function=linear, dropout_rate=0.1, init=uniform;,
score=0.675 total time=   0.6s
[CV 3/5; 31/36] START activation_function=linear, dropout_rate=0.1, init=uniform
[CV 3/5; 31/36] END activation_function=linear, dropout_rate=0.1, init=uniform;,
score=0.753 total time=   0.6s
[CV 4/5; 31/36] START activation_function=linear, dropout_rate=0.1, init=uniform
[CV 4/5; 31/36] END activation_function=linear, dropout_rate=0.1, init=uniform;,
score=0.817 total time=   0.6s
[CV 5/5; 31/36] START activation_function=linear, dropout_rate=0.1, init=uniform
[CV 5/5; 31/36] END activation_function=linear, dropout_rate=0.1, init=uniform;,
score=0.771 total time=   0.6s
[CV 1/5; 32/36] START activation_function=linear, dropout_rate=0.1, init=normal.
[CV 1/5; 32/36] END activation_function=linear, dropout_rate=0.1, init=normal;,
score=0.747 total time=   0.6s
[CV 2/5; 32/36] START activation_function=linear, dropout_rate=0.1, init=normal.
[CV 2/5; 32/36] END activation_function=linear, dropout_rate=0.1, init=normal;,
score=0.682 total time=   0.6s
[CV 3/5; 32/36] START activation_function=linear, dropout_rate=0.1, init=normal.
[CV 3/5; 32/36] END activation_function=linear, dropout_rate=0.1, init=normal;,
score=0.773 total time=   0.6s
[CV 4/5; 32/36] START activation_function=linear, dropout_rate=0.1, init=normal.
[CV 4/5; 32/36] END activation_function=linear, dropout_rate=0.1, init=normal;,
score=0.817 total time=   0.6s
[CV 5/5; 32/36] START activation_function=linear, dropout_rate=0.1, init=normal.
[CV 5/5; 32/36] END activation_function=linear, dropout_rate=0.1, init=normal;,
score=0.765 total time=   0.6s
[CV 1/5; 33/36] START activation_function=linear, dropout_rate=0.1, init=zero…
[CV 1/5; 33/36] END activation_function=linear, dropout_rate=0.1, init=zero;,
score=0.649 total time=   0.6s
[CV 2/5; 33/36] START activation_function=linear, dropout_rate=0.1, init=zero…
[CV 2/5; 33/36] END activation_function=linear, dropout_rate=0.1, init=zero;,
```

```
score=0.584 total time=   0.6s
[CV 3/5; 33/36] START activation_function=linear, dropout_rate=0.1, init=zero…
[CV 3/5; 33/36] END activation_function=linear, dropout_rate=0.1, init=zero;,
score=0.630 total time=   1.1s
[CV 4/5; 33/36] START activation_function=linear, dropout_rate=0.1, init=zero…
[CV 4/5; 33/36] END activation_function=linear, dropout_rate=0.1, init=zero;,
score=0.745 total time=   0.6s
[CV 5/5; 33/36] START activation_function=linear, dropout_rate=0.1, init=zero…
[CV 5/5; 33/36] END activation_function=linear, dropout_rate=0.1, init=zero;,
score=0.647 total time=   0.6s
[CV 1/5; 34/36] START activation_function=linear, dropout_rate=0.2, init=uniform
[CV 1/5; 34/36] END activation_function=linear, dropout_rate=0.2, init=uniform;,
score=0.753 total time=   0.6s
[CV 2/5; 34/36] START activation_function=linear, dropout_rate=0.2, init=uniform
[CV 2/5; 34/36] END activation_function=linear, dropout_rate=0.2, init=uniform;,
score=0.682 total time=   0.6s
[CV 3/5; 34/36] START activation_function=linear, dropout_rate=0.2, init=uniform
[CV 3/5; 34/36] END activation_function=linear, dropout_rate=0.2, init=uniform;,
score=0.734 total time=   0.6s
[CV 4/5; 34/36] START activation_function=linear, dropout_rate=0.2, init=uniform
[CV 4/5; 34/36] END activation_function=linear, dropout_rate=0.2, init=uniform;,
score=0.824 total time=   0.6s
[CV 5/5; 34/36] START activation_function=linear, dropout_rate=0.2, init=uniform
[CV 5/5; 34/36] END activation_function=linear, dropout_rate=0.2, init=uniform;,
score=0.771 total time=   0.6s
[CV 1/5; 35/36] START activation_function=linear, dropout_rate=0.2, init=normal.
[CV 1/5; 35/36] END activation_function=linear, dropout_rate=0.2, init=normal;,
score=0.747 total time=   0.6s
[CV 2/5; 35/36] START activation_function=linear, dropout_rate=0.2, init=normal.
[CV 2/5; 35/36] END activation_function=linear, dropout_rate=0.2, init=normal;,
score=0.682 total time=   0.6s
[CV 3/5; 35/36] START activation_function=linear, dropout_rate=0.2, init=normal.
[CV 3/5; 35/36] END activation_function=linear, dropout_rate=0.2, init=normal;,
score=0.740 total time=   0.6s
[CV 4/5; 35/36] START activation_function=linear, dropout_rate=0.2, init=normal.
[CV 4/5; 35/36] END activation_function=linear, dropout_rate=0.2, init=normal;,
score=0.830 total time=   0.6s
[CV 5/5; 35/36] START activation_function=linear, dropout_rate=0.2, init=normal.
[CV 5/5; 35/36] END activation_function=linear, dropout_rate=0.2, init=normal;,
score=0.765 total time=   0.6s
[CV 1/5; 36/36] START activation_function=linear, dropout_rate=0.2, init=zero…
[CV 1/5; 36/36] END activation_function=linear, dropout_rate=0.2, init=zero;,
score=0.649 total time=   0.5s
[CV 2/5; 36/36] START activation_function=linear, dropout_rate=0.2, init=zero…
[CV 2/5; 36/36] END activation_function=linear, dropout_rate=0.2, init=zero;,
score=0.584 total time=   0.5s
[CV 3/5; 36/36] START activation_function=linear, dropout_rate=0.2, init=zero…
[CV 3/5; 36/36] END activation_function=linear, dropout_rate=0.2, init=zero;,
```

```
score=0.630 total time=   0.6s
[CV 4/5; 36/36] START activation_function=linear, dropout_rate=0.2, init=zero…
[CV 4/5; 36/36] END activation_function=linear, dropout_rate=0.2, init=zero;,
score=0.745 total time=   0.5s
[CV 5/5; 36/36] START activation_function=linear, dropout_rate=0.2, init=zero…
[CV 5/5; 36/36] END activation_function=linear, dropout_rate=0.2, init=zero;,
score=0.647 total time=   0.5s
```

[15]:
```
# Summarize the results
print('Best : {}, using {}'.format(grid_result.best_score_,grid_result.
 ↪best_params_))
means = grid_result.cv_results_['mean_test_score']
stds = grid_result.cv_results_['std_test_score']
params = grid_result.cv_results_['params']
for mean, stdev, param in zip(means, stds, params):
  print('{},{} with: {}'.format(mean, stdev, param))
```

