Hubert Dębowski, GIN

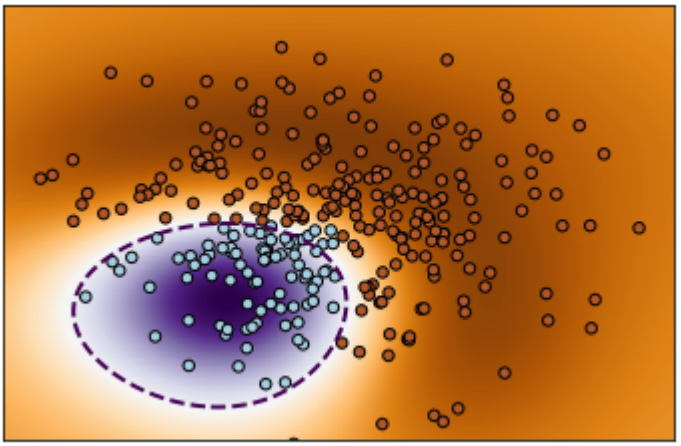
Spis treści:

---

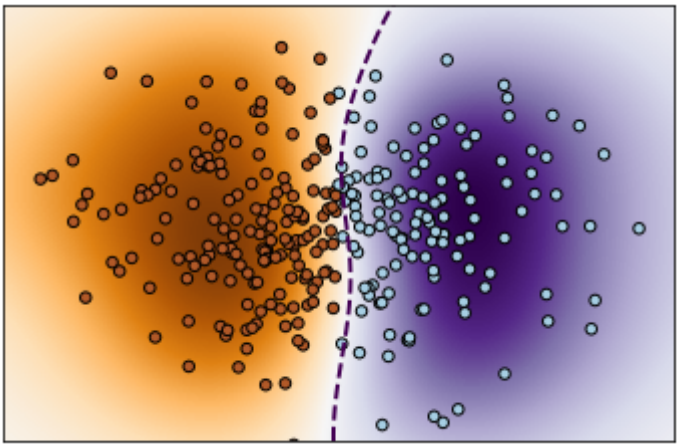
1. SVM SLASSIFY

zadanie 1

- or

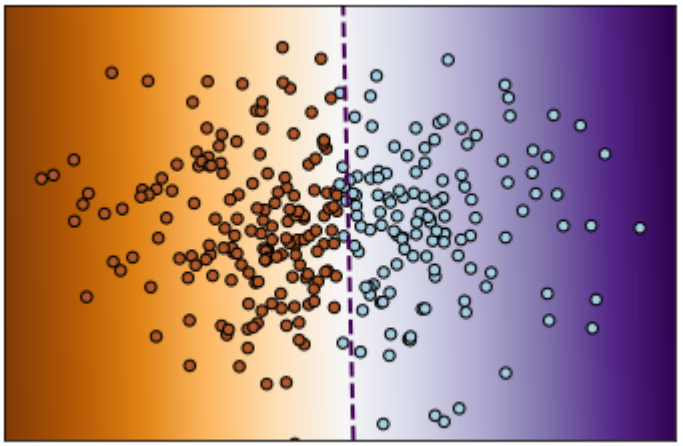


- not

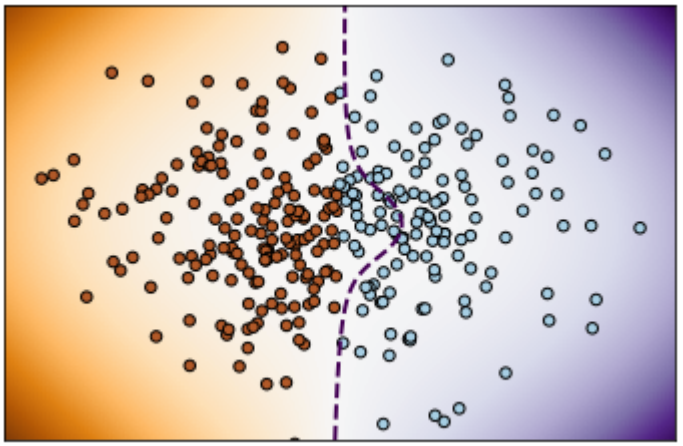


Zadanie 2

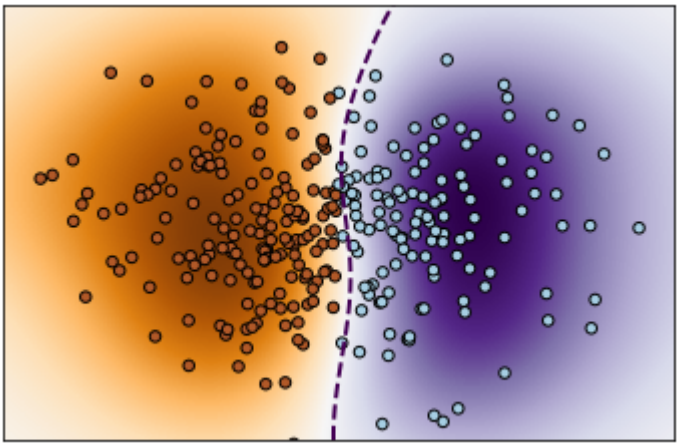
- kernel = 'linear'



