In [1]:
```
import pandas as d
import matplotlib.pyplot as m
import seaborn as sns
import numpy as n
```

In [2]:
```
from matplotlib import style
m.style.use('ggplot')
```

In [3]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [4]:
```
df=d.read_excel('/Users/ayush/Desktop/DATA_NEW.xlsx',engine="openpyxl")
```

In [5]:
```
df.drop(['Sample No','AP','AR'],axis=1,inplace=True)
```

In [6]:
```
df.columns=['V','I','WS','NPD','G','BW','RH','P','%D','MDR']
df
```

Out[6]:

| | V | I | WS | NPD | G | BW | RH | P | %D | MDR |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 25 | 200 | 5.5 | 18 | 20 | 7.20 | 3.52 | 2.38 | 35.73837 | 3.019104 |
| **1** | 27 | 200 | 5.5 | 18 | 18 | 9.37 | 3.77 | 1.99 | 35.75795 | 3.329568 |
| **2** | 25 | 220 | 5.5 | 18 | 18 | 8.55 | 3.54 | 2.62 | 35.71841 | 3.529152 |
| **3** | 27 | 220 | 5.5 | 18 | 20 | 8.47 | 3.81 | 3.54 | 41.70224 | 3.461040 |
| **4** | 25 | 200 | 6.5 | 18 | 18 | 7.74 | 3.06 | 1.57 | 29.12951 | 3.124368 |
| **5** | 27 | 200 | 6.5 | 18 | 20 | 8.72 | 3.64 | 2.08 | 29.51183 | 3.568032 |
| **6** | 25 | 220 | 6.5 | 18 | 20 | 6.47 | 3.35 | 2.48 | 35.49750 | 3.143088 |
| **7** | 27 | 220 | 6.5 | 18 | 18 | 8.48 | 3.00 | 3.20 | 38.04692 | 3.657888 |
| **8** | 25 | 200 | 5.5 | 20 | 18 | 7.24 | 3.16 | 1.62 | 29.28069 | 2.865456 |
| **9** | 27 | 200 | 5.5 | 20 | 20 | 7.45 | 3.58 | 1.90 | 33.88926 | 3.139488 |
| **10** | 25 | 220 | 5.5 | 20 | 20 | 9.29 | 3.61 | 2.14 | 29.00406 | 3.602016 |
| **11** | 27 | 220 | 5.5 | 20 | 18 | 9.09 | 3.77 | 2.08 | 28.78465 | 4.232448 |
| **12** | 25 | 200 | 6.5 | 20 | 20 | 6.55 | 3.35 | 1.85 | 26.98541 | 3.373344 |
| **13** | 27 | 200 | 6.5 | 20 | 18 | 7.10 | 3.12 | 2.02 | 27.67347 | 3.317184 |
| **14** | 25 | 220 | 6.5 | 20 | 18 | 7.47 | 3.16 | 2.18 | 35.86731 | 3.474432 |
| **15** | 27 | 220 | 6.5 | 20 | 20 | 8.55 | 3.04 | 2.20 | 33.66211 | 3.903120 |
| **16** | 24 | 210 | 6.0 | 19 | 19 | 7.27 | 3.44 | 1.58 | 26.03336 | 3.525120 |
| **17** | 28 | 210 | 6.0 | 19 | 19 | 10.31 | 3.54 | 3.07 | 38.41229 | 4.155840 |
| **18** | 26 | 190 | 6.0 | 19 | 19 | 7.51 | 3.08 | 1.62 | 28.80259 | 3.041280 |
| **19** | 26 | 230 | 6.0 | 19 | 19 | 8.05 | 3.47 | 2.28 | 33.11475 | 3.877632 |
| **20** | 26 | 210 | 5.0 | 19 | 19 | 7.79 | 4.04 | 3.00 | 39.37282 | 3.257280 |
| **21** | 26 | 210 | 7.0 | 19 | 19 | 7.48 | 3.56 | 2.68 | 38.37012 | 4.390848 |
| **22** | 26 | 210 | 6.0 | 17 | 19 | 8.91 | 3.01 | 2.55 | 38.73842 | 2.970432 |
| **23** | 26 | 210 | 6.0 | 21 | 19 | 9.30 | 3.18 | 1.50 | 29.08800 | 3.829248 |
| **24** | 26 | 210 | 6.0 | 19 | 17 | 8.20 | 3.06 | 2.31 | 35.05808 | 3.188160 |

| | V | I | WS | NPD | G | BW | RH | P | %D | MDR |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 26 | 210 | 6.0 | 19 | 21 | 8.28 | 3.21 | 2.40 | 37.23329 | 3.049920 |
| **26** | 26 | 210 | 6.0 | 19 | 19 | 7.95 | 3.55 | 2.31 | 33.84997 | 3.687552 |
| **27** | 26 | 210 | 6.0 | 19 | 19 | 8.46 | 3.32 | 1.82 | 29.75694 | 3.495744 |
| **28** | 26 | 210 | 6.0 | 19 | 19 | 8.59 | 3.58 | 2.14 | 31.93018 | 3.436992 |
| **29** | 26 | 210 | 6.0 | 19 | 19 | 8.39 | 3.64 | 2.31 | 34.72699 | 3.614976 |
| **30** | 26 | 210 | 6.0 | 19 | 19 | 9.65 | 3.64 | 2.20 | 33.20777 | 3.983040 |
| **31** | 26 | 210 | 6.0 | 19 | 19 | 9.62 | 3.93 | 2.00 | 32.13483 | 4.174848 |

In [7]:
```
df_repeated=df.iloc[26:32]
df_repeated.describe()
```

Out[7]:

| | V | I | WS | NPD | G | BW | RH | P | %D | MDR |
|---|---|---|---|---|---|---|---|---|---|---|
| **count** | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.000000 | 6.000000 | 6.000000 | 6.000000 | 6.000000 |
| **mean** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 8.776667 | 3.610000 | 2.130000 | 32.601113 | 3.732192 |
| **std** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.698847 | 0.196367 | 0.191207 | 1.743784 | 0.289016 |
| **min** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 7.950000 | 3.320000 | 1.820000 | 29.756940 | 3.436992 |
| **25%** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 8.407500 | 3.557500 | 2.035000 | 31.981343 | 3.525552 |
| **50%** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 8.525000 | 3.610000 | 2.170000 | 32.671300 | 3.651264 |
| **75%** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 9.362500 | 3.640000 | 2.282500 | 33.689420 | 3.909168 |
| **max** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 9.650000 | 3.930000 | 2.310000 | 34.726990 | 4.174848 |