```
Best : 0.7605296730995178, using {'activation_function': 'tanh', 'dropout_rate':
0.2, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'softmax',
'dropout_rate': 0.0, 'init': 'uniform'}
0.5011713802814484,0.15999395771379943 with: {'activation_function': 'softmax',
'dropout_rate': 0.0, 'init': 'normal'}
0.5914183855056763,0.1313092546244197 with: {'activation_function': 'softmax',
'dropout_rate': 0.0, 'init': 'zero'}
0.5531194269657135,0.15092304368625437 with: {'activation_function': 'softmax',
'dropout_rate': 0.1, 'init': 'uniform'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'softmax',
'dropout_rate': 0.1, 'init': 'normal'}
0.6173924148082733,0.10871275688841411 with: {'activation_function': 'softmax',
'dropout_rate': 0.1, 'init': 'zero'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'softmax',
'dropout_rate': 0.2, 'init': 'uniform'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'softmax',
'dropout_rate': 0.2, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'softmax',
'dropout_rate': 0.2, 'init': 'zero'}
0.7343773961067199,0.059891581108994126 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'init': 'uniform'}
0.7423393487930298,0.08511696086592174 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.0, 'init': 'zero'}
0.7239962697029114,0.07005245221332643 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'init': 'uniform'}
0.729335367679596,0.06756084694416326 with: {'activation_function': 'relu',
'dropout_rate': 0.1, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
```

```
'dropout_rate': 0.1, 'init': 'zero'}
0.7604957103729248,0.04125099898706969 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'init': 'uniform'}
0.6837110638618469,0.08263270219960513 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'relu',
'dropout_rate': 0.2, 'init': 'zero'}
0.7553009033203125,0.04316958224239693 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'init': 'uniform'}
0.7540191888809205,0.04769592972789157 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.0, 'init': 'zero'}
0.7539852380752563,0.03325465366615576 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'init': 'uniform'}
0.7552924156188965,0.043019366162887096 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.1, 'init': 'zero'}
0.7579152941703796,0.04091219739536057 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'init': 'uniform'}
0.7605296730995178,0.04500412372803133 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'tanh',
'dropout_rate': 0.2, 'init': 'zero'}
0.7526865363121032,0.03675138413657233 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'init': 'uniform'}
0.7514217972755433,0.051455311960179 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.0, 'init': 'zero'}
0.7514132976531982,0.04606771446568663 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'init': 'uniform'}
0.7565996170043945,0.04396007985722057 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.1, 'init': 'zero'}
0.7527204871177673,0.046354334886098164 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'init': 'uniform'}
0.7527204990386963,0.04763169991247935 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'init': 'normal'}
0.6511586427688598,0.05244526932680711 with: {'activation_function': 'linear',
'dropout_rate': 0.2, 'init': 'zero'}
```

Tuning of Hyperparameter :-Number of Neurons in activation layer

[17]:
```
from keras.layers import Dropout
from keras.optimizers import Adam
```

```
from keras.models import Sequential
from keras.wrappers.scikit_learn import KerasClassifier
from sklearn.model_selection import GridSearchCV, KFold

# Defining the model
def create_model(neuron1, neuron2, dropout_rate=0.1):
    model = Sequential()
    model.add(Dense(neuron1, input_dim=8, kernel_initializer='uniform',␣
 ↪activation='tanh'))
    model.add(Dropout(dropout_rate))
    model.add(Dense(neuron2, input_dim=neuron1, kernel_initializer='uniform',␣
 ↪activation='tanh'))
    model.add(Dropout(dropout_rate))
    model.add(Dense(1, activation='sigmoid'))

    adam = Adam(lr=0.001)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
    return model

# Create the model
model = KerasClassifier(build_fn=create_model, verbose=0, batch_size=40,␣
 ↪epochs=10)

# Define the grid search parameters
neuron1 = [4, 8, 16]
neuron2 = [2, 4, 8]
dropout_rate = [0.0, 0.1, 0.2]  # Add dropout rate parameter

# Make a dictionary of the grid search parameters
param_grids = dict(neuron1=neuron1, neuron2=neuron2, dropout_rate=dropout_rate)

# Build and fit the GridSearchCV
grid = GridSearchCV(estimator=model, param_grid=param_grids, cv=KFold(),␣
 ↪verbose=10)
grid_result = grid.fit(X_standardized, y)
```

```
Fitting 5 folds for each of 27 candidates, totalling 135 fits
[CV 1/5; 1/27] START dropout_rate=0.0, neuron1=4, neuron2=2…
[CV 1/5; 1/27] END dropout_rate=0.0, neuron1=4, neuron2=2;, score=0.747 total
time=   0.5s
[CV 2/5; 1/27] START dropout_rate=0.0, neuron1=4, neuron2=2…
[CV 2/5; 1/27] END dropout_rate=0.0, neuron1=4, neuron2=2;, score=0.688 total
time=   0.5s
[CV 3/5; 1/27] START dropout_rate=0.0, neuron1=4, neuron2=2…
[CV 3/5; 1/27] END dropout_rate=0.0, neuron1=4, neuron2=2;, score=0.708 total
time=   1.0s
```

```
[CV 4/5; 1/27] START dropout_rate=0.0, neuron1=4, neuron2=2…
[CV 4/5; 1/27] END dropout_rate=0.0, neuron1=4, neuron2=2;, score=0.804 total
time=   0.5s
[CV 5/5; 1/27] START dropout_rate=0.0, neuron1=4, neuron2=2…
[CV 5/5; 1/27] END dropout_rate=0.0, neuron1=4, neuron2=2;, score=0.732 total
time=   0.5s
[CV 1/5; 2/27] START dropout_rate=0.0, neuron1=4, neuron2=4…
[CV 1/5; 2/27] END dropout_rate=0.0, neuron1=4, neuron2=4;, score=0.773 total
time=   0.5s
[CV 2/5; 2/27] START dropout_rate=0.0, neuron1=4, neuron2=4…
[CV 2/5; 2/27] END dropout_rate=0.0, neuron1=4, neuron2=4;, score=0.675 total
time=   0.5s
[CV 3/5; 2/27] START dropout_rate=0.0, neuron1=4, neuron2=4…
[CV 3/5; 2/27] END dropout_rate=0.0, neuron1=4, neuron2=4;, score=0.721 total
time=   0.5s
[CV 4/5; 2/27] START dropout_rate=0.0, neuron1=4, neuron2=4…
[CV 4/5; 2/27] END dropout_rate=0.0, neuron1=4, neuron2=4;, score=0.791 total
time=   0.5s
[CV 5/5; 2/27] START dropout_rate=0.0, neuron1=4, neuron2=4…
[CV 5/5; 2/27] END dropout_rate=0.0, neuron1=4, neuron2=4;, score=0.758 total
time=   0.5s
[CV 1/5; 3/27] START dropout_rate=0.0, neuron1=4, neuron2=8…
[CV 1/5; 3/27] END dropout_rate=0.0, neuron1=4, neuron2=8;, score=0.760 total
time=   0.5s
[CV 2/5; 3/27] START dropout_rate=0.0, neuron1=4, neuron2=8…
[CV 2/5; 3/27] END dropout_rate=0.0, neuron1=4, neuron2=8;, score=0.695 total
time=   0.5s
[CV 3/5; 3/27] START dropout_rate=0.0, neuron1=4, neuron2=8…
[CV 3/5; 3/27] END dropout_rate=0.0, neuron1=4, neuron2=8;, score=0.753 total
time=   0.6s
[CV 4/5; 3/27] START dropout_rate=0.0, neuron1=4, neuron2=8…
[CV 4/5; 3/27] END dropout_rate=0.0, neuron1=4, neuron2=8;, score=0.817 total
time=   0.6s
[CV 5/5; 3/27] START dropout_rate=0.0, neuron1=4, neuron2=8…
[CV 5/5; 3/27] END dropout_rate=0.0, neuron1=4, neuron2=8;, score=0.752 total
time=   0.6s
[CV 1/5; 4/27] START dropout_rate=0.0, neuron1=8, neuron2=2…
[CV 1/5; 4/27] END dropout_rate=0.0, neuron1=8, neuron2=2;, score=0.753 total
time=   0.6s
[CV 2/5; 4/27] START dropout_rate=0.0, neuron1=8, neuron2=2…
[CV 2/5; 4/27] END dropout_rate=0.0, neuron1=8, neuron2=2;, score=0.675 total
time=   0.6s
[CV 3/5; 4/27] START dropout_rate=0.0, neuron1=8, neuron2=2…
[CV 3/5; 4/27] END dropout_rate=0.0, neuron1=8, neuron2=2;, score=0.727 total
time=   0.5s
[CV 4/5; 4/27] START dropout_rate=0.0, neuron1=8, neuron2=2…
[CV 4/5; 4/27] END dropout_rate=0.0, neuron1=8, neuron2=2;, score=0.817 total
time=   0.6s
```