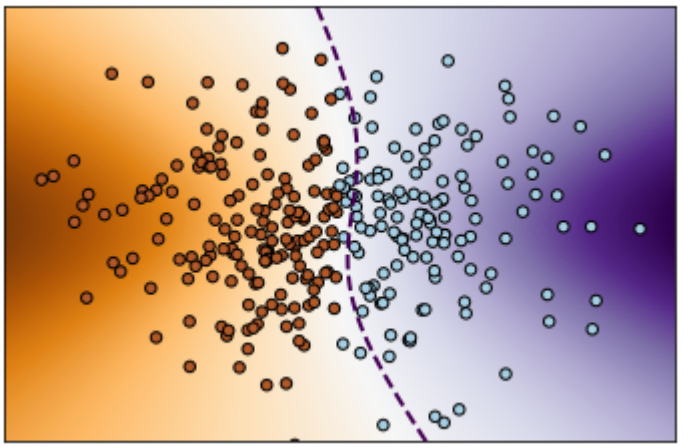
- kernel = 'poly'



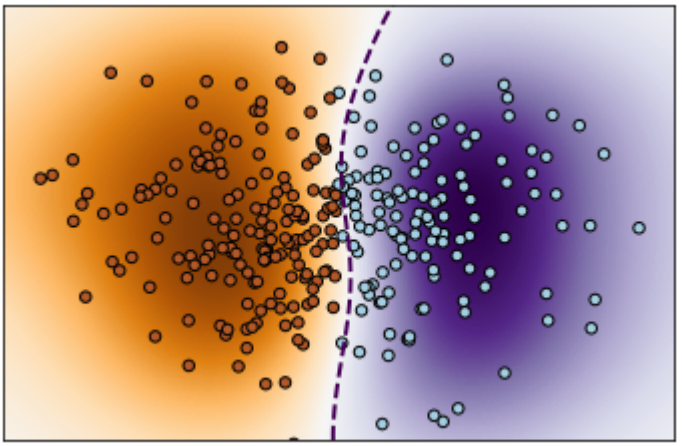
- kernel = 'rbf'



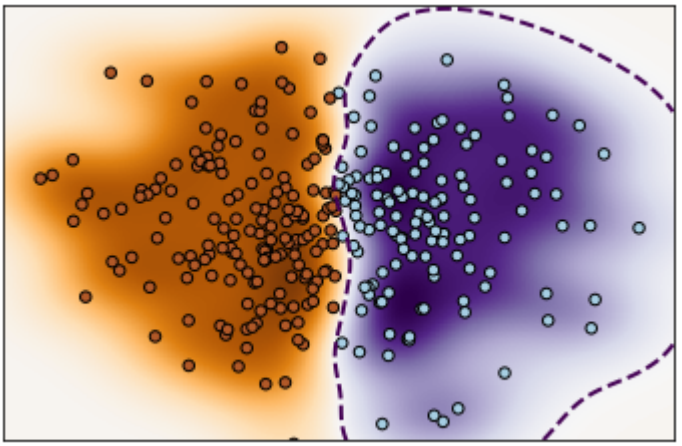
- kernel = 'sigmoid'



- gamma='scale'



- gamma = 3



2. SVM_CLASSIFY_TUNING

Zadanie 2.

- TESTOWY 30%

```
Wyniki uzyskane dla poszczególnych elementów siatki:

0.989 (+/-0.006) for {'C': 1, 'gamma': 0.001, 'kernel': 'rbf'}
0.969 (+/-0.012) for {'C': 1, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 10, 'gamma': 0.001, 'kernel': 'rbf'}
0.986 (+/-0.013) for {'C': 10, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 100, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.014) for {'C': 100, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 1000, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.014) for {'C': 1000, 'gamma': 0.0001, 'kernel': 'rbf'}
0.983 (+/-0.014) for {'C': 1, 'kernel': 'linear'}
0.983 (+/-0.014) for {'C': 10, 'kernel': 'linear'}
0.983 (+/-0.014) for {'C': 100, 'kernel': 'linear'}
0.983 (+/-0.014) for {'C': 1000, 'kernel': 'linear'}

Szczegółowy raport z klasyfikacji:

The model is trained on the full development set.
The scores are computed on the full evaluation set.

              precision    recall  f1-score   support

           0       1.00      1.00      1.00        45
           1       0.98      1.00      0.99        52
           2       1.00      0.98      0.99        53
           3       1.00      1.00      1.00        54
           4       1.00      1.00      1.00        48
           5       0.98      0.96      0.97        57
           6       0.98      1.00      0.99        60
           7       0.98      1.00      0.99        53
           8       1.00      0.98      0.99        61
           9       0.98      0.98      0.98        57

    accuracy                           0.99       540
   macro avg       0.99      0.99      0.99       540
weighted avg       0.99      0.99      0.99       540
```