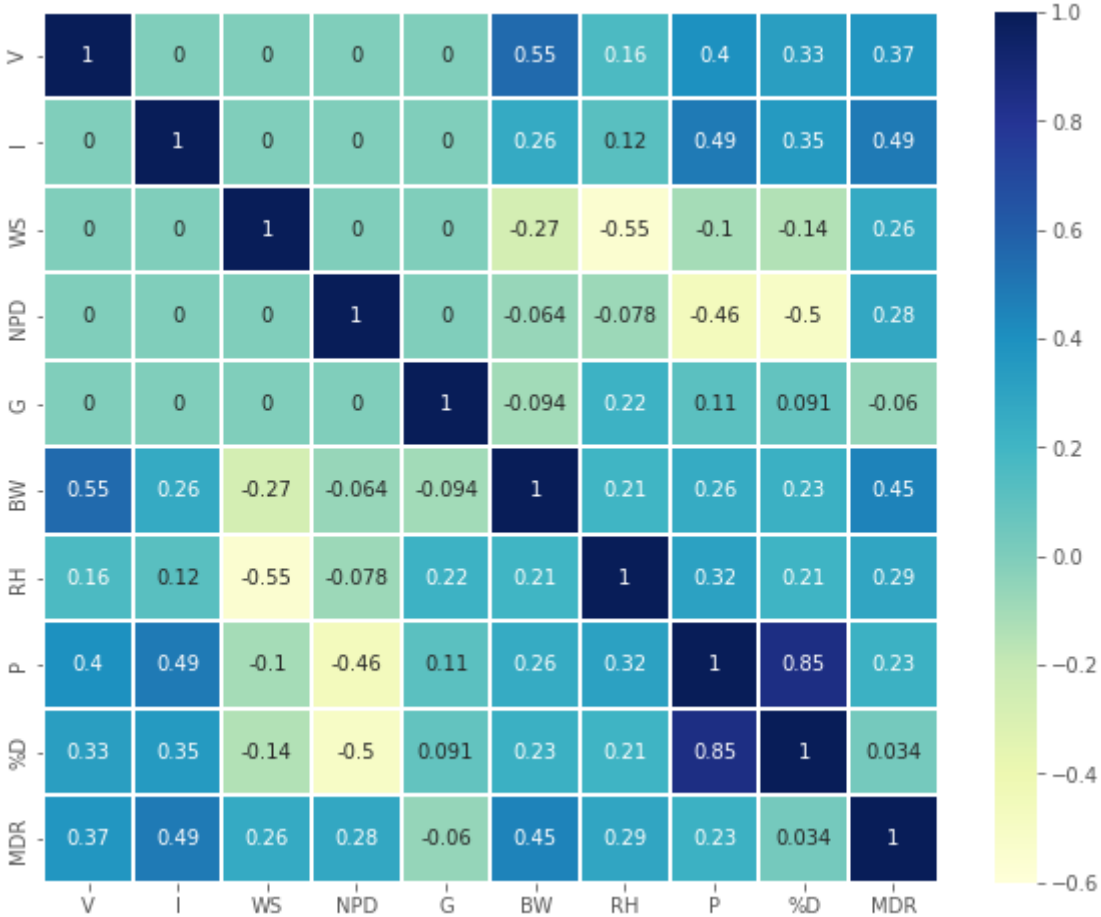
In [8]:
```
df.drop(df.index[26:32], axis=0,inplace=True)
```

In [9]:
```
df2 = {'V':26,'I':210,'WS':6.0,'NPD':19,'G':19,'BW':8.52,'RH':3.61,'P':2.17,'
df_new = df.append(df2, ignore_index = True)
display(df_new)
```

| | V | I | WS | NPD | G | BW | RH | P | %D | MDR |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 25.0 | 200.0 | 5.5 | 18.0 | 20.0 | 7.20 | 3.52 | 2.38 | 35.73837 | 3.019104 |
| **1** | 27.0 | 200.0 | 5.5 | 18.0 | 18.0 | 9.37 | 3.77 | 1.99 | 35.75795 | 3.329568 |
| **2** | 25.0 | 220.0 | 5.5 | 18.0 | 18.0 | 8.55 | 3.54 | 2.62 | 35.71841 | 3.529152 |
| **3** | 27.0 | 220.0 | 5.5 | 18.0 | 20.0 | 8.47 | 3.81 | 3.54 | 41.70224 | 3.461040 |
| **4** | 25.0 | 200.0 | 6.5 | 18.0 | 18.0 | 7.74 | 3.06 | 1.57 | 29.12951 | 3.124368 |
| **5** | 27.0 | 200.0 | 6.5 | 18.0 | 20.0 | 8.72 | 3.64 | 2.08 | 29.51183 | 3.568032 |
| **6** | 25.0 | 220.0 | 6.5 | 18.0 | 20.0 | 6.47 | 3.35 | 2.48 | 35.49750 | 3.143088 |
| **7** | 27.0 | 220.0 | 6.5 | 18.0 | 18.0 | 8.48 | 3.00 | 3.20 | 38.04692 | 3.657888 |
| **8** | 25.0 | 200.0 | 5.5 | 20.0 | 18.0 | 7.24 | 3.16 | 1.62 | 29.28069 | 2.865456 |
| **9** | 27.0 | 200.0 | 5.5 | 20.0 | 20.0 | 7.45 | 3.58 | 1.90 | 33.88926 | 3.139488 |
| **10** | 25.0 | 220.0 | 5.5 | 20.0 | 20.0 | 9.29 | 3.61 | 2.14 | 29.00406 | 3.602016 |
| **11** | 27.0 | 220.0 | 5.5 | 20.0 | 18.0 | 9.09 | 3.77 | 2.08 | 28.78465 | 4.232448 |
| **12** | 25.0 | 200.0 | 6.5 | 20.0 | 20.0 | 6.55 | 3.35 | 1.85 | 26.98541 | 3.373344 |

| | V | I | WS | NPD | G | BW | RH | P | %D | MDR |
|---|---|---|---|---|---|---|---|---|---|---|
| **13** | 27.0 | 200.0 | 6.5 | 20.0 | 18.0 | 7.10 | 3.12 | 2.02 | 27.67347 | 3.317184 |
| **14** | 25.0 | 220.0 | 6.5 | 20.0 | 18.0 | 7.47 | 3.16 | 2.18 | 35.86731 | 3.474432 |
| **15** | 27.0 | 220.0 | 6.5 | 20.0 | 20.0 | 8.55 | 3.04 | 2.20 | 33.66211 | 3.903120 |
| **16** | 24.0 | 210.0 | 6.0 | 19.0 | 19.0 | 7.27 | 3.44 | 1.58 | 26.03336 | 3.525120 |
| **17** | 28.0 | 210.0 | 6.0 | 19.0 | 19.0 | 10.31 | 3.54 | 3.07 | 38.41229 | 4.155840 |
| **18** | 26.0 | 190.0 | 6.0 | 19.0 | 19.0 | 7.51 | 3.08 | 1.62 | 28.80259 | 3.041280 |
| **19** | 26.0 | 230.0 | 6.0 | 19.0 | 19.0 | 8.05 | 3.47 | 2.28 | 33.11475 | 3.877632 |
| **20** | 26.0 | 210.0 | 5.0 | 19.0 | 19.0 | 7.79 | 4.04 | 3.00 | 39.37282 | 3.257280 |
| **21** | 26.0 | 210.0 | 7.0 | 19.0 | 19.0 | 7.48 | 3.56 | 2.68 | 38.37012 | 4.390848 |
| **22** | 26.0 | 210.0 | 6.0 | 17.0 | 19.0 | 8.91 | 3.01 | 2.55 | 38.73842 | 2.970432 |
| **23** | 26.0 | 210.0 | 6.0 | 21.0 | 19.0 | 9.30 | 3.18 | 1.50 | 29.08800 | 3.829248 |
| **24** | 26.0 | 210.0 | 6.0 | 19.0 | 17.0 | 8.20 | 3.06 | 2.31 | 35.05808 | 3.188160 |
| **25** | 26.0 | 210.0 | 6.0 | 19.0 | 21.0 | 8.28 | 3.21 | 2.40 | 37.23329 | 3.049920 |
| **26** | 26.0 | 210.0 | 6.0 | 19.0 | 19.0 | 8.52 | 3.61 | 2.17 | 32.67000 | 3.650000 |