```
[CV 5/5; 4/27] START dropout_rate=0.0, neuron1=8, neuron2=2…
[CV 5/5; 4/27] END dropout_rate=0.0, neuron1=8, neuron2=2;, score=0.765 total
time=   0.6s
[CV 1/5; 5/27] START dropout_rate=0.0, neuron1=8, neuron2=4…
[CV 1/5; 5/27] END dropout_rate=0.0, neuron1=8, neuron2=4;, score=0.753 total
time=   0.6s
[CV 2/5; 5/27] START dropout_rate=0.0, neuron1=8, neuron2=4…
[CV 2/5; 5/27] END dropout_rate=0.0, neuron1=8, neuron2=4;, score=0.682 total
time=   0.5s
[CV 3/5; 5/27] START dropout_rate=0.0, neuron1=8, neuron2=4…
[CV 3/5; 5/27] END dropout_rate=0.0, neuron1=8, neuron2=4;, score=0.760 total
time=   0.5s
[CV 4/5; 5/27] START dropout_rate=0.0, neuron1=8, neuron2=4…
[CV 4/5; 5/27] END dropout_rate=0.0, neuron1=8, neuron2=4;, score=0.817 total
time=   0.5s
[CV 5/5; 5/27] START dropout_rate=0.0, neuron1=8, neuron2=4…
[CV 5/5; 5/27] END dropout_rate=0.0, neuron1=8, neuron2=4;, score=0.765 total
time=   0.9s
[CV 1/5; 6/27] START dropout_rate=0.0, neuron1=8, neuron2=8…
[CV 1/5; 6/27] END dropout_rate=0.0, neuron1=8, neuron2=8;, score=0.766 total
time=   0.5s
[CV 2/5; 6/27] START dropout_rate=0.0, neuron1=8, neuron2=8…
[CV 2/5; 6/27] END dropout_rate=0.0, neuron1=8, neuron2=8;, score=0.708 total
time=   0.5s
[CV 3/5; 6/27] START dropout_rate=0.0, neuron1=8, neuron2=8…
[CV 3/5; 6/27] END dropout_rate=0.0, neuron1=8, neuron2=8;, score=0.766 total
time=   0.6s
[CV 4/5; 6/27] START dropout_rate=0.0, neuron1=8, neuron2=8…
[CV 4/5; 6/27] END dropout_rate=0.0, neuron1=8, neuron2=8;, score=0.817 total
time=   0.6s
[CV 5/5; 6/27] START dropout_rate=0.0, neuron1=8, neuron2=8…
[CV 5/5; 6/27] END dropout_rate=0.0, neuron1=8, neuron2=8;, score=0.771 total
time=   0.6s
[CV 1/5; 7/27] START dropout_rate=0.0, neuron1=16, neuron2=2…
[CV 1/5; 7/27] END dropout_rate=0.0, neuron1=16, neuron2=2;, score=0.773 total
time=   0.6s
[CV 2/5; 7/27] START dropout_rate=0.0, neuron1=16, neuron2=2…
[CV 2/5; 7/27] END dropout_rate=0.0, neuron1=16, neuron2=2;, score=0.708 total
time=   0.6s
[CV 3/5; 7/27] START dropout_rate=0.0, neuron1=16, neuron2=2…
[CV 3/5; 7/27] END dropout_rate=0.0, neuron1=16, neuron2=2;, score=0.753 total
time=   0.6s
[CV 4/5; 7/27] START dropout_rate=0.0, neuron1=16, neuron2=2…
[CV 4/5; 7/27] END dropout_rate=0.0, neuron1=16, neuron2=2;, score=0.837 total
time=   0.6s
[CV 5/5; 7/27] START dropout_rate=0.0, neuron1=16, neuron2=2…
[CV 5/5; 7/27] END dropout_rate=0.0, neuron1=16, neuron2=2;, score=0.778 total
time=   0.5s
```