- TESTOWY 20%

```
0.991 (+/-0.009) for {'C': 1, 'gamma': 0.001, 'kernel': 'rbf'}
0.973 (+/-0.019) for {'C': 1, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.010) for {'C': 10, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.017) for {'C': 10, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.010) for {'C': 100, 'gamma': 0.001, 'kernel': 'rbf'}
0.989 (+/-0.010) for {'C': 100, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.010) for {'C': 1000, 'gamma': 0.001, 'kernel': 'rbf'}
0.989 (+/-0.010) for {'C': 1000, 'gamma': 0.0001, 'kernel': 'rbf'}
0.978 (+/-0.014) for {'C': 1, 'kernel': 'linear'}
0.978 (+/-0.014) for {'C': 10, 'kernel': 'linear'}
0.978 (+/-0.014) for {'C': 100, 'kernel': 'linear'}
0.978 (+/-0.014) for {'C': 1000, 'kernel': 'linear'}

Szczegółowy raport z klasyfikacji:

The model is trained on the full development set.
The scores are computed on the full evaluation set.

              precision    recall  f1-score   support

           0       1.00      1.00      1.00        27
           1       0.97      1.00      0.99        35
           2       1.00      1.00      1.00        36
           3       1.00      1.00      1.00        29
           4       1.00      1.00      1.00        30
           5       0.97      0.97      0.97        40
           6       1.00      1.00      1.00        44
           7       1.00      1.00      1.00        39
           8       1.00      0.97      0.99        39
           9       0.98      0.98      0.98        41

    accuracy                           0.99       360
   macro avg       0.99      0.99      0.99       360
weighted avg       0.99      0.99      0.99       360
```

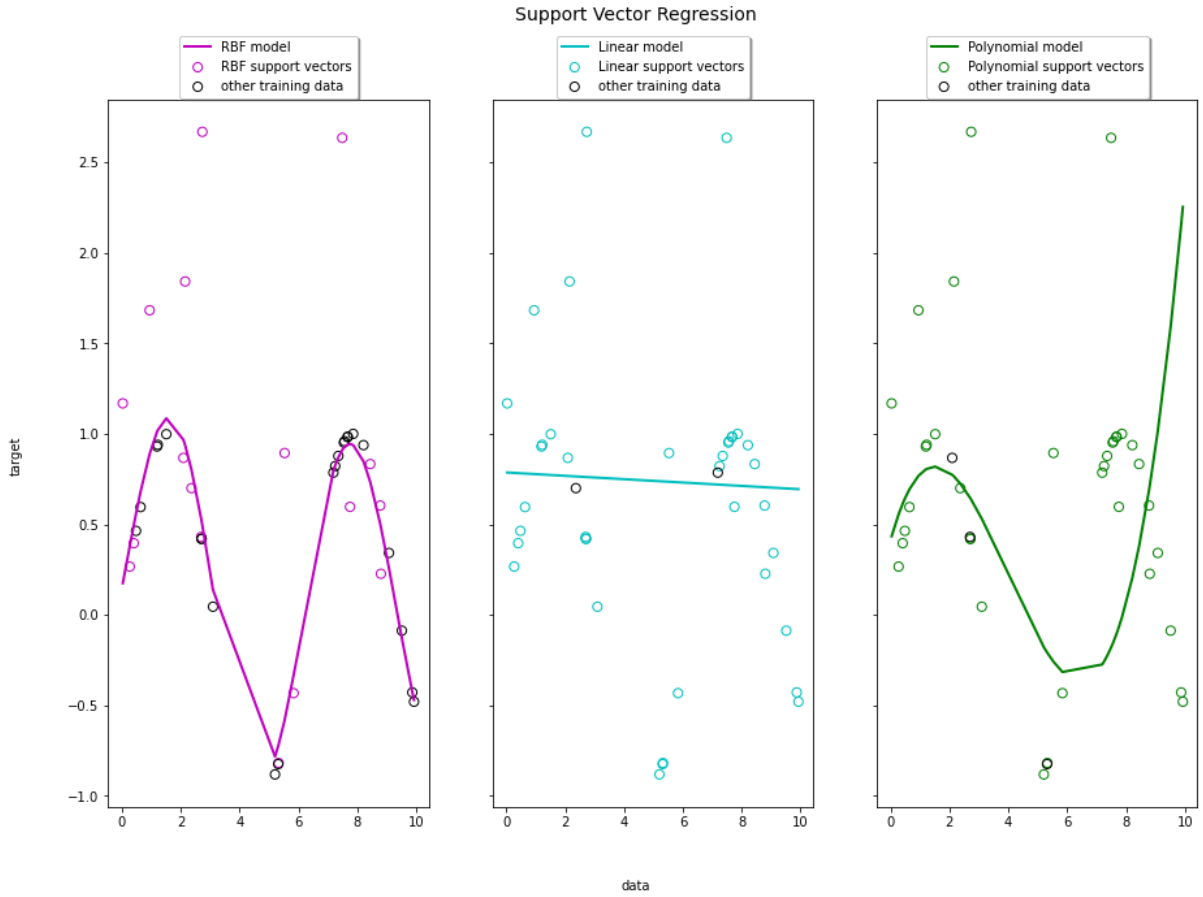
- TESTOWY 10%

```
0.991 (+/-0.007) for {'C': 1, 'gamma': 0.001, 'kernel': 'rbf'}
0.974 (+/-0.010) for {'C': 1, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 10, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.007) for {'C': 10, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 100, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.005) for {'C': 100, 'gamma': 0.0001, 'kernel': 'rbf'}
0.991 (+/-0.006) for {'C': 1000, 'gamma': 0.001, 'kernel': 'rbf'}
0.987 (+/-0.005) for {'C': 1000, 'gamma': 0.0001, 'kernel': 'rbf'}
0.978 (+/-0.010) for {'C': 1, 'kernel': 'linear'}
0.978 (+/-0.010) for {'C': 10, 'kernel': 'linear'}
0.978 (+/-0.010) for {'C': 100, 'kernel': 'linear'}
0.978 (+/-0.010) for {'C': 1000, 'kernel': 'linear'}

Szczegółowy raport z klasyfikacji:

The model is trained on the full development set.
The scores are computed on the full evaluation set.

              precision    recall  f1-score   support

           0       1.00      1.00      1.00        11
           1       0.95      1.00      0.98        20
           2       1.00      1.00      1.00        16
           3       1.00      1.00      1.00        10
           4       1.00      1.00      1.00        10
           5       0.95      1.00      0.98        21
           6       1.00      1.00      1.00        25
           7       1.00      1.00      1.00        20
           8       1.00      0.96      0.98        23
           9       1.00      0.96      0.98        24

    accuracy                           0.99       180
   macro avg       0.99      0.99      0.99       180
weighted avg       0.99      0.99      0.99       180
```