In [10]:
```
m.figure(figsize=(10,8))
ax1 = sns.heatmap(df_new.corr(), vmin=-0.6, vmax=1,linewidths=1, cmap='YlGnBu
ax1.set_yticklabels(labels=ax1.get_yticklabels(), va='center')
#m.savefig("heatmap_last.jpg",dpi=500)
m.show()
```




In [10]:
```
X=df_new.loc[:,['V','I','WS','NPD','G']]          # Features!
Y=df_new['%D']    # Target!
```

```
# Copy of original X and Y!!
X_copy=X
Y_copy=Y
```

In [11]:
```
from sklearn import preprocessing
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import GridSearchCV
from sklearn.svm import SVR
```

In [12]:
```
Sx = StandardScaler()
Sy= StandardScaler()
X_t = Sx.fit_transform(X)   # using subscript "te" for testing!
Y_t = Sy.fit_transform(Y.values.reshape(-1,1))
```

In [13]:
```
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_absolute_error
```

In [14]:
```
X_train, X_test, Y_train, Y_test = train_test_split(X_t, Y_t, test_size = 0.0
```

In [15]:
```
svr = SVR(kernel='rbf',C=5,epsilon=0.1)
svr.fit(X_train, Y_train.ravel())  # ravel??
```

Out[15]:
```
SVR(C=5)
```

In [16]:
```
y_predT = svr.predict(X_train) #T subscript for training and Te for testing!!
y_predT = Sy.inverse_transform(y_predT.reshape(-1, 1))

maeT = mean_absolute_error(Sy.inverse_transform(Y_train.reshape(-1, 1)), y_pr
print('MAE-Training = ', maeT)
```

```
MAE-Training =  0.4085521595314802
```

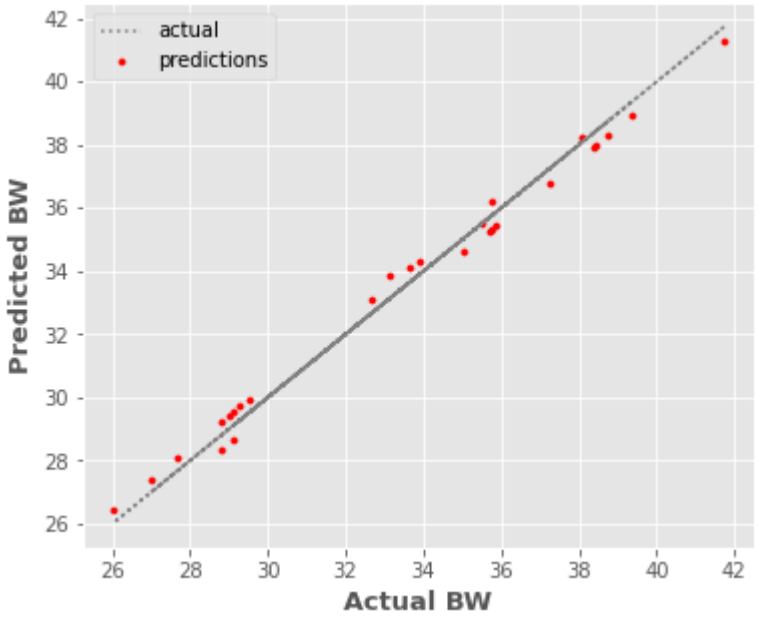
In [17]:
```
y_predTe = svr.predict(X_test)
y_predTe = Sy.inverse_transform(y_predTe.reshape(-1, 1))

maeTe = mean_absolute_error(Sy.inverse_transform(Y_test.reshape(-1, 1)), y_pr
print('MAE-Testing = ', maeTe)
```

```
MAE-Testing =  0.7231701548803358
```

In [18]:
```
y_pref=svr.predict(X_t)   #model predictions..!!
y_pref=Sy.inverse_transform(y_pref.reshape(-1, 1))
```

In [19]:
```
m.figure(figsize=(6, 5))
m.plot(Y_copy,Y_copy,label='actual',color='grey',linestyle=':')
m.scatter(Y_copy,y_pref,label='predictions',s=10,color='red')
m.xlabel("Actual BW",fontsize=13,fontweight='bold')
m.ylabel("Predicted BW",fontsize=13,fontweight='bold')
m.legend()
#m.savefig("4_newws.png",dpi=150)
m.show()
```