```
[CV 1/5; 8/27] START dropout_rate=0.0, neuron1=16, neuron2=4…
[CV 1/5; 8/27] END dropout_rate=0.0, neuron1=16, neuron2=4;, score=0.773 total
time=   0.5s
[CV 2/5; 8/27] START dropout_rate=0.0, neuron1=16, neuron2=4…
[CV 2/5; 8/27] END dropout_rate=0.0, neuron1=16, neuron2=4;, score=0.721 total
time=   0.5s
[CV 3/5; 8/27] START dropout_rate=0.0, neuron1=16, neuron2=4…
[CV 3/5; 8/27] END dropout_rate=0.0, neuron1=16, neuron2=4;, score=0.753 total
time=   0.6s
[CV 4/5; 8/27] START dropout_rate=0.0, neuron1=16, neuron2=4…
[CV 4/5; 8/27] END dropout_rate=0.0, neuron1=16, neuron2=4;, score=0.843 total
time=   0.6s
[CV 5/5; 8/27] START dropout_rate=0.0, neuron1=16, neuron2=4…
[CV 5/5; 8/27] END dropout_rate=0.0, neuron1=16, neuron2=4;, score=0.758 total
time=   0.6s
[CV 1/5; 9/27] START dropout_rate=0.0, neuron1=16, neuron2=8…
[CV 1/5; 9/27] END dropout_rate=0.0, neuron1=16, neuron2=8;, score=0.773 total
time=   0.5s
[CV 2/5; 9/27] START dropout_rate=0.0, neuron1=16, neuron2=8…
[CV 2/5; 9/27] END dropout_rate=0.0, neuron1=16, neuron2=8;, score=0.721 total
time=   0.5s
[CV 3/5; 9/27] START dropout_rate=0.0, neuron1=16, neuron2=8…
[CV 3/5; 9/27] END dropout_rate=0.0, neuron1=16, neuron2=8;, score=0.760 total
time=   0.5s
[CV 4/5; 9/27] START dropout_rate=0.0, neuron1=16, neuron2=8…
[CV 4/5; 9/27] END dropout_rate=0.0, neuron1=16, neuron2=8;, score=0.830 total
time=   0.5s
[CV 5/5; 9/27] START dropout_rate=0.0, neuron1=16, neuron2=8…
[CV 5/5; 9/27] END dropout_rate=0.0, neuron1=16, neuron2=8;, score=0.758 total
time=   0.6s
[CV 1/5; 10/27] START dropout_rate=0.1, neuron1=4, neuron2=2…
[CV 1/5; 10/27] END dropout_rate=0.1, neuron1=4, neuron2=2;, score=0.766 total
time=   0.6s
[CV 2/5; 10/27] START dropout_rate=0.1, neuron1=4, neuron2=2…
[CV 2/5; 10/27] END dropout_rate=0.1, neuron1=4, neuron2=2;, score=0.701 total
time=   1.1s
[CV 3/5; 10/27] START dropout_rate=0.1, neuron1=4, neuron2=2…
[CV 3/5; 10/27] END dropout_rate=0.1, neuron1=4, neuron2=2;, score=0.721 total
time=   0.6s
[CV 4/5; 10/27] START dropout_rate=0.1, neuron1=4, neuron2=2…
[CV 4/5; 10/27] END dropout_rate=0.1, neuron1=4, neuron2=2;, score=0.791 total
time=   0.6s
[CV 5/5; 10/27] START dropout_rate=0.1, neuron1=4, neuron2=2…
[CV 5/5; 10/27] END dropout_rate=0.1, neuron1=4, neuron2=2;, score=0.732 total
time=   0.6s
[CV 1/5; 11/27] START dropout_rate=0.1, neuron1=4, neuron2=4…
[CV 1/5; 11/27] END dropout_rate=0.1, neuron1=4, neuron2=4;, score=0.766 total
time=   0.6s
```

```
[CV 2/5; 11/27] START dropout_rate=0.1, neuron1=4, neuron2=4…
[CV 2/5; 11/27] END dropout_rate=0.1, neuron1=4, neuron2=4;, score=0.682 total
time=   0.7s
[CV 3/5; 11/27] START dropout_rate=0.1, neuron1=4, neuron2=4…
[CV 3/5; 11/27] END dropout_rate=0.1, neuron1=4, neuron2=4;, score=0.734 total
time=   0.6s
[CV 4/5; 11/27] START dropout_rate=0.1, neuron1=4, neuron2=4…
[CV 4/5; 11/27] END dropout_rate=0.1, neuron1=4, neuron2=4;, score=0.791 total
time=   0.6s
[CV 5/5; 11/27] START dropout_rate=0.1, neuron1=4, neuron2=4…
[CV 5/5; 11/27] END dropout_rate=0.1, neuron1=4, neuron2=4;, score=0.758 total
time=   0.6s
[CV 1/5; 12/27] START dropout_rate=0.1, neuron1=4, neuron2=8…
[CV 1/5; 12/27] END dropout_rate=0.1, neuron1=4, neuron2=8;, score=0.760 total
time=   0.5s
[CV 2/5; 12/27] START dropout_rate=0.1, neuron1=4, neuron2=8…
[CV 2/5; 12/27] END dropout_rate=0.1, neuron1=4, neuron2=8;, score=0.669 total
time=   0.6s
[CV 3/5; 12/27] START dropout_rate=0.1, neuron1=4, neuron2=8…
[CV 3/5; 12/27] END dropout_rate=0.1, neuron1=4, neuron2=8;, score=0.747 total
time=   0.7s
[CV 4/5; 12/27] START dropout_rate=0.1, neuron1=4, neuron2=8…
[CV 4/5; 12/27] END dropout_rate=0.1, neuron1=4, neuron2=8;, score=0.824 total
time=   0.6s
[CV 5/5; 12/27] START dropout_rate=0.1, neuron1=4, neuron2=8…
[CV 5/5; 12/27] END dropout_rate=0.1, neuron1=4, neuron2=8;, score=0.765 total
time=   0.6s
[CV 1/5; 13/27] START dropout_rate=0.1, neuron1=8, neuron2=2…
[CV 1/5; 13/27] END dropout_rate=0.1, neuron1=8, neuron2=2;, score=0.753 total
time=   0.6s
[CV 2/5; 13/27] START dropout_rate=0.1, neuron1=8, neuron2=2…
[CV 2/5; 13/27] END dropout_rate=0.1, neuron1=8, neuron2=2;, score=0.701 total
time=   0.6s
[CV 3/5; 13/27] START dropout_rate=0.1, neuron1=8, neuron2=2…
[CV 3/5; 13/27] END dropout_rate=0.1, neuron1=8, neuron2=2;, score=0.734 total
time=   0.6s
[CV 4/5; 13/27] START dropout_rate=0.1, neuron1=8, neuron2=2…
[CV 4/5; 13/27] END dropout_rate=0.1, neuron1=8, neuron2=2;, score=0.791 total
time=   0.6s
[CV 5/5; 13/27] START dropout_rate=0.1, neuron1=8, neuron2=2…
[CV 5/5; 13/27] END dropout_rate=0.1, neuron1=8, neuron2=2;, score=0.758 total
time=   0.6s
[CV 1/5; 14/27] START dropout_rate=0.1, neuron1=8, neuron2=4…
[CV 1/5; 14/27] END dropout_rate=0.1, neuron1=8, neuron2=4;, score=0.747 total
time=   0.6s
[CV 2/5; 14/27] START dropout_rate=0.1, neuron1=8, neuron2=4…
[CV 2/5; 14/27] END dropout_rate=0.1, neuron1=8, neuron2=4;, score=0.682 total
time=   0.6s
```