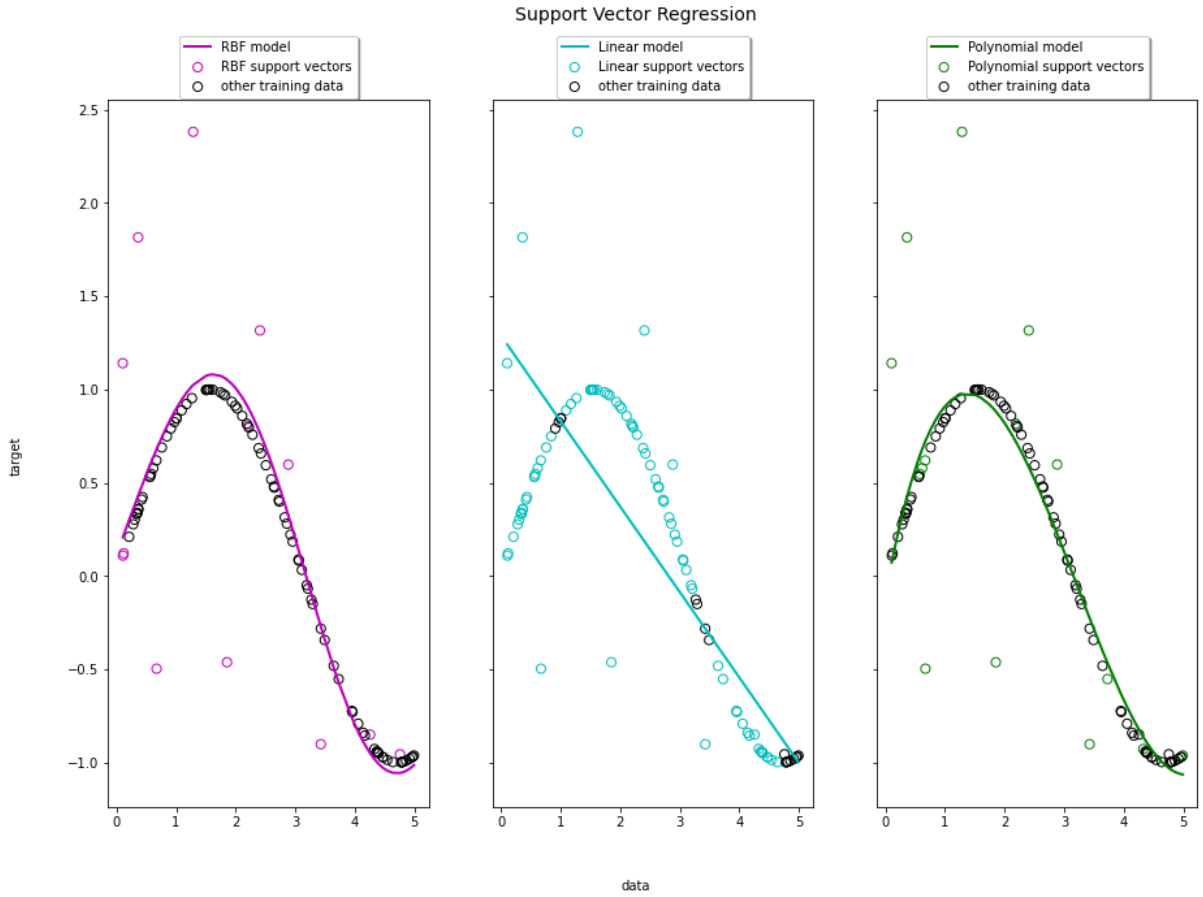
3. SVM_REGRESSION

Zadanie 1

A. Innej wartości determinującej zakres wartości wektora X

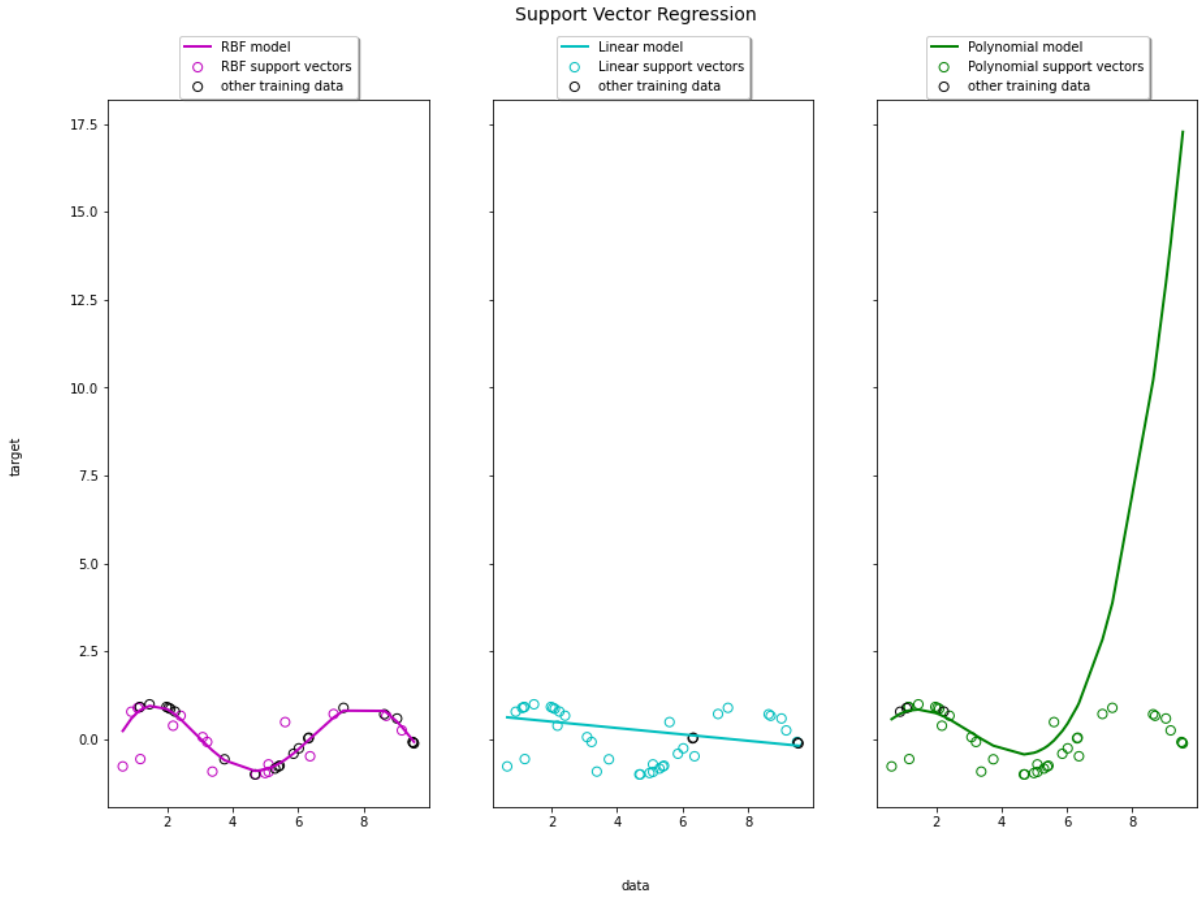


B. Innej liczby wyrazów wektora X - np. 100, 1000, 10000

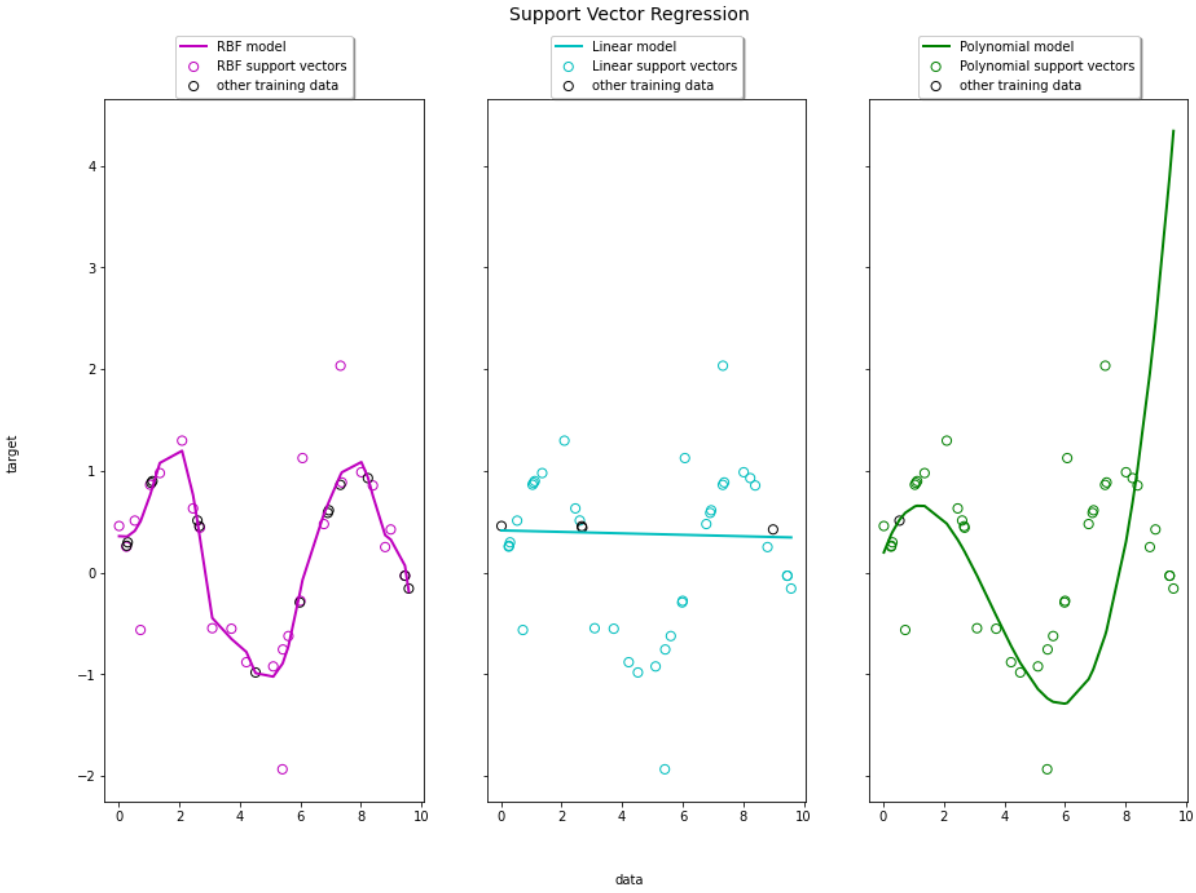


C. Innych wartości parametrów: C, gamma, epsilon, degree i coef0

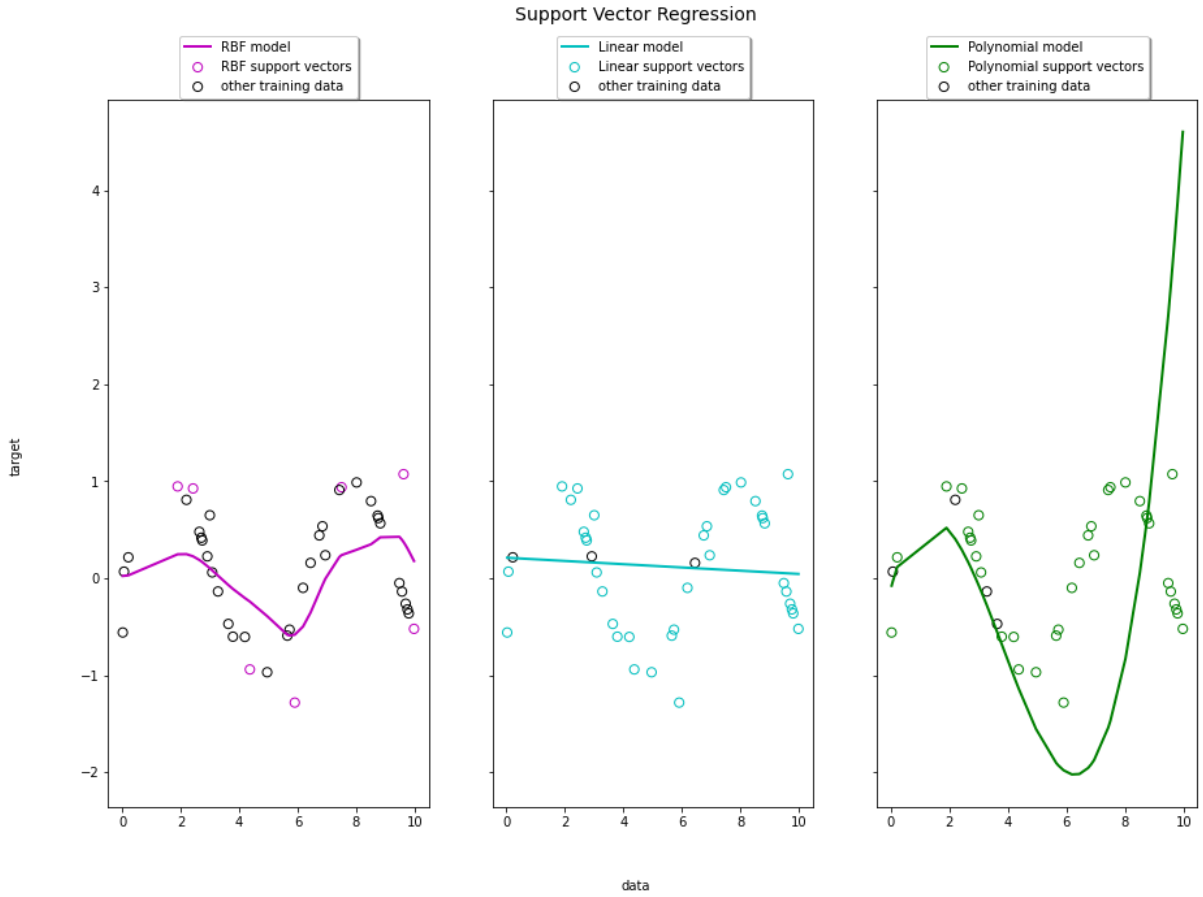
- C =300


Support Vector Regression
RBF model
RBF support vectors
other training data
Linear model
Linear support vectors
other training data
Polynomial model
Polynomial support vectors
other training data
target
data
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
2
4
6
8

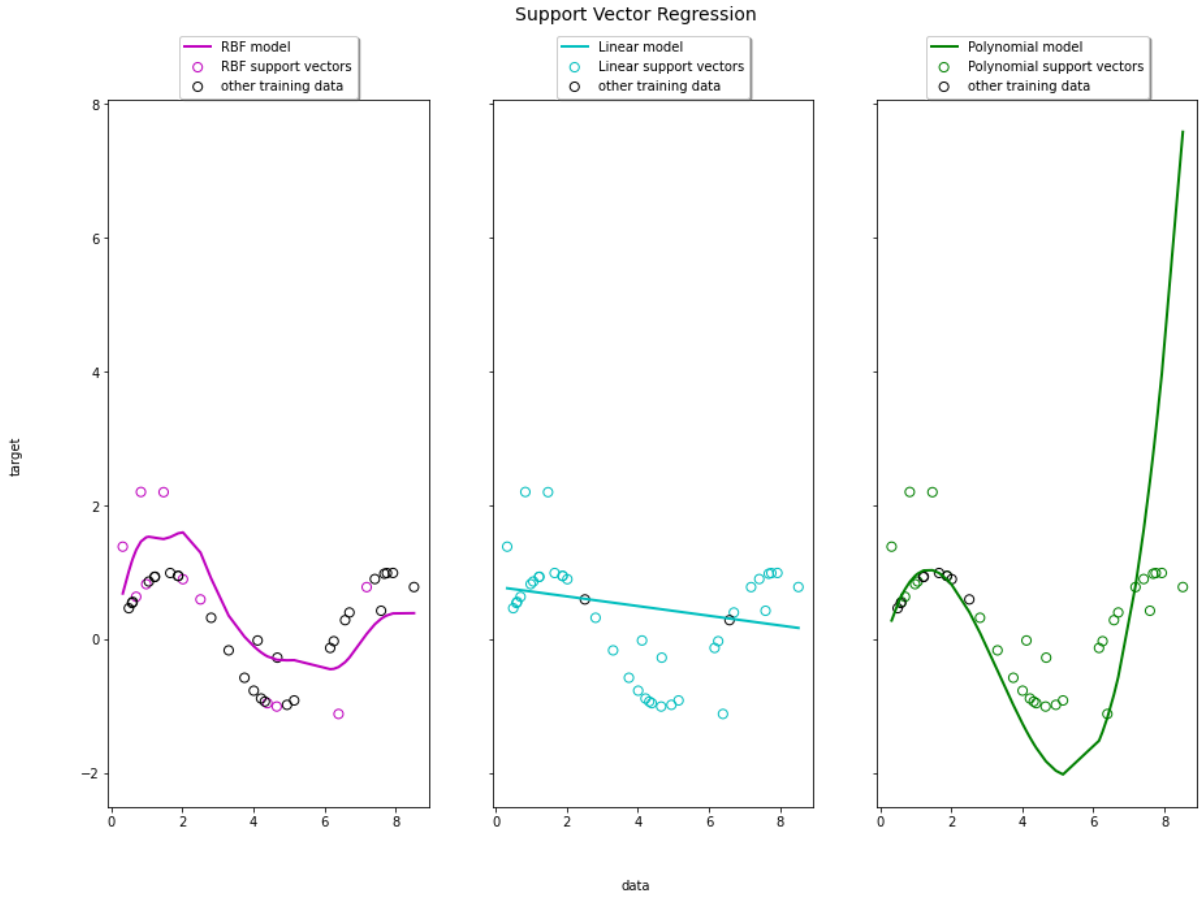
- gamma = 0.9


Support Vector Regression
RBF model
RBF support vectors
other training data
Linear model
Linear support vectors
other training data
Polynomial model
Polynomial support vectors
other training data
target
data

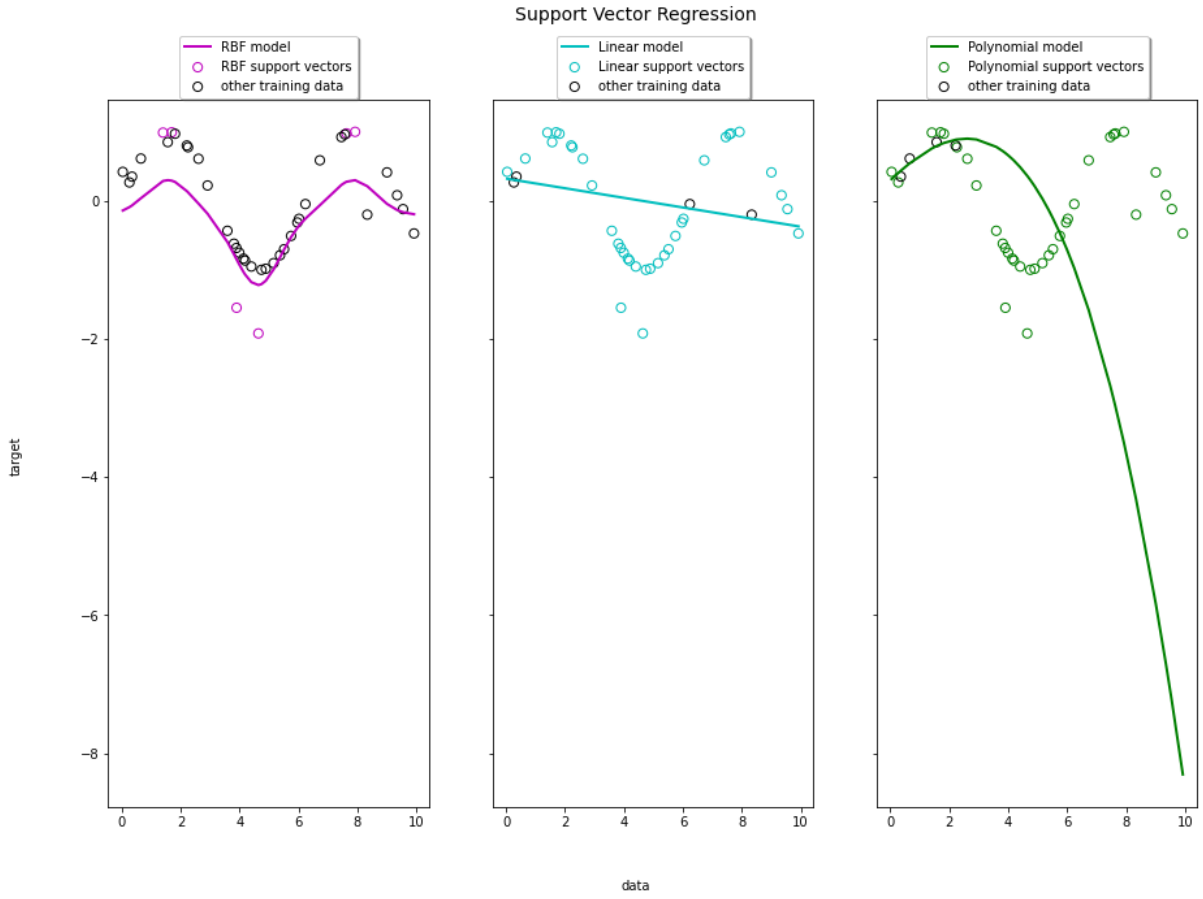
- epsilon=7


Support Vector Regression
RBF model
RBF support vectors
other training data
Linear model
Linear support vectors
other training data
Polynomial model
Polynomial support vectors
other training data
target
data

- degree=3


Support Vector Regression
RBF model
RBF support vectors
other training data
Linear model
Linear support vectors
other training data
Polynomial model
Polynomial support vectors
other training data
target
data

- coef0=6



4. SVM_REGRESSION_TUNING_X_Y

Zadanie 5.

- liniowa

```
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0002009233002565046, 'C': 9.794696670695393}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.00015556761439304722, 'C': 26.694784940343208}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.00012618568830660197, 'C': 300.2461709085549}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0006135907273413176, 'C': 10.865157746525384}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0003944206059437656, 'C': 10.280447320933092}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.00047508101621027984, 'C': 11.483124145435111}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0005590810182512223, 'C': 138.40160965731314}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.000774263682681127, 'C': 85.2964449974102}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0007054802310718645, 'C': 37.720424934169976}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0001788649529057435, 'C': 372.0236681413066}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0003853528593710527, 'C': 9.72720319245054}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0006280291441834253, 'C': 22.9276931286565}
{'C': 100, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0003351602650938841, 'C': 8.588828559546252}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.00024201282647943808, 'C': 8.126619200091946}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
{'kernel': 'linear', 'gamma': 0.0002009233002565046, 'C': 7.376797602527732}
{'C': 10, 'gamma': 0.001, 'kernel': 'linear'}
```

- wielomianowa

```
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0007742636826811277, 'C': 464.15888336127773}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0005462277217684342, 'C': 445.29585099426555}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0008111308307896872, 'C': 97.94696670695396}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0004328761281083057, 'C': 889.0965989529158}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0009326033468832199, 'C': 102.80447320933098}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0003678379771828634, 'C': 727.5483529196225}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0006734150657750821, 'C': 310.8082173869064}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.001, 'C': 179.99285067824763}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0008697490026177834, 'C': 952.750047242729}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0008902150854450384, 'C': 120.52609368708426}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0008497534359086438, 'C': 136.50078065460139}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0006892612104349695, 'C': 633.5804992658248}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0009770099572992256, 'C': 1.3369837418249464}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0004977023564332109, 'C': 404.20958397963057}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0007924828983539169, 'C': 36.18749812411281}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0005462277217684342, 'C': 213.95888713434215}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0009770099572992256, 'C': 162.25952870780873}
{'C': 1000, 'gamma': 0.001, 'kernel': 'poly'}
{'kernel': 'poly', 'gamma': 0.0009326033468832199, 'C': 633.5804992658248}
```