In [21]:
```
param_grid = {'C': [0.001,0.01,0.1, 1,5,10,15,100,500,700,800,1000,1200,1400,
              'epsilon': [3,2,1, 0.1, 0.01, 0.001,0.001,0.0001,0.00001,0.0000
              'kernel': ['rbf']}

grid = GridSearchCV(SVR(), param_grid, refit = True, verbose = 3)

grid.fit(X_t, Y_t.ravel())
```

```
Fitting 5 folds for each of 160 candidates, totalling 800 fits
[CV 1/5] END ...C=0.001, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ...C=0.001, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ...C=0.001, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ...C=0.001, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ...C=0.001, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ...C=0.001, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ...C=0.001, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ...C=0.001, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ...C=0.001, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ...C=0.001, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ...C=0.001, epsilon=1, kernel=rbf;, score=-0.118 total time=   0.
0s
[CV 2/5] END ...C=0.001, epsilon=1, kernel=rbf;, score=-0.029 total time=   0.
0s
[CV 3/5] END ...C=0.001, epsilon=1, kernel=rbf;, score=-1.971 total time=   0.
0s
[CV 4/5] END ...C=0.001, epsilon=1, kernel=rbf;, score=-0.648 total time=   0.
0s
[CV 5/5] END ...C=0.001, epsilon=1, kernel=rbf;, score=-0.047 total time=   0.
0s
[CV 1/5] END .C=0.001, epsilon=0.1, kernel=rbf;, score=-0.064 total time=   0.
0s
[CV 2/5] END ..C=0.001, epsilon=0.1, kernel=rbf;, score=0.001 total time=   0.
0s
[CV 3/5] END .C=0.001, epsilon=0.1, kernel=rbf;, score=-2.018 total time=   0.
0s
[CV 4/5] END .C=0.001, epsilon=0.1, kernel=rbf;, score=-0.557 total time=   0.
```

```
0s
[CV 5/5] END .C=0.001, epsilon=0.1, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 1/5] END C=0.001, epsilon=0.01, kernel=rbf;, score=-0.087 total time=   0.
0s
[CV 2/5] END C=0.001, epsilon=0.01, kernel=rbf;, score=-0.004 total time=   0.
0s
[CV 3/5] END C=0.001, epsilon=0.01, kernel=rbf;, score=-2.033 total time=   0.
0s
[CV 4/5] END C=0.001, epsilon=0.01, kernel=rbf;, score=-0.493 total time=   0.
0s
[CV 5/5] END C=0.001, epsilon=0.01, kernel=rbf;, score=-0.004 total time=   0.
0s
[CV 1/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.087 total time=
0.0s
[CV 2/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 3/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-2.033 total time=
0.0s
[CV 4/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.493 total time=
0.0s
[CV 5/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 1/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.087 total time=
0.0s
[CV 2/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 3/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-2.033 total time=
0.0s
[CV 4/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.493 total time=
0.0s
[CV 5/5] END C=0.001, epsilon=0.001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 1/5] END C=0.001, epsilon=0.0001, kernel=rbf;, score=-0.087 total time=
0.0s
[CV 2/5] END C=0.001, epsilon=0.0001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 3/5] END C=0.001, epsilon=0.0001, kernel=rbf;, score=-2.033 total time=
0.0s
[CV 4/5] END C=0.001, epsilon=0.0001, kernel=rbf;, score=-0.493 total time=
0.0s
[CV 5/5] END C=0.001, epsilon=0.0001, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 1/5] END C=0.001, epsilon=1e-05, kernel=rbf;, score=-0.087 total time=
0.0s
[CV 2/5] END C=0.001, epsilon=1e-05, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 3/5] END C=0.001, epsilon=1e-05, kernel=rbf;, score=-2.033 total time=
0.0s
[CV 4/5] END C=0.001, epsilon=1e-05, kernel=rbf;, score=-0.493 total time=
0.0s
[CV 5/5] END C=0.001, epsilon=1e-05, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 1/5] END C=0.001, epsilon=1e-06, kernel=rbf;, score=-0.087 total time=
0.0s
[CV 2/5] END C=0.001, epsilon=1e-06, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 3/5] END C=0.001, epsilon=1e-06, kernel=rbf;, score=-2.033 total time=
0.0s
[CV 4/5] END C=0.001, epsilon=1e-06, kernel=rbf;, score=-0.493 total time=
0.0s
[CV 5/5] END C=0.001, epsilon=1e-06, kernel=rbf;, score=-0.004 total time=
0.0s
[CV 1/5] END ....C=0.01, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ....C=0.01, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=0.01, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
```

```
[CV 4/5] END ....C=0.01, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=0.01, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ....C=0.01, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ....C=0.01, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=0.01, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ....C=0.01, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=0.01, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ....C=0.01, epsilon=1, kernel=rbf;, score=-0.113 total time=   0.
0s
[CV 2/5] END ....C=0.01, epsilon=1, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 3/5] END ....C=0.01, epsilon=1, kernel=rbf;, score=-1.941 total time=   0.
0s
[CV 4/5] END ....C=0.01, epsilon=1, kernel=rbf;, score=-0.640 total time=   0.
0s
[CV 5/5] END ....C=0.01, epsilon=1, kernel=rbf;, score=-0.045 total time=   0.
0s
[CV 1/5] END ..C=0.01, epsilon=0.1, kernel=rbf;, score=-0.056 total time=   0.
0s
[CV 2/5] END ...C=0.01, epsilon=0.1, kernel=rbf;, score=0.007 total time=   0.
0s
[CV 3/5] END ..C=0.01, epsilon=0.1, kernel=rbf;, score=-1.990 total time=   0.
0s
[CV 4/5] END ..C=0.01, epsilon=0.1, kernel=rbf;, score=-0.549 total time=   0.
0s
[CV 5/5] END ..C=0.01, epsilon=0.1, kernel=rbf;, score=-0.003 total time=   0.
0s
[CV 1/5] END .C=0.01, epsilon=0.01, kernel=rbf;, score=-0.079 total time=   0.
0s
[CV 2/5] END ..C=0.01, epsilon=0.01, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END .C=0.01, epsilon=0.01, kernel=rbf;, score=-2.013 total time=   0.
0s
[CV 4/5] END .C=0.01, epsilon=0.01, kernel=rbf;, score=-0.486 total time=   0.
0s
[CV 5/5] END ..C=0.01, epsilon=0.01, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-0.080 total time=   0.
0s
[CV 2/5] END .C=0.01, epsilon=0.001, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-2.013 total time=   0.
0s
[CV 4/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-0.486 total time=   0.
0s
[CV 5/5] END .C=0.01, epsilon=0.001, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-0.080 total time=   0.
0s
[CV 2/5] END .C=0.01, epsilon=0.001, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-2.013 total time=   0.
0s
[CV 4/5] END C=0.01, epsilon=0.001, kernel=rbf;, score=-0.486 total time=   0.
0s
[CV 5/5] END .C=0.01, epsilon=0.001, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END C=0.01, epsilon=0.0001, kernel=rbf;, score=-0.080 total time=
0.0s
[CV 2/5] END C=0.01, epsilon=0.0001, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END C=0.01, epsilon=0.0001, kernel=rbf;, score=-2.013 total time=
```

```
0.0s
[CV 4/5] END C=0.01, epsilon=0.0001, kernel=rbf;, score=-0.486 total time=
0.0s
[CV 5/5] END C=0.01, epsilon=0.0001, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END C=0.01, epsilon=1e-05, kernel=rbf;, score=-0.080 total time=   0.
0s
[CV 2/5] END .C=0.01, epsilon=1e-05, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END C=0.01, epsilon=1e-05, kernel=rbf;, score=-2.013 total time=   0.
0s
[CV 4/5] END C=0.01, epsilon=1e-05, kernel=rbf;, score=-0.486 total time=   0.
0s
[CV 5/5] END .C=0.01, epsilon=1e-05, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END C=0.01, epsilon=1e-06, kernel=rbf;, score=-0.080 total time=   0.
0s
[CV 2/5] END .C=0.01, epsilon=1e-06, kernel=rbf;, score=0.003 total time=   0.
0s
[CV 3/5] END C=0.01, epsilon=1e-06, kernel=rbf;, score=-2.013 total time=   0.
0s
[CV 4/5] END C=0.01, epsilon=1e-06, kernel=rbf;, score=-0.486 total time=   0.
0s
[CV 5/5] END .C=0.01, epsilon=1e-06, kernel=rbf;, score=0.008 total time=   0.
0s
[CV 1/5] END .....C=0.1, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .....C=0.1, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END .....C=0.1, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .....C=0.1, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=0.1, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=0.1, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .....C=0.1, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END .....C=0.1, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .....C=0.1, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=0.1, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=0.1, epsilon=1, kernel=rbf;, score=-0.055 total time=   0.
0s
[CV 2/5] END ......C=0.1, epsilon=1, kernel=rbf;, score=0.017 total time=   0.
0s
[CV 3/5] END .....C=0.1, epsilon=1, kernel=rbf;, score=-1.816 total time=   0.
0s
[CV 4/5] END .....C=0.1, epsilon=1, kernel=rbf;, score=-0.542 total time=   0.
0s
[CV 5/5] END .....C=0.1, epsilon=1, kernel=rbf;, score=-0.049 total time=   0.
0s
[CV 1/5] END ...C=0.1, epsilon=0.1, kernel=rbf;, score=-0.008 total time=   0.
0s
[CV 2/5] END ....C=0.1, epsilon=0.1, kernel=rbf;, score=0.072 total time=   0.
0s
[CV 3/5] END ...C=0.1, epsilon=0.1, kernel=rbf;, score=-1.722 total time=   0.
0s
[CV 4/5] END ...C=0.1, epsilon=0.1, kernel=rbf;, score=-0.490 total time=   0.
0s
[CV 5/5] END ....C=0.1, epsilon=0.1, kernel=rbf;, score=0.140 total time=   0.
0s
[CV 1/5] END ..C=0.1, epsilon=0.01, kernel=rbf;, score=-0.016 total time=   0.
0s
[CV 2/5] END ...C=0.1, epsilon=0.01, kernel=rbf;, score=0.081 total time=   0.
0s
```

```
[CV 3/5] END ..C=0.1, epsilon=0.01, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END ..C=0.1, epsilon=0.01, kernel=rbf;, score=-0.459 total time=   0.
0s
[CV 5/5] END ...C=0.1, epsilon=0.01, kernel=rbf;, score=0.114 total time=   0.
0s
[CV 1/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-0.019 total time=   0.
0s
[CV 2/5] END ..C=0.1, epsilon=0.001, kernel=rbf;, score=0.083 total time=   0.
0s
[CV 3/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-0.453 total time=   0.
0s
[CV 5/5] END ..C=0.1, epsilon=0.001, kernel=rbf;, score=0.115 total time=   0.
0s
[CV 1/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-0.019 total time=   0.
0s
[CV 2/5] END ..C=0.1, epsilon=0.001, kernel=rbf;, score=0.083 total time=   0.
0s
[CV 3/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END .C=0.1, epsilon=0.001, kernel=rbf;, score=-0.453 total time=   0.
0s
[CV 5/5] END ..C=0.1, epsilon=0.001, kernel=rbf;, score=0.115 total time=   0.
0s
[CV 1/5] END C=0.1, epsilon=0.0001, kernel=rbf;, score=-0.019 total time=   0.
0s
[CV 2/5] END .C=0.1, epsilon=0.0001, kernel=rbf;, score=0.083 total time=   0.
0s
[CV 3/5] END C=0.1, epsilon=0.0001, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END C=0.1, epsilon=0.0001, kernel=rbf;, score=-0.452 total time=   0.
0s
[CV 5/5] END .C=0.1, epsilon=0.0001, kernel=rbf;, score=0.115 total time=   0.
0s
[CV 1/5] END .C=0.1, epsilon=1e-05, kernel=rbf;, score=-0.019 total time=   0.
0s
[CV 2/5] END ..C=0.1, epsilon=1e-05, kernel=rbf;, score=0.083 total time=   0.
0s
[CV 3/5] END .C=0.1, epsilon=1e-05, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END .C=0.1, epsilon=1e-05, kernel=rbf;, score=-0.452 total time=   0.
0s
[CV 5/5] END ..C=0.1, epsilon=1e-05, kernel=rbf;, score=0.115 total time=   0.
0s
[CV 1/5] END .C=0.1, epsilon=1e-06, kernel=rbf;, score=-0.019 total time=   0.
0s
[CV 2/5] END ..C=0.1, epsilon=1e-06, kernel=rbf;, score=0.083 total time=   0.
0s
[CV 3/5] END .C=0.1, epsilon=1e-06, kernel=rbf;, score=-1.825 total time=   0.
0s
[CV 4/5] END .C=0.1, epsilon=1e-06, kernel=rbf;, score=-0.453 total time=   0.
0s
[CV 5/5] END ..C=0.1, epsilon=1e-06, kernel=rbf;, score=0.115 total time=   0.
0s
[CV 1/5] END .......C=1, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .......C=1, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END .......C=1, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .......C=1, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .......C=1, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .......C=1, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .......C=1, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
```