```
[CV 3/5; 14/27] START dropout_rate=0.1, neuron1=8, neuron2=4…
[CV 3/5; 14/27] END dropout_rate=0.1, neuron1=8, neuron2=4;, score=0.766 total
time=   1.0s
[CV 4/5; 14/27] START dropout_rate=0.1, neuron1=8, neuron2=4…
[CV 4/5; 14/27] END dropout_rate=0.1, neuron1=8, neuron2=4;, score=0.810 total
time=   0.6s
[CV 5/5; 14/27] START dropout_rate=0.1, neuron1=8, neuron2=4…
[CV 5/5; 14/27] END dropout_rate=0.1, neuron1=8, neuron2=4;, score=0.765 total
time=   0.6s
[CV 1/5; 15/27] START dropout_rate=0.1, neuron1=8, neuron2=8…
[CV 1/5; 15/27] END dropout_rate=0.1, neuron1=8, neuron2=8;, score=0.760 total
time=   0.5s
[CV 2/5; 15/27] START dropout_rate=0.1, neuron1=8, neuron2=8…
[CV 2/5; 15/27] END dropout_rate=0.1, neuron1=8, neuron2=8;, score=0.714 total
time=   0.5s
[CV 3/5; 15/27] START dropout_rate=0.1, neuron1=8, neuron2=8…
[CV 3/5; 15/27] END dropout_rate=0.1, neuron1=8, neuron2=8;, score=0.760 total
time=   0.6s
[CV 4/5; 15/27] START dropout_rate=0.1, neuron1=8, neuron2=8…
[CV 4/5; 15/27] END dropout_rate=0.1, neuron1=8, neuron2=8;, score=0.830 total
time=   0.6s
[CV 5/5; 15/27] START dropout_rate=0.1, neuron1=8, neuron2=8…
[CV 5/5; 15/27] END dropout_rate=0.1, neuron1=8, neuron2=8;, score=0.758 total
time=   0.6s
[CV 1/5; 16/27] START dropout_rate=0.1, neuron1=16, neuron2=2…
[CV 1/5; 16/27] END dropout_rate=0.1, neuron1=16, neuron2=2;, score=0.766 total
time=   0.6s
[CV 2/5; 16/27] START dropout_rate=0.1, neuron1=16, neuron2=2…
[CV 2/5; 16/27] END dropout_rate=0.1, neuron1=16, neuron2=2;, score=0.714 total
time=   0.6s
[CV 3/5; 16/27] START dropout_rate=0.1, neuron1=16, neuron2=2…
[CV 3/5; 16/27] END dropout_rate=0.1, neuron1=16, neuron2=2;, score=0.760 total
time=   0.6s
[CV 4/5; 16/27] START dropout_rate=0.1, neuron1=16, neuron2=2…
[CV 4/5; 16/27] END dropout_rate=0.1, neuron1=16, neuron2=2;, score=0.817 total
time=   0.6s
[CV 5/5; 16/27] START dropout_rate=0.1, neuron1=16, neuron2=2…
[CV 5/5; 16/27] END dropout_rate=0.1, neuron1=16, neuron2=2;, score=0.771 total
time=   0.6s
[CV 1/5; 17/27] START dropout_rate=0.1, neuron1=16, neuron2=4…
[CV 1/5; 17/27] END dropout_rate=0.1, neuron1=16, neuron2=4;, score=0.773 total
time=   0.6s
[CV 2/5; 17/27] START dropout_rate=0.1, neuron1=16, neuron2=4…
[CV 2/5; 17/27] END dropout_rate=0.1, neuron1=16, neuron2=4;, score=0.721 total
time=   0.5s
[CV 3/5; 17/27] START dropout_rate=0.1, neuron1=16, neuron2=4…
[CV 3/5; 17/27] END dropout_rate=0.1, neuron1=16, neuron2=4;, score=0.747 total
time=   0.6s
```

```
[CV 4/5; 17/27] START dropout_rate=0.1, neuron1=16, neuron2=4…
[CV 4/5; 17/27] END dropout_rate=0.1, neuron1=16, neuron2=4;, score=0.837 total
time=   0.6s
[CV 5/5; 17/27] START dropout_rate=0.1, neuron1=16, neuron2=4…
[CV 5/5; 17/27] END dropout_rate=0.1, neuron1=16, neuron2=4;, score=0.758 total
time=   0.6s
[CV 1/5; 18/27] START dropout_rate=0.1, neuron1=16, neuron2=8…
[CV 1/5; 18/27] END dropout_rate=0.1, neuron1=16, neuron2=8;, score=0.773 total
time=   0.6s
[CV 2/5; 18/27] START dropout_rate=0.1, neuron1=16, neuron2=8…
[CV 2/5; 18/27] END dropout_rate=0.1, neuron1=16, neuron2=8;, score=0.727 total
time=   0.6s
[CV 3/5; 18/27] START dropout_rate=0.1, neuron1=16, neuron2=8…
[CV 3/5; 18/27] END dropout_rate=0.1, neuron1=16, neuron2=8;, score=0.753 total
time=   0.5s
[CV 4/5; 18/27] START dropout_rate=0.1, neuron1=16, neuron2=8…
[CV 4/5; 18/27] END dropout_rate=0.1, neuron1=16, neuron2=8;, score=0.830 total
time=   1.0s
[CV 5/5; 18/27] START dropout_rate=0.1, neuron1=16, neuron2=8…
[CV 5/5; 18/27] END dropout_rate=0.1, neuron1=16, neuron2=8;, score=0.745 total
time=   0.6s
[CV 1/5; 19/27] START dropout_rate=0.2, neuron1=4, neuron2=2…
[CV 1/5; 19/27] END dropout_rate=0.2, neuron1=4, neuron2=2;, score=0.753 total
time=   0.5s
[CV 2/5; 19/27] START dropout_rate=0.2, neuron1=4, neuron2=2…
[CV 2/5; 19/27] END dropout_rate=0.2, neuron1=4, neuron2=2;, score=0.669 total
time=   0.6s
[CV 3/5; 19/27] START dropout_rate=0.2, neuron1=4, neuron2=2…
[CV 3/5; 19/27] END dropout_rate=0.2, neuron1=4, neuron2=2;, score=0.740 total
time=   0.6s
[CV 4/5; 19/27] START dropout_rate=0.2, neuron1=4, neuron2=2…
[CV 4/5; 19/27] END dropout_rate=0.2, neuron1=4, neuron2=2;, score=0.804 total
time=   0.5s
[CV 5/5; 19/27] START dropout_rate=0.2, neuron1=4, neuron2=2…
[CV 5/5; 19/27] END dropout_rate=0.2, neuron1=4, neuron2=2;, score=0.739 total
time=   0.5s
[CV 1/5; 20/27] START dropout_rate=0.2, neuron1=4, neuron2=4…
[CV 1/5; 20/27] END dropout_rate=0.2, neuron1=4, neuron2=4;, score=0.760 total
time=   0.5s
[CV 2/5; 20/27] START dropout_rate=0.2, neuron1=4, neuron2=4…
[CV 2/5; 20/27] END dropout_rate=0.2, neuron1=4, neuron2=4;, score=0.669 total
time=   0.5s
[CV 3/5; 20/27] START dropout_rate=0.2, neuron1=4, neuron2=4…
[CV 3/5; 20/27] END dropout_rate=0.2, neuron1=4, neuron2=4;, score=0.727 total
time=   0.5s
[CV 4/5; 20/27] START dropout_rate=0.2, neuron1=4, neuron2=4…
[CV 4/5; 20/27] END dropout_rate=0.2, neuron1=4, neuron2=4;, score=0.824 total
time=   0.5s
```

```
[CV 5/5; 20/27] START dropout_rate=0.2, neuron1=4, neuron2=4…
[CV 5/5; 20/27] END dropout_rate=0.2, neuron1=4, neuron2=4;, score=0.732 total
time=   0.5s
[CV 1/5; 21/27] START dropout_rate=0.2, neuron1=4, neuron2=8…
[CV 1/5; 21/27] END dropout_rate=0.2, neuron1=4, neuron2=8;, score=0.766 total
time=   0.5s
[CV 2/5; 21/27] START dropout_rate=0.2, neuron1=4, neuron2=8…
[CV 2/5; 21/27] END dropout_rate=0.2, neuron1=4, neuron2=8;, score=0.682 total
time=   0.5s
[CV 3/5; 21/27] START dropout_rate=0.2, neuron1=4, neuron2=8…
[CV 3/5; 21/27] END dropout_rate=0.2, neuron1=4, neuron2=8;, score=0.747 total
time=   0.5s
[CV 4/5; 21/27] START dropout_rate=0.2, neuron1=4, neuron2=8…
[CV 4/5; 21/27] END dropout_rate=0.2, neuron1=4, neuron2=8;, score=0.817 total
time=   0.5s
[CV 5/5; 21/27] START dropout_rate=0.2, neuron1=4, neuron2=8…
[CV 5/5; 21/27] END dropout_rate=0.2, neuron1=4, neuron2=8;, score=0.765 total
time=   0.5s
[CV 1/5; 22/27] START dropout_rate=0.2, neuron1=8, neuron2=2…
[CV 1/5; 22/27] END dropout_rate=0.2, neuron1=8, neuron2=2;, score=0.773 total
time=   0.5s
[CV 2/5; 22/27] START dropout_rate=0.2, neuron1=8, neuron2=2…
[CV 2/5; 22/27] END dropout_rate=0.2, neuron1=8, neuron2=2;, score=0.688 total
time=   0.6s
[CV 3/5; 22/27] START dropout_rate=0.2, neuron1=8, neuron2=2…
[CV 3/5; 22/27] END dropout_rate=0.2, neuron1=8, neuron2=2;, score=0.740 total
time=   0.5s
[CV 4/5; 22/27] START dropout_rate=0.2, neuron1=8, neuron2=2…
[CV 4/5; 22/27] END dropout_rate=0.2, neuron1=8, neuron2=2;, score=0.797 total
time=   1.1s
[CV 5/5; 22/27] START dropout_rate=0.2, neuron1=8, neuron2=2…
[CV 5/5; 22/27] END dropout_rate=0.2, neuron1=8, neuron2=2;, score=0.771 total
time=   0.6s
[CV 1/5; 23/27] START dropout_rate=0.2, neuron1=8, neuron2=4…
[CV 1/5; 23/27] END dropout_rate=0.2, neuron1=8, neuron2=4;, score=0.747 total
time=   0.6s
[CV 2/5; 23/27] START dropout_rate=0.2, neuron1=8, neuron2=4…
[CV 2/5; 23/27] END dropout_rate=0.2, neuron1=8, neuron2=4;, score=0.708 total
time=   0.5s
[CV 3/5; 23/27] START dropout_rate=0.2, neuron1=8, neuron2=4…
[CV 3/5; 23/27] END dropout_rate=0.2, neuron1=8, neuron2=4;, score=0.747 total
time=   0.6s
[CV 4/5; 23/27] START dropout_rate=0.2, neuron1=8, neuron2=4…
[CV 4/5; 23/27] END dropout_rate=0.2, neuron1=8, neuron2=4;, score=0.837 total
time=   0.6s
[CV 5/5; 23/27] START dropout_rate=0.2, neuron1=8, neuron2=4…
[CV 5/5; 23/27] END dropout_rate=0.2, neuron1=8, neuron2=4;, score=0.765 total
time=   0.6s
```

```
[CV 1/5; 24/27] START dropout_rate=0.2, neuron1=8, neuron2=8…
[CV 1/5; 24/27] END dropout_rate=0.2, neuron1=8, neuron2=8;, score=0.766 total
time=   0.6s
[CV 2/5; 24/27] START dropout_rate=0.2, neuron1=8, neuron2=8…
[CV 2/5; 24/27] END dropout_rate=0.2, neuron1=8, neuron2=8;, score=0.708 total
time=   0.6s
[CV 3/5; 24/27] START dropout_rate=0.2, neuron1=8, neuron2=8…
[CV 3/5; 24/27] END dropout_rate=0.2, neuron1=8, neuron2=8;, score=0.760 total
time=   0.6s
[CV 4/5; 24/27] START dropout_rate=0.2, neuron1=8, neuron2=8…
[CV 4/5; 24/27] END dropout_rate=0.2, neuron1=8, neuron2=8;, score=0.837 total
time=   0.7s
[CV 5/5; 24/27] START dropout_rate=0.2, neuron1=8, neuron2=8…
[CV 5/5; 24/27] END dropout_rate=0.2, neuron1=8, neuron2=8;, score=0.765 total
time=   0.6s
[CV 1/5; 25/27] START dropout_rate=0.2, neuron1=16, neuron2=2…
[CV 1/5; 25/27] END dropout_rate=0.2, neuron1=16, neuron2=2;, score=0.760 total
time=   0.6s
[CV 2/5; 25/27] START dropout_rate=0.2, neuron1=16, neuron2=2…
[CV 2/5; 25/27] END dropout_rate=0.2, neuron1=16, neuron2=2;, score=0.708 total
time=   0.6s
[CV 3/5; 25/27] START dropout_rate=0.2, neuron1=16, neuron2=2…
[CV 3/5; 25/27] END dropout_rate=0.2, neuron1=16, neuron2=2;, score=0.760 total
time=   0.5s
[CV 4/5; 25/27] START dropout_rate=0.2, neuron1=16, neuron2=2…
[CV 4/5; 25/27] END dropout_rate=0.2, neuron1=16, neuron2=2;, score=0.817 total
time=   0.5s
[CV 5/5; 25/27] START dropout_rate=0.2, neuron1=16, neuron2=2…
[CV 5/5; 25/27] END dropout_rate=0.2, neuron1=16, neuron2=2;, score=0.765 total
time=   0.6s
[CV 1/5; 26/27] START dropout_rate=0.2, neuron1=16, neuron2=4…
[CV 1/5; 26/27] END dropout_rate=0.2, neuron1=16, neuron2=4;, score=0.760 total
time=   0.6s
[CV 2/5; 26/27] START dropout_rate=0.2, neuron1=16, neuron2=4…
[CV 2/5; 26/27] END dropout_rate=0.2, neuron1=16, neuron2=4;, score=0.714 total
time=   0.5s
[CV 3/5; 26/27] START dropout_rate=0.2, neuron1=16, neuron2=4…
[CV 3/5; 26/27] END dropout_rate=0.2, neuron1=16, neuron2=4;, score=0.753 total
time=   0.6s
[CV 4/5; 26/27] START dropout_rate=0.2, neuron1=16, neuron2=4…
[CV 4/5; 26/27] END dropout_rate=0.2, neuron1=16, neuron2=4;, score=0.830 total
time=   0.6s
[CV 5/5; 26/27] START dropout_rate=0.2, neuron1=16, neuron2=4…
[CV 5/5; 26/27] END dropout_rate=0.2, neuron1=16, neuron2=4;, score=0.765 total
time=   1.0s
[CV 1/5; 27/27] START dropout_rate=0.2, neuron1=16, neuron2=8…
[CV 1/5; 27/27] END dropout_rate=0.2, neuron1=16, neuron2=8;, score=0.766 total
time=   0.5s
```

```
[CV 2/5; 27/27] START dropout_rate=0.2, neuron1=16, neuron2=8…
[CV 2/5; 27/27] END dropout_rate=0.2, neuron1=16, neuron2=8;, score=0.727 total
time=   0.5s
[CV 3/5; 27/27] START dropout_rate=0.2, neuron1=16, neuron2=8…
[CV 3/5; 27/27] END dropout_rate=0.2, neuron1=16, neuron2=8;, score=0.753 total
time=   0.6s
[CV 4/5; 27/27] START dropout_rate=0.2, neuron1=16, neuron2=8…
[CV 4/5; 27/27] END dropout_rate=0.2, neuron1=16, neuron2=8;, score=0.824 total
time=   0.6s
[CV 5/5; 27/27] START dropout_rate=0.2, neuron1=16, neuron2=8…
[CV 5/5; 27/27] END dropout_rate=0.2, neuron1=16, neuron2=8;, score=0.771 total
time=   0.5s
```

[18]:
```
# Summarize the results
print('Best : {}, using {}'.format(grid_result.best_score_,grid_result.
  ↪best_params_))
means = grid_result.cv_results_['mean_test_score']
stds = grid_result.cv_results_['std_test_score']
params = grid_result.cv_results_['params']
for mean, stdev, param in zip(means, stds, params):
  print('{},{} with: {}'.format(mean, stdev, param))
```

```
Best : 0.7696290612220764, using {'dropout_rate': 0.0, 'neuron1': 16, 'neuron2':
2}
0.7357609868049622,0.039533107185542926 with: {'dropout_rate': 0.0, 'neuron1':
4, 'neuron2': 2}
0.7435701608657836,0.041171628899017466 with: {'dropout_rate': 0.0, 'neuron1':
4, 'neuron2': 4}
0.7552839279174804,0.03873777214845699 with: {'dropout_rate': 0.0, 'neuron1': 4,
'neuron2': 8}
0.747508704662323,0.04642591760479889 with: {'dropout_rate': 0.0, 'neuron1': 8,
'neuron2': 2}
0.7553009033203125,0.04316958224239693 with: {'dropout_rate': 0.0, 'neuron1': 8,
'neuron2': 4}
0.7656990051269531,0.03468605788127298 with: {'dropout_rate': 0.0, 'neuron1': 8,
'neuron2': 8}
0.7696290612220764,0.04160158455691619 with: {'dropout_rate': 0.0, 'neuron1':
16, 'neuron2': 2}
0.7696120858192443,0.0404945687156337 with: {'dropout_rate': 0.0, 'neuron1': 16,
'neuron2': 4}
0.7682964086532593,0.035408110721954086 with: {'dropout_rate': 0.0, 'neuron1':
16, 'neuron2': 8}
0.7422375082969666,0.032185949878950064 with: {'dropout_rate': 0.1, 'neuron1':
4, 'neuron2': 2}
0.7461675643920899,0.036980631252273265 with: {'dropout_rate': 0.1, 'neuron1':
4, 'neuron2': 4}
0.7527119994163514,0.04955775826409105 with: {'dropout_rate': 0.1, 'neuron1': 4,
'neuron2': 8}
```

```
0.7474662661552429,0.029493174625115116 with: {'dropout_rate': 0.1, 'neuron1':
8, 'neuron2': 2}
0.7539937257766723,0.04174796284316365 with: {'dropout_rate': 0.1, 'neuron1': 8,
'neuron2': 4}
0.7644003033638,0.037163479586072225 with: {'dropout_rate': 0.1, 'neuron1': 8,
'neuron2': 8}
0.7656990051269531,0.0326832168641794 with: {'dropout_rate': 0.1, 'neuron1': 16,
'neuron2': 2}
0.7670062065124512,0.03873345538428774 with: {'dropout_rate': 0.1, 'neuron1':
16, 'neuron2': 4}
0.7656820297241211,0.03535098103557391 with: {'dropout_rate': 0.1, 'neuron1':
16, 'neuron2': 8}
0.7409642696380615,0.043183173800647345 with: {'dropout_rate': 0.2, 'neuron1':
4, 'neuron2': 2}
0.7422799468040466,0.05026214854655702 with: {'dropout_rate': 0.2, 'neuron1': 4,
'neuron2': 4}
0.7553009152412414,0.04355852560157687 with: {'dropout_rate': 0.2, 'neuron1': 4,
'neuron2': 8}
0.7539852380752563,0.03750746714102999 with: {'dropout_rate': 0.2, 'neuron1': 8,
'neuron2': 2}
0.7605211973190308,0.042344190722653524 with: {'dropout_rate': 0.2, 'neuron1':
8, 'neuron2': 4}
0.7670146822929382,0.041008431889204396 with: {'dropout_rate': 0.2, 'neuron1':
8, 'neuron2': 8}
0.7617944121360779,0.03458349046309674 with: {'dropout_rate': 0.2, 'neuron1':
16, 'neuron2': 2}
0.7644087910652161,0.03733519212227929 with: {'dropout_rate': 0.2, 'neuron1':
16, 'neuron2': 4}
0.7683048963546752,0.031537435724601735 with: {'dropout_rate': 0.2, 'neuron1':
16, 'neuron2': 8}
```

Training model with optimum values of Hyperparameters

[28]:
```
from sklearn.metrics import accuracy_score

# Define the model with the optimum parameters
def create_model():
    model = Sequential()
    model.add(Dense(16, input_dim=8, kernel_initializer='normal',␣
 ↪activation='linear'))
    model.add(Dropout(0.2))
    model.add(Dense(4, kernel_initializer='normal', activation='linear'))
    model.add(Dropout(0.2))
    model.add(Dense(1, activation='sigmoid'))

    adam = Adam(lr=0.01)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
```

```
    return model

# Create the model
model = KerasClassifier(build_fn=create_model, verbose=0, batch_size=40,␣
 ↪epochs=10)

# Fit the model
model.fit(X_standardized, y)

# Predict using the trained model
y_predict = model.predict(X_standardized)

# Print the accuracy score
print("Accuracy Score:", accuracy_score(y, y_predict))
```

```
Accuracy Score: 0.77734375
```

1 Hyperparameters all at once

[30]:
```
from keras.layers import Dropout
from keras.optimizers import Adam
from keras.models import Sequential
from keras.wrappers.scikit_learn import KerasClassifier
from sklearn.model_selection import GridSearchCV, KFold

# Defining the model
def create_model(learning_rate, dropout_rate, activation_function, init,␣
 ↪neuron1, neuron2):
    model = Sequential()
    model.add(Dense(neuron1, input_dim=8, kernel_initializer=init,␣
 ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
    model.add(Dense(neuron2, input_dim=neuron1, kernel_initializer=init,␣
 ↪activation=activation_function))
    model.add(Dropout(dropout_rate))
    model.add(Dense(1, activation='sigmoid'))

    adam = Adam(lr=learning_rate)
    model.compile(loss='binary_crossentropy', optimizer=adam,␣
 ↪metrics=['accuracy'])
    return model

# Create the model
model = KerasClassifier(build_fn=create_model, verbose=0)

# Define the grid search parameters
```

```
batch_size = [20, 40]
epochs = [50, 100]
learning_rate = [0.001, 0.01]
dropout_rate = [0.1, 0.2]
activation_function = ['relu', 'tanh']
init = ['uniform', 'normal']
neuron1 = [8, 16]
neuron2 = [4, 8]

# Make a dictionary of the grid search parameters
param_grids = dict(batch_size=batch_size, epochs=epochs,␣
 ↪learning_rate=learning_rate,
                   dropout_rate=dropout_rate,␣
 ↪activation_function=activation_function,
                   init=init, neuron1=neuron1, neuron2=neuron2)

# Build and fit the GridSearchCV
grid = GridSearchCV(estimator=model, param_grid=param_grids, cv=KFold(),␣
 ↪verbose=10)
grid_result = grid.fit(X_standardized, y)

# Summarize the results
print('Best : {}, using {}'.format(grid_result.best_score_, grid_result.
 ↪best_params_))
means = grid_result.cv_results_['mean_test_score']
stds = grid_result.cv_results_['std_test_score']
params = grid_result.cv_results_['params']
for mean, stdev, param in zip(means, stds, params):
    print('{},{} with: {}'.format(mean, stdev, param))
```

```
Fitting 5 folds for each of 256 candidates, totalling 1280 fits
[CV 1/5; 1/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4
[CV 1/5; 1/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4;, score=0.753
total time=   1.7s
[CV 2/5; 1/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4
[CV 2/5; 1/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4;, score=0.708
total time=   1.8s
[CV 3/5; 1/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4
[CV 3/5; 1/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4;, score=0.766
total time=   1.7s
[CV 4/5; 1/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
```

```
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4
[CV 4/5; 1/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4;, score=0.843
total time=   1.8s
[CV 5/5; 1/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4
[CV 5/5; 1/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=4;, score=0.765
total time=   1.7s
[CV 1/5; 2/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8
[CV 1/5; 2/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8;, score=0.760
total time=   1.7s
[CV 2/5; 2/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8
[CV 2/5; 2/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8;, score=0.701
total time=   1.6s
[CV 3/5; 2/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8
[CV 3/5; 2/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8;, score=0.753
total time=   1.7s
[CV 4/5; 2/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8
[CV 4/5; 2/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8;, score=0.837
total time=   1.7s
[CV 5/5; 2/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8
[CV 5/5; 2/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=8, neuron2=8;, score=0.752
total time=   1.7s
[CV 1/5; 3/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4
[CV 1/5; 3/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4;,
score=0.727 total time=   1.8s
[CV 2/5; 3/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4
[CV 2/5; 3/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4;,
score=0.727 total time=   1.7s
[CV 3/5; 3/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4
[CV 3/5; 3/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4;,
```

```
score=0.760 total time=   1.6s
[CV 4/5; 3/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4
[CV 4/5; 3/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4;,
score=0.843 total time=   1.8s
[CV 5/5; 3/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4
[CV 5/5; 3/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=4;,
score=0.765 total time=   2.2s
[CV 1/5; 4/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8
[CV 1/5; 4/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8;,
score=0.747 total time=   1.8s
[CV 2/5; 4/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8
[CV 2/5; 4/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8;,
score=0.721 total time=   1.9s
[CV 3/5; 4/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8
[CV 3/5; 4/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8;,
score=0.760 total time=   1.9s
[CV 4/5; 4/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8
[CV 4/5; 4/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8;,
score=0.850 total time=   1.8s
[CV 5/5; 4/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8
[CV 5/5; 4/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.001, neuron1=16, neuron2=8;,
score=0.765 total time=   1.7s
[CV 1/5; 5/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4
[CV 1/5; 5/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4;, score=0.721
total time=   1.7s
[CV 2/5; 5/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4
[CV 2/5; 5/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4;, score=0.695
total time=   1.8s
[CV 3/5; 5/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4
```

```
[CV 3/5; 5/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4;, score=0.773
total time=   1.7s
[CV 4/5; 5/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4
[CV 4/5; 5/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4;, score=0.830
total time=   1.7s
[CV 5/5; 5/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4
[CV 5/5; 5/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=4;, score=0.745
total time=   1.8s
[CV 1/5; 6/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8
[CV 1/5; 6/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8;, score=0.753
total time=   1.8s
[CV 2/5; 6/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8
[CV 2/5; 6/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8;, score=0.734
total time=   1.8s
[CV 3/5; 6/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8
[CV 3/5; 6/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8;, score=0.779
total time=   1.7s
[CV 4/5; 6/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8
[CV 4/5; 6/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8;, score=0.797
total time=   1.9s
[CV 5/5; 6/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8
[CV 5/5; 6/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=8, neuron2=8;, score=0.752
total time=   1.7s
[CV 1/5; 7/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4
[CV 1/5; 7/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4;, score=0.740
total time=   1.8s
[CV 2/5; 7/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4
[CV 2/5; 7/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4;, score=0.708
total time=   1.9s
```

```
[CV 3/5; 7/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4
[CV 3/5; 7/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4;, score=0.760
total time=   1.8s
[CV 4/5; 7/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4
[CV 4/5; 7/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4;, score=0.804
total time=   1.8s
[CV 5/5; 7/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4
[CV 5/5; 7/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=4;, score=0.745
total time=   1.8s
[CV 1/5; 8/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8
[CV 1/5; 8/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8;, score=0.747
total time=   1.7s
[CV 2/5; 8/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8
[CV 2/5; 8/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8;, score=0.662
total time=   1.8s
[CV 3/5; 8/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8
[CV 3/5; 8/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8;, score=0.753
total time=   1.7s
[CV 4/5; 8/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8
[CV 4/5; 8/256] END activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8;, score=0.830
total time=   1.7s
[CV 5/5; 8/256] START activation_function=relu, batch_size=20, dropout_rate=0.1,
epochs=50, init=uniform, learning_rate=0.01, neuron1=16, neuron2=8
```

[31]:
```
from sklearn.metrics import accuracy_score
from sklearn.model_selection import train_test_split

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X_standardized, y,␣
 ↪test_size=0.2, random_state=42)

# Get the best model from the grid search
best_model = grid_result.best_estimator_
```

```
# Train the best model on the training data
best_model.fit(X_train, y_train)

# Predictions on training data
y_train_pred = best_model.predict(X_train)
train_accuracy = accuracy_score(y_train, y_train_pred)

# Predictions on testing data
y_test_pred = best_model.predict(X_test)
test_accuracy = accuracy_score(y_test, y_test_pred)

print("Training Accuracy:", train_accuracy)
print("Testing Accuracy:", test_accuracy)
```

```
20/20 [==============================] - 0s 696us/step
5/5 [==============================] - 0s 628us/step
Training Accuracy: 0.7947882736156352
Testing Accuracy: 0.7467532467532467
```

[ ]: