ML HW 5

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Link to colab:
https://colab.research.google.com/drive/1GonvggZZiGl_ysS3T_9Hbdq7o0p_K_Kz#scrollTo=j4hCc2WbsbOL&uniqifier=2

Question 1

a. **Ecv for best regularization parameter**

```
Best Regularization parameter : 100.0
ECV for best Regularization 100.0 is : 0.017297452281477832
```

b. **Ein for selected regularization parameter**

```
Ein for SVM model is : 0.01665598975016014
/usr/local/lib/python3.10/dist-packages/sklearn/uti
  y = column_or_1d(y, warn=True)
```

c. **E_test**

```
Etest for SVM model: 0.5873362445414847
```

E_test in linear model was little bit higher than in SVM. SVM can outperform linear model when data is not linearly separable and auto regularization in SVM leads to better generalization.

Question 2

a. **Ecv for best regularization parameter**

```
Best regularization parameter for poly Transform data : 1.0
ECV for best  regularization parameter: 0.017938477922503582
```

b. **Ein for selected regularization parameter**

```
Ein for poly Transform data: 0.017296604740550947
/usr/local/lib/python3.10/dist-packages/sklearn/uti
  y = column_or_1d(y, warn=True)
```

c. **E_test**

```
Etest for poly Transform data: 0.5873362445414847
```

E_test in both SVM and Linear model are almost similar, but the Test Error signifies here that the model is tending to overfit than generalizing the data.