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0s
[CV 3/5] END .......C=1, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .......C=1, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .......C=1, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ........C=1, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END ........C=1, epsilon=1, kernel=rbf;, score=0.184 total time=   0.
0s
[CV 3/5] END .......C=1, epsilon=1, kernel=rbf;, score=-1.378 total time=   0.
0s
[CV 4/5] END ........C=1, epsilon=1, kernel=rbf;, score=0.204 total time=   0.
0s
[CV 5/5] END .......C=1, epsilon=1, kernel=rbf;, score=-0.140 total time=   0.
0s
[CV 1/5] END ......C=1, epsilon=0.1, kernel=rbf;, score=0.237 total time=   0.
0s
[CV 2/5] END ......C=1, epsilon=0.1, kernel=rbf;, score=0.418 total time=   0.
0s
[CV 3/5] END .....C=1, epsilon=0.1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 4/5] END .....C=1, epsilon=0.1, kernel=rbf;, score=-0.118 total time=   0.
0s
[CV 5/5] END ......C=1, epsilon=0.1, kernel=rbf;, score=0.664 total time=   0.
0s
[CV 1/5] END .....C=1, epsilon=0.01, kernel=rbf;, score=0.221 total time=   0.
0s
[CV 2/5] END .....C=1, epsilon=0.01, kernel=rbf;, score=0.425 total time=   0.
0s
[CV 3/5] END ....C=1, epsilon=0.01, kernel=rbf;, score=-0.167 total time=   0.
0s
[CV 4/5] END ....C=1, epsilon=0.01, kernel=rbf;, score=-0.163 total time=   0.
0s
[CV 5/5] END .....C=1, epsilon=0.01, kernel=rbf;, score=0.689 total time=   0.
0s
[CV 1/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.219 total time=   0.
0s
[CV 2/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.426 total time=   0.
0s
[CV 3/5] END ...C=1, epsilon=0.001, kernel=rbf;, score=-0.164 total time=   0.
0s
[CV 4/5] END ...C=1, epsilon=0.001, kernel=rbf;, score=-0.168 total time=   0.
0s
[CV 5/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.690 total time=   0.
0s
[CV 1/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.219 total time=   0.
0s
[CV 2/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.426 total time=   0.
0s
[CV 3/5] END ...C=1, epsilon=0.001, kernel=rbf;, score=-0.164 total time=   0.
0s
[CV 4/5] END ...C=1, epsilon=0.001, kernel=rbf;, score=-0.168 total time=   0.
0s
[CV 5/5] END ....C=1, epsilon=0.001, kernel=rbf;, score=0.690 total time=   0.
0s
[CV 1/5] END ...C=1, epsilon=0.0001, kernel=rbf;, score=0.219 total time=   0.
0s
[CV 2/5] END ...C=1, epsilon=0.0001, kernel=rbf;, score=0.426 total time=   0.
0s
[CV 3/5] END ..C=1, epsilon=0.0001, kernel=rbf;, score=-0.164 total time=   0.
0s
[CV 4/5] END ..C=1, epsilon=0.0001, kernel=rbf;, score=-0.169 total time=   0.
0s
[CV 5/5] END ...C=1, epsilon=0.0001, kernel=rbf;, score=0.690 total time=   0.
0s
[CV 1/5] END ....C=1, epsilon=1e-05, kernel=rbf;, score=0.219 total time=   0.
0s
```

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[CV 2/5] END ....C=1, epsilon=1e-05, kernel=rbf;, score=0.426 total time=   0.
0s
[CV 3/5] END ...C=1, epsilon=1e-05, kernel=rbf;, score=-0.164 total time=   0.
0s
[CV 4/5] END ...C=1, epsilon=1e-05, kernel=rbf;, score=-0.169 total time=   0.
0s
[CV 5/5] END ....C=1, epsilon=1e-05, kernel=rbf;, score=0.690 total time=   0.
0s
[CV 1/5] END ....C=1, epsilon=1e-06, kernel=rbf;, score=0.219 total time=   0.
0s
[CV 2/5] END ....C=1, epsilon=1e-06, kernel=rbf;, score=0.426 total time=   0.
0s
[CV 3/5] END ...C=1, epsilon=1e-06, kernel=rbf;, score=-0.164 total time=   0.
0s
[CV 4/5] END ...C=1, epsilon=1e-06, kernel=rbf;, score=-0.169 total time=   0.
0s
[CV 5/5] END ....C=1, epsilon=1e-06, kernel=rbf;, score=0.690 total time=   0.
0s
[CV 1/5] END .......C=5, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .......C=5, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END .......C=5, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .......C=5, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .......C=5, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .......C=5, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .......C=5, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END .......C=5, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .......C=5, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .......C=5, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ........C=5, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END ........C=5, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END .......C=5, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END ........C=5, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END .......C=5, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ......C=5, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ......C=5, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END ......C=5, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ......C=5, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ......C=5, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END .....C=5, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END .....C=5, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END ....C=5, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END .....C=5, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END .....C=5, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
```

```
0s
[CV 2/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ...C=5, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ...C=5, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ....C=5, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ...C=5, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ...C=5, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ..C=5, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ...C=5, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ...C=5, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=5, epsilon=1e-05, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ....C=5, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ...C=5, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ....C=5, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ....C=5, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=5, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ....C=5, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ...C=5, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ....C=5, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ....C=5, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ......C=10, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ......C=10, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ......C=10, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ......C=10, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ......C=10, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ......C=10, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ......C=10, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ......C=10, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ......C=10, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ......C=10, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
```

```
[CV 1/5] END .......C=10, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END .......C=10, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END ......C=10, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END .......C=10, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END ......C=10, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END .....C=10, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END .....C=10, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END .....C=10, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END .....C=10, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END .....C=10, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ....C=10, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ....C=10, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END ...C=10, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ....C=10, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ....C=10, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ..C=10, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
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0s
[CV 5/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ..C=10, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ...C=10, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=10, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=10, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=10, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ..C=10, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=10, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
0s
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[CV 3/5] END ..C=10, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ...C=10, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ...C=10, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
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0s
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0s
[CV 2/5] END ...C=10, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ..C=10, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ...C=10, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ...C=10, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
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0s
[CV 3/5] END .....C=15, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END .....C=15, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
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[CV 5/5] END .....C=15, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ....C=15, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ....C=15, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END ...C=15, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ....C=15, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ....C=15, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ...C=15, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ...C=15, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END ..C=15, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ...C=15, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
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[CV 2/5] END ...C=15, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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[CV 2/5] END ..C=15, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
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0s
[CV 4/5] END ..C=15, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=15, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
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[CV 2/5] END ...C=15, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
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[CV 4/5] END ...C=15, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
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0s
[CV 4/5] END .....C=100, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=100, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
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0s
[CV 4/5] END .....C=100, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=100, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ......C=100, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END ......C=100, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END .....C=100, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END ......C=100, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
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0s
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0s
[CV 2/5] END ....C=100, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END ....C=100, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ....C=100, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ....C=100, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ...C=100, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ...C=100, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
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0s
[CV 4/5] END ...C=100, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ...C=100, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=100, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
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[CV 4/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=100, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=100, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=100, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=100, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END .C=100, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
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[CV 5/5] END .C=100, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END ..C=100, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=100, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=100, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
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[CV 5/5] END ..C=100, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
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0s
[CV 3/5] END .....C=500, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .....C=500, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=500, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=500, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
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0s
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0s
[CV 5/5] END .....C=500, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
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0s
[CV 2/5] END ......C=500, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END .....C=500, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END ......C=500, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
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0s
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0s
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0s
[CV 4/5] END ....C=500, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ....C=500, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
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0s
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0s
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0s
[CV 4/5] END ...C=500, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
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0s
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0s
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0s
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0s
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[CV 2/5] END .C=500, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
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0s
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0s
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0s
[CV 3/5] END .....C=700, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END ......C=700, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END .....C=700, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ....C=700, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ....C=700, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
```

```
[CV 3/5] END ....C=700, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ....C=700, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ....C=700, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ...C=700, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ...C=700, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END ..C=700, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ...C=700, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ...C=700, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=700, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=700, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=700, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=700, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=700, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=700, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END .C=700, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=700, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=700, epsilon=1e-05, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=700, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=700, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ..C=700, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=700, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=700, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=700, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=700, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ..C=700, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=700, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .....C=800, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .....C=800, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
```

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0s
[CV 3/5] END .....C=800, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END .....C=800, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=800, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=800, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END .....C=800, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
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0s
[CV 4/5] END .....C=800, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END .....C=800, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ......C=800, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END ......C=800, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END .....C=800, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END ......C=800, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END .....C=800, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ....C=800, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ....C=800, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END ....C=800, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ....C=800, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ....C=800, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ...C=800, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ...C=800, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END ..C=800, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ...C=800, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ...C=800, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=800, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
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[CV 5/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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0s
[CV 4/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=800, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=800, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
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[CV 2/5] END .C=800, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=800, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END .C=800, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=800, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=800, epsilon=1e-05, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=800, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=800, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ..C=800, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=800, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ..C=800, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END ..C=800, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END .C=800, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END ..C=800, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END ..C=800, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=1000, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ....C=1000, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
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0s
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0s
[CV 5/5] END ....C=1000, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ....C=1000, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ....C=1000, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
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0s
[CV 4/5] END ....C=1000, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=1000, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=1000, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END .....C=1000, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END ....C=1000, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END .....C=1000, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END ....C=1000, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ...C=1000, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ...C=1000, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
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[CV 3/5] END ...C=1000, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ...C=1000, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ...C=1000, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ..C=1000, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
```

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0s
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[CV 3/5] END .C=1000, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ..C=1000, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ..C=1000, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1000, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1000, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1000, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END C=1000, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END C=1000, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
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0.0s
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0s
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0s
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[CV 2/5] END .C=1000, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
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[CV 5/5] END .C=1000, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1000, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1000, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1000, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
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[CV 5/5] END .C=1000, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
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[CV 2/5] END ....C=1200, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=1200, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ....C=1200, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=1200, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
```

```
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[CV 2/5] END ....C=1200, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=1200, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ....C=1200, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=1200, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=1200, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END .....C=1200, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END ....C=1200, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END .....C=1200, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END ....C=1200, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ...C=1200, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ...C=1200, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END ...C=1200, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ...C=1200, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ...C=1200, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ..C=1200, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ..C=1200, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END .C=1200, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ..C=1200, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
[CV 5/5] END ..C=1200, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1200, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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0s
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0s
[CV 4/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1200, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END C=1200, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END C=1200, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1200, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=
0.0s
[CV 4/5] END C=1200, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END C=1200, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
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0s
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0s
[CV 2/5] END .C=1200, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1200, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
0s
[CV 4/5] END .C=1200, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1200, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1200, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1200, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1200, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
0s
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0s
[CV 5/5] END .C=1200, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
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0s
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0s
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0s
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0s
[CV 4/5] END ....C=1400, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=1400, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=1400, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END .....C=1400, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END ....C=1400, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END .....C=1400, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
0s
[CV 5/5] END ....C=1400, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
0s
[CV 1/5] END ...C=1400, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
0s
[CV 2/5] END ...C=1400, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
0s
[CV 3/5] END ...C=1400, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
0s
[CV 4/5] END ...C=1400, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
0s
[CV 5/5] END ...C=1400, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
0s
[CV 1/5] END ..C=1400, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
0s
[CV 2/5] END ..C=1400, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
0s
[CV 3/5] END .C=1400, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
0s
[CV 4/5] END ..C=1400, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
0s
```

```
[CV 5/5] END ..C=1400, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1400, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
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[CV 4/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
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[CV 5/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1400, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1400, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END C=1400, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END C=1400, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1400, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=
0.0s
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[CV 5/5] END C=1400, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1400, epsilon=1e-05, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1400, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
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[CV 1/5] END .C=1400, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END .C=1400, epsilon=1e-06, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1400, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
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[CV 4/5] END .C=1400, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1400, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END ....C=1600, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 2/5] END ....C=1600, epsilon=3, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=1600, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ....C=1600, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
0s
[CV 5/5] END ....C=1600, epsilon=3, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END ....C=1600, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
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[CV 2/5] END ....C=1600, epsilon=2, kernel=rbf;, score=-0.318 total time=   0.
0s
[CV 3/5] END ....C=1600, epsilon=2, kernel=rbf;, score=-5.771 total time=   0.
0s
[CV 4/5] END ....C=1600, epsilon=2, kernel=rbf;, score=-0.000 total time=   0.
```

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0s
[CV 5/5] END ....C=1600, epsilon=2, kernel=rbf;, score=-1.025 total time=   0.
0s
[CV 1/5] END .....C=1600, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
0s
[CV 2/5] END .....C=1600, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
0s
[CV 3/5] END ....C=1600, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
0s
[CV 4/5] END .....C=1600, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
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[CV 5/5] END ....C=1600, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
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[CV 1/5] END ...C=1600, epsilon=0.1, kernel=rbf;, score=0.348 total time=   0.
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[CV 2/5] END ...C=1600, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
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[CV 3/5] END ...C=1600, epsilon=0.1, kernel=rbf;, score=0.000 total time=   0.
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[CV 4/5] END ...C=1600, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
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[CV 5/5] END ...C=1600, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
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[CV 1/5] END ..C=1600, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
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[CV 2/5] END ..C=1600, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
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[CV 3/5] END .C=1600, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
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[CV 4/5] END ..C=1600, epsilon=0.01, kernel=rbf;, score=0.079 total time=   0.
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[CV 5/5] END ..C=1600, epsilon=0.01, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1600, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1600, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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[CV 4/5] END .C=1600, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
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[CV 1/5] END ....C=1800, epsilon=3, kernel=rbf;, score=-0.000 total time=   0.
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[CV 3/5] END ....C=1800, epsilon=3, kernel=rbf;, score=-5.771 total time=   0.
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[CV 1/5] END .....C=1800, epsilon=1, kernel=rbf;, score=0.153 total time=   0.
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[CV 2/5] END .....C=1800, epsilon=1, kernel=rbf;, score=0.211 total time=   0.
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[CV 3/5] END ....C=1800, epsilon=1, kernel=rbf;, score=-1.484 total time=   0.
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[CV 4/5] END .....C=1800, epsilon=1, kernel=rbf;, score=0.248 total time=   0.
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[CV 5/5] END ....C=1800, epsilon=1, kernel=rbf;, score=-0.171 total time=   0.
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[CV 2/5] END ...C=1800, epsilon=0.1, kernel=rbf;, score=0.488 total time=   0.
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[CV 4/5] END ...C=1800, epsilon=0.1, kernel=rbf;, score=0.109 total time=   0.
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[CV 5/5] END ...C=1800, epsilon=0.1, kernel=rbf;, score=0.703 total time=   0.
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[CV 1/5] END ..C=1800, epsilon=0.01, kernel=rbf;, score=0.343 total time=   0.
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[CV 2/5] END ..C=1800, epsilon=0.01, kernel=rbf;, score=0.507 total time=   0.
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[CV 3/5] END .C=1800, epsilon=0.01, kernel=rbf;, score=-0.015 total time=   0.
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[CV 1/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1800, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
```

```
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[CV 4/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
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[CV 5/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1800, epsilon=0.001, kernel=rbf;, score=-0.022 total time=   0.
0s
[CV 4/5] END .C=1800, epsilon=0.001, kernel=rbf;, score=0.077 total time=   0.
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[CV 1/5] END C=1800, epsilon=0.0001, kernel=rbf;, score=0.342 total time=   0.
0s
[CV 2/5] END C=1800, epsilon=0.0001, kernel=rbf;, score=0.508 total time=   0.
0s
[CV 3/5] END C=1800, epsilon=0.0001, kernel=rbf;, score=-0.023 total time=
0.0s
[CV 4/5] END C=1800, epsilon=0.0001, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END C=1800, epsilon=0.0001, kernel=rbf;, score=0.725 total time=   0.
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[CV 1/5] END .C=1800, epsilon=1e-05, kernel=rbf;, score=0.342 total time=   0.
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[CV 2/5] END .C=1800, epsilon=1e-05, kernel=rbf;, score=0.508 total time=   0.
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[CV 3/5] END C=1800, epsilon=1e-05, kernel=rbf;, score=-0.023 total time=   0.
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[CV 4/5] END .C=1800, epsilon=1e-05, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1800, epsilon=1e-05, kernel=rbf;, score=0.725 total time=   0.
0s
[CV 1/5] END .C=1800, epsilon=1e-06, kernel=rbf;, score=0.342 total time=   0.
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[CV 3/5] END C=1800, epsilon=1e-06, kernel=rbf;, score=-0.023 total time=   0.
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[CV 4/5] END .C=1800, epsilon=1e-06, kernel=rbf;, score=0.077 total time=   0.
0s
[CV 5/5] END .C=1800, epsilon=1e-06, kernel=rbf;, score=0.725 total time=   0.
0s
```

Out[21]:
```
GridSearchCV(estimator=SVR(),
             param_grid={'C': [0.001, 0.01, 0.1, 1, 5, 10, 15, 100, 500, 700,
                               800, 1000, 1200, 1400, 1600, 1800],
                         'epsilon': [3, 2, 1, 0.1, 0.01, 0.001, 0.001, 0.0001,
                                     1e-05, 1e-06],
                         'kernel': ['rbf']},
             verbose=3)
```

In [22]:
```
print("best parameters are:",grid.best_params_)
print("Best Model is:",grid.best_estimator_)
```

```
best parameters are: {'C': 5, 'epsilon': 0.1, 'kernel': 'rbf'}
Best Model is: SVR(C=5)
```

In [43]:
```
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import LeaveOneOut
loo = LeaveOneOut()

print("The number of splits are:",loo.get_n_splits(X))

from sklearn.model_selection import KFold
crossvalidation = KFold(n_splits=27, random_state=None, shuffle=False)
```

```
scores = cross_val_score(svr, X_t, Y, scoring="neg_mean_absolute_error", cv=c
print("Tha MAE scores for each fold is",scores)

print("Folds: " + str(len(scores)) + ", Mean of MAE: " + str(n.mean(n.abs(sco
```

```
The number of splits are: 27
Tha MAE scores for each fold is [-2.05043575 -0.47095233 -1.10119686 -4.839290
62 -4.29022339 -6.95748547
 -1.25107088 -1.54970995 -2.02733515 -0.08864091 -4.01121734 -6.2656112
 -4.47172833 -5.74346537 -4.78929681 -0.9477793  -4.97144663 -5.06185
 -0.48986117 -2.04441904 -5.51346627 -7.09329923 -2.84800217 -0.10182056
 -3.03674066 -4.15980994 -1.8713179 ]
Folds: 27, Mean of MAE: 3.261017527246278, STD: 2.1310503469788156
```

In [ ]:
```
COMMON PART FOR ANY RESPONSE!!
```

In [51]:
```
import time
```

In [57]:
```
x=svr.predict(Sx.transform([[24,190,5.5,17,17]])) #taking the prediction at f
x=Sy.inverse_transform(x.reshape(-1, 1))

minm=[x]
params=[0]


start = time.time_ns()     #record start time

for v in df_new['V'].unique():
    for i in df_new['I'].unique():
        for ws in df_new['WS'].unique():
            for npd in df_new['NPD'].unique():
                for g in df_new['G'].unique():

                    y_pref=svr.predict(Sx.transform([[v,i,ws,npd,g]]))
                    y_pref=Sy.inverse_transform(y_pref.reshape(-1, 1))

                    if y_pref<minm[0]:
                        minm.pop(0)        #Removes first element from minm[]
                        minm.append(y_pref)

                        x=[v,i,ws,npd,g]    #Stores current optima_params in
                        params[0]=x

end = time.time_ns()    #Record end time!!

print("The optimal response is:",minm)
print("At Optimal Paramteres:",params)

t1=(end-start)/1000000000
print("Time Taken:",t1,"seconds")
```

```
The optimal response is: [array([[25.91303103]])]
At Optimal Paramteres: [[24, 200, 6, 19, 19]]
Time Taken: 1.031723 seconds
```

ALgo order:V,I,WS,NPD,G Range: V(24-28),I(190-230),WS(5-7),NPD(17-21),G(17-21) corr coef: I=0.49;NPD=-0.46;V=0.4;G=0.11;WS=-0.10 [24, 200, 6, 19, 19]

ZOOM IN!!

In [61]:
```
x=svr.predict(Sx.transform([[24,190,5.5,17,17]])) #taking the prediction at f
x=Sy.inverse_transform(x.reshape(-1, 1))

minm=[x]
param=[0]
```

```
start = time.time_ns()      #record start time

for i in range(195,206):                        # rigorous search on currents!!
    for ws in [5.6,5.8,6,6.2,6.4]:   #weak corr with ws and hence narrow band
        for npd in [18.2,18.4,18.6,18.7,18.8,19,19.2,18.4,19.6,19.8]:   # pow
            for g in [19]:                    #corr is very low for dilution!!

                    y_pref=svr.predict(Sx.transform([[24,i,ws,npd,g]]))    #v
                    y_pref=Sy.inverse_transform(y_pref.reshape(-1, 1))

                    if y_pref<minm[0]:
                        minm.pop(0)
                        minm.append(y_pref)

                        x=[24,i,ws,npd,g]
                        param[0]=x

end = time.time_ns()        #Record end time..!!

t2=(end-start)/1000000000

print("After refined search optimal prediction (response is):",minm)
print("At optimal Parameters:",param)
print("Time Taken(Step2 ZOOM IN):",t2,"seconds")

print("Total time taken by our search algorithm",t1+t2,"seconds")
```

```
After refined search optimal prediction (response is): [array([[25.3907700
7]])]
At optimal Parameters: [[24, 203, 6, 19.6, 19]]
Time Taken(Step2 ZOOM IN): 0.183462 seconds
Total time taken by our search algorithm 1.215185 seconds
```

2:Second Step..!!

In [42]:

```
def predict(v, i, ws, npd, g):
    y_pref=svr.predict(Sx.transform([[v,i,ws,npd,g]]))
    y_pref=Sy.inverse_transform(y_pref.reshape(-1, 1))
    return y_pref

#ZOOMING INTO NARROW BANDS OF PARMETERS.
V = [24]
I = [i for i in range(195,206)]
WS = [5.6,5.8,6,6.2,6.4]     # Relatively weak corr with ws and hence narrow
NPD = [18.2,18.4,18.6,18.7,18.8,19,19.2,18.4,19.6,19.8]   # Powerfully corell
G = [19]     # corr is very low for dilution!!

combinations = itertools.product(V, I, WS, NPD, G)
lowest_prediction = float('inf')
lowest_combo = None

start = time.time_ns()
for combo in combinations:
    v, i, ws, npd, g = combo
    prediction = predict(v, i, ws, npd, g)
    if prediction < lowest_prediction:
        lowest_prediction = prediction
        lowest_combo = combo
end = time.time_ns()

print(f"Lowest Prediction: {lowest_prediction}")
print(f"Optima_2 at: {lowest_combo}")

t2=(end-start)/1000000000
```

```
print("Time Taken in zoom in:",t2,"seconds")
print("Total Time Taken:",t1+t2,"seconds")
```

```
Lowest Prediction: [[25.39077007]]
Optima_2 at: (24, 203, 6, 19.6, 19)
Time Taken in zoom in: 0.2058 seconds
Total Time Taken: 1.168978 seconds
```

1: First Step..!!

In [39]:

```
import itertools
import time
def predict(v, i, ws, npd, g):    # Function that returns predicted value.
    y_pref=svr.predict(Sx.transform([[v,i,ws,npd,g]]))
    y_pref=Sy.inverse_transform(y_pref.reshape(-1, 1))
    return y_pref

V = df_new['V'].unique()
I = df_new['I'].unique()
WS = df_new['WS'].unique()
NPD = df_new['NPD'].unique()
G = df_new['G'].unique()

combinations = itertools.product(V, I, WS, NPD, G)     #Generate all possible
lowest_prediction = float('inf')       #Initialize variables to track the low
lowest_combo = None                    #corresponding combination which is No

start = time.time_ns()                 #Record start time.
for combo in combinations:            #Iterate over each combination.
    v, i, ws, npd, g = combo

    prediction = predict(v, i, ws, npd, g)   #Makes prediction using optimize

    if prediction < lowest_prediction:   #If the current prediction is lower
        lowest_prediction = prediction
        lowest_combo = combo
end = time.time_ns()       # Record end time.

print(f"Lowest Prediction: {lowest_prediction}")
print(f"Optima_1 at: {lowest_combo}")

t1=(end-start)/1000000000
print("Time Taken:",t1,"seconds")
```

```
Lowest Prediction: [[25.91303103]]
Optima_1 at: (24.0, 200.0, 6.0, 19.0, 19.0)
Time Taken: 0.963178 seconds
```

In [ ]: