# Ex7

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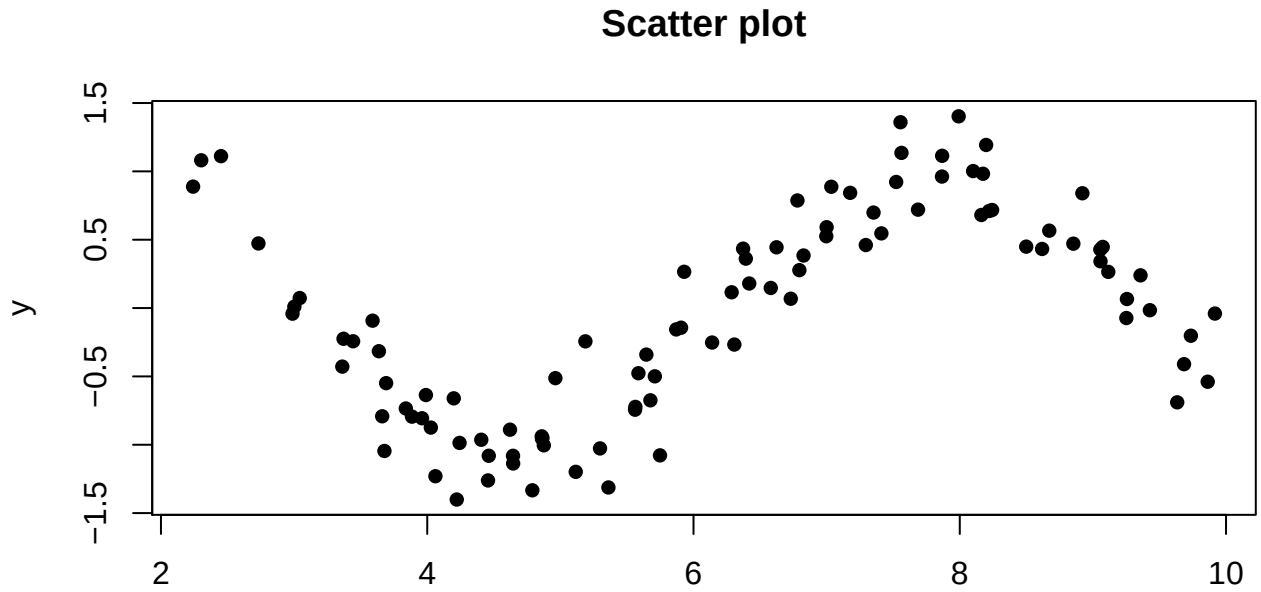
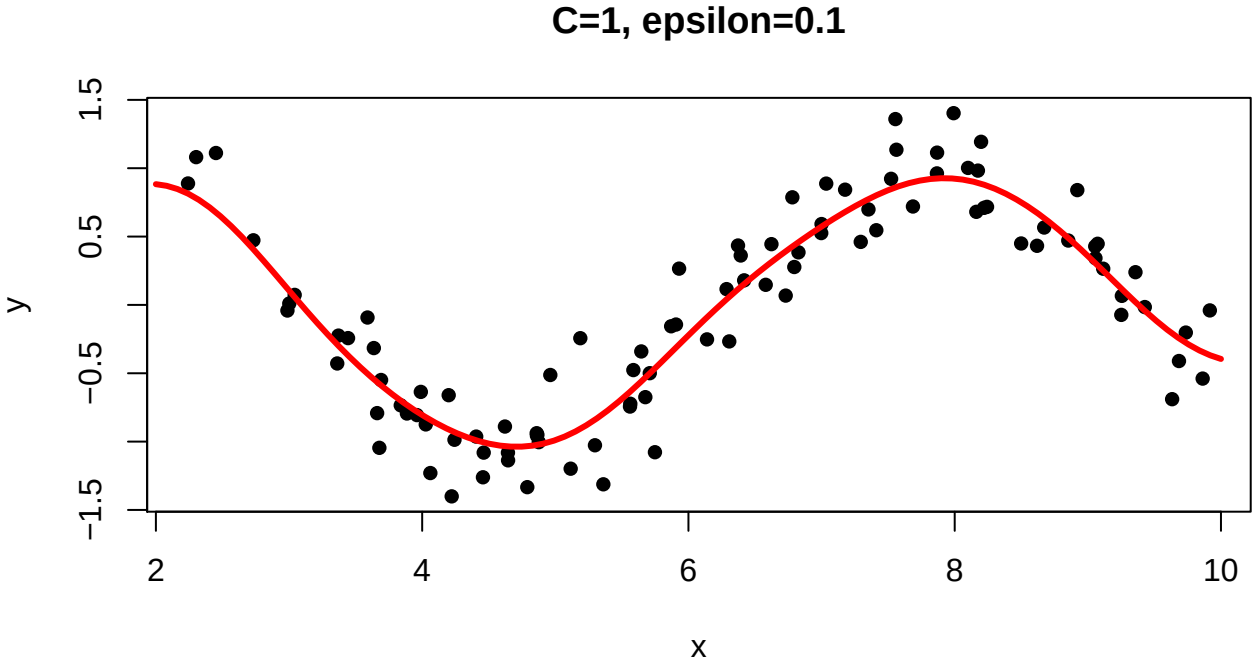
*10/31/2014*

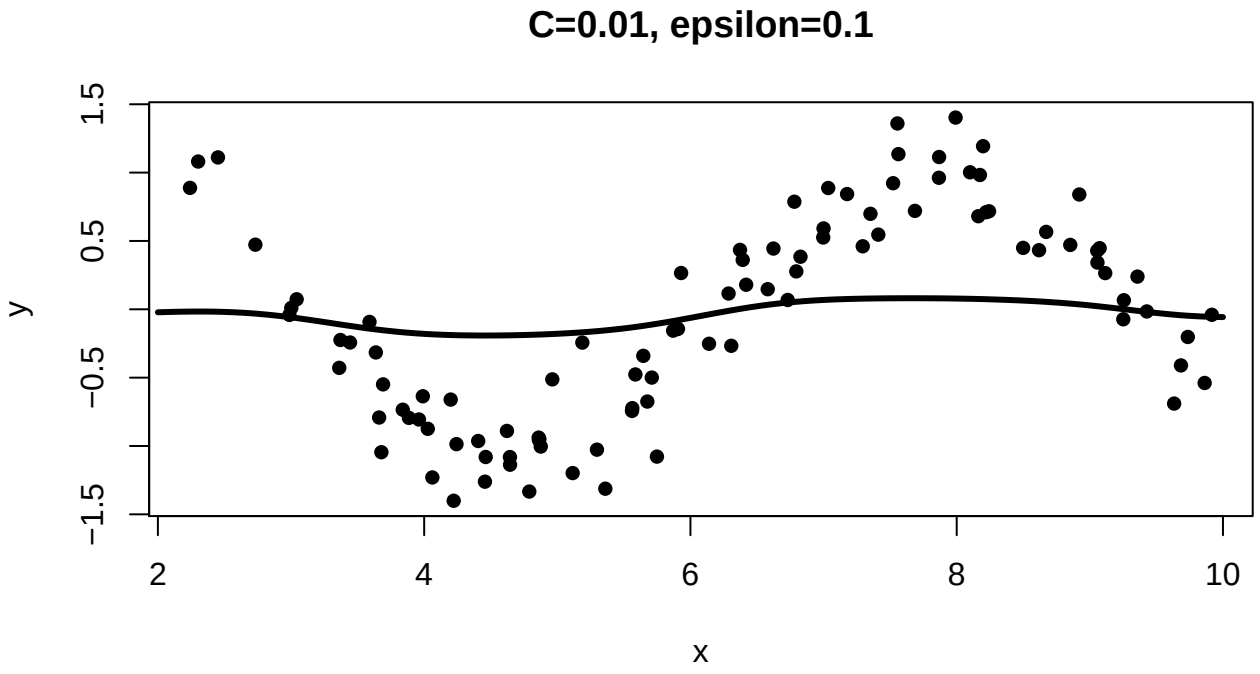



1). a).

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```




```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```




```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
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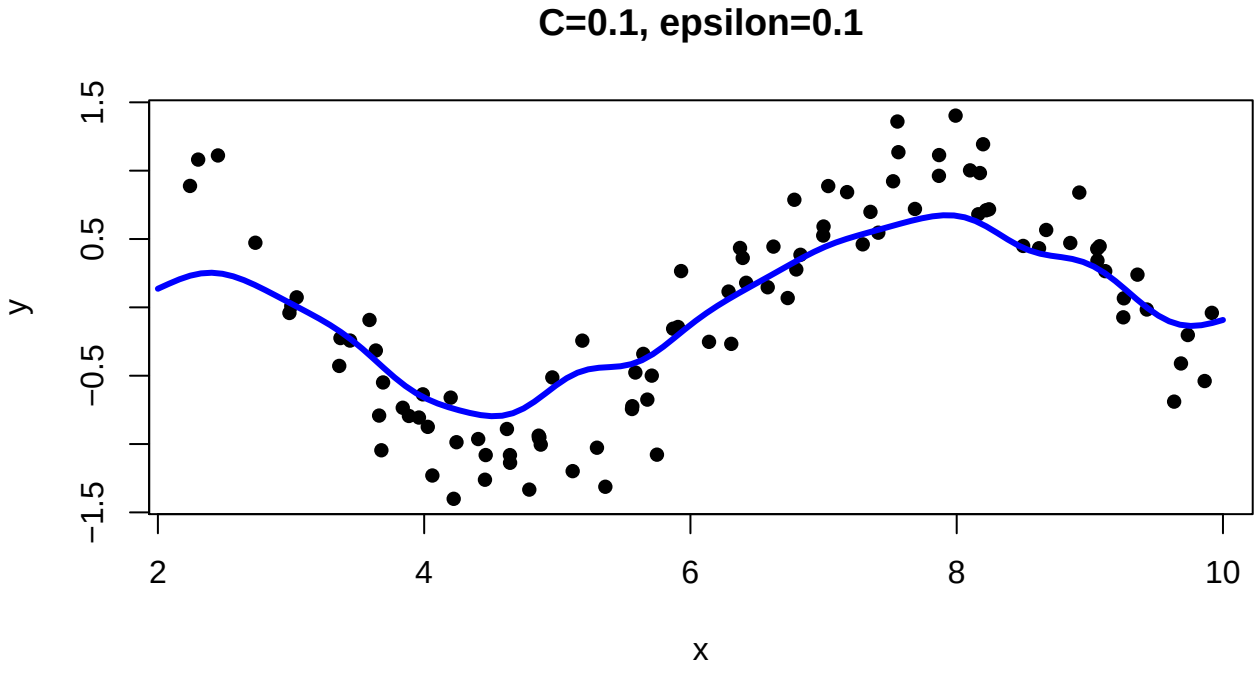
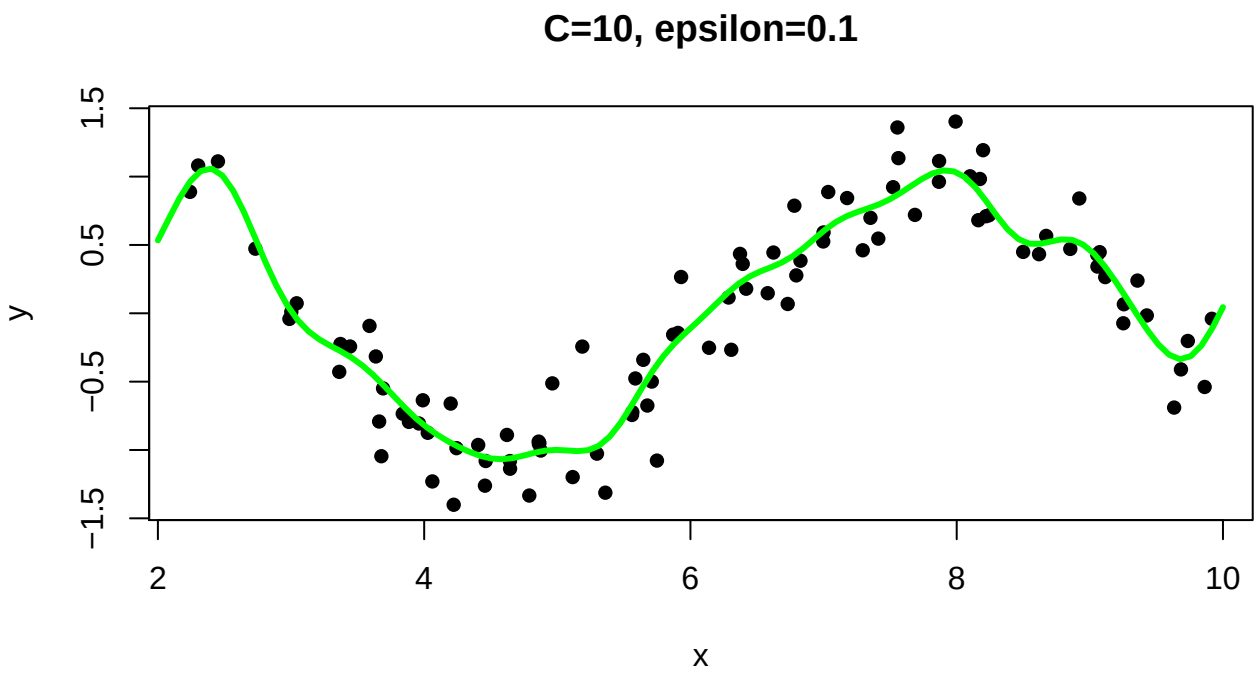
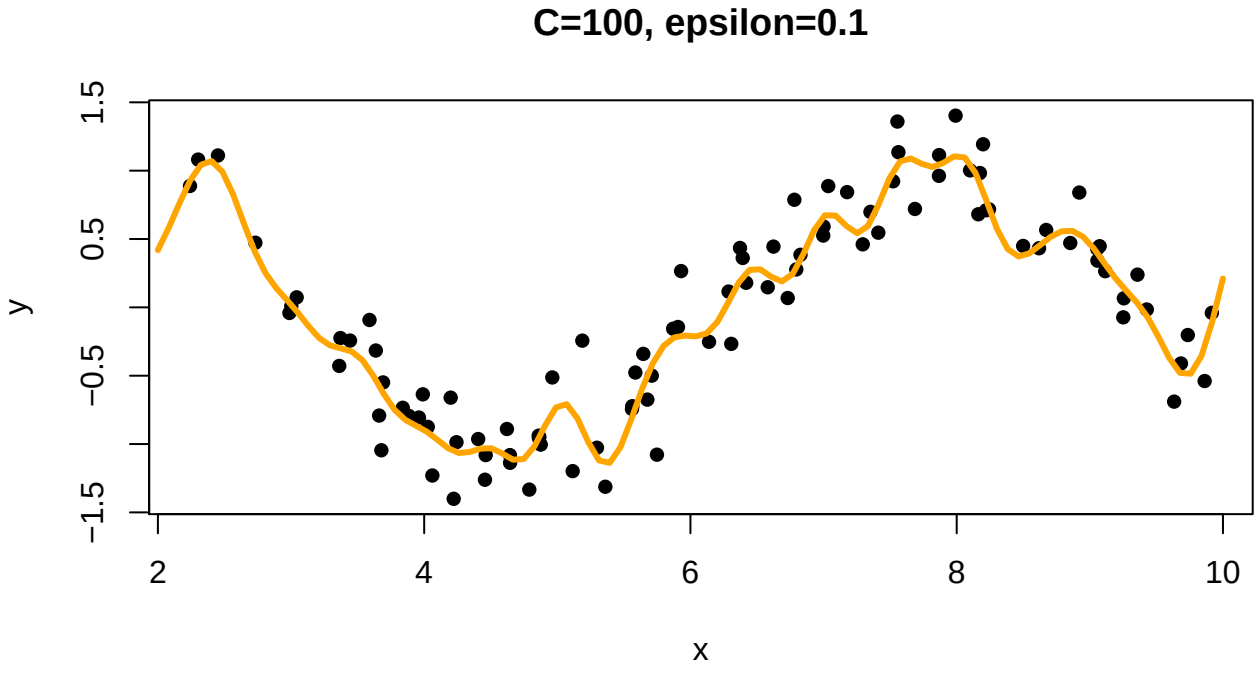


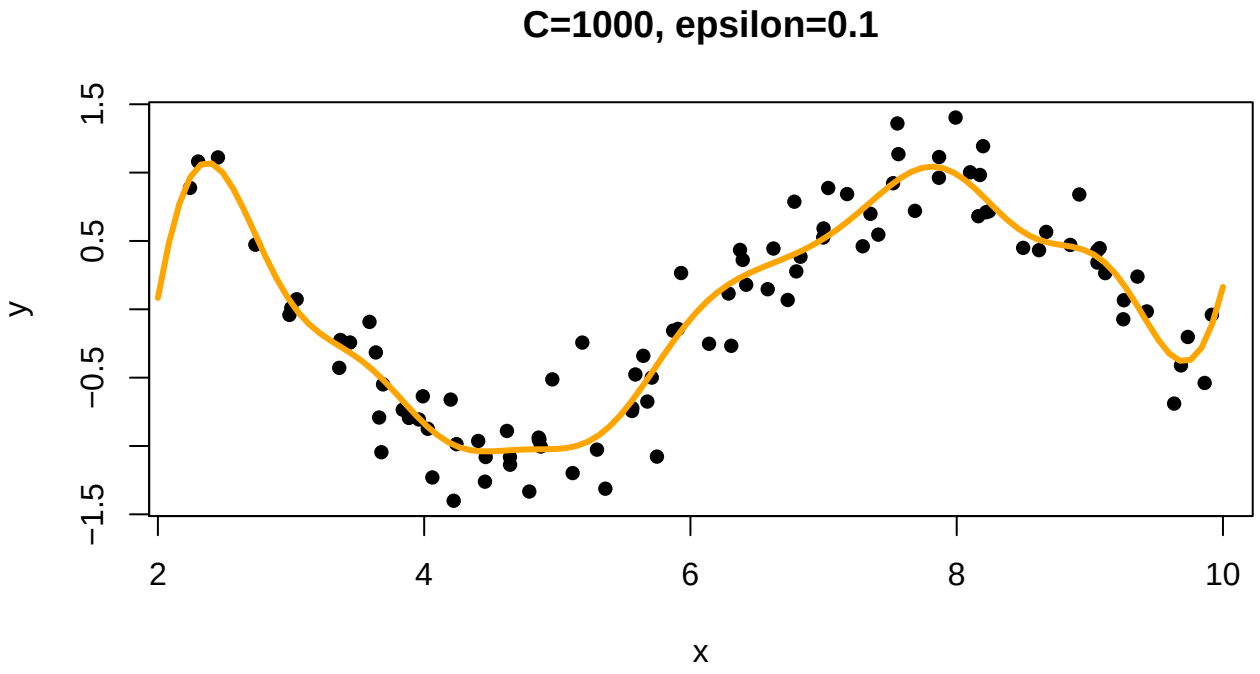

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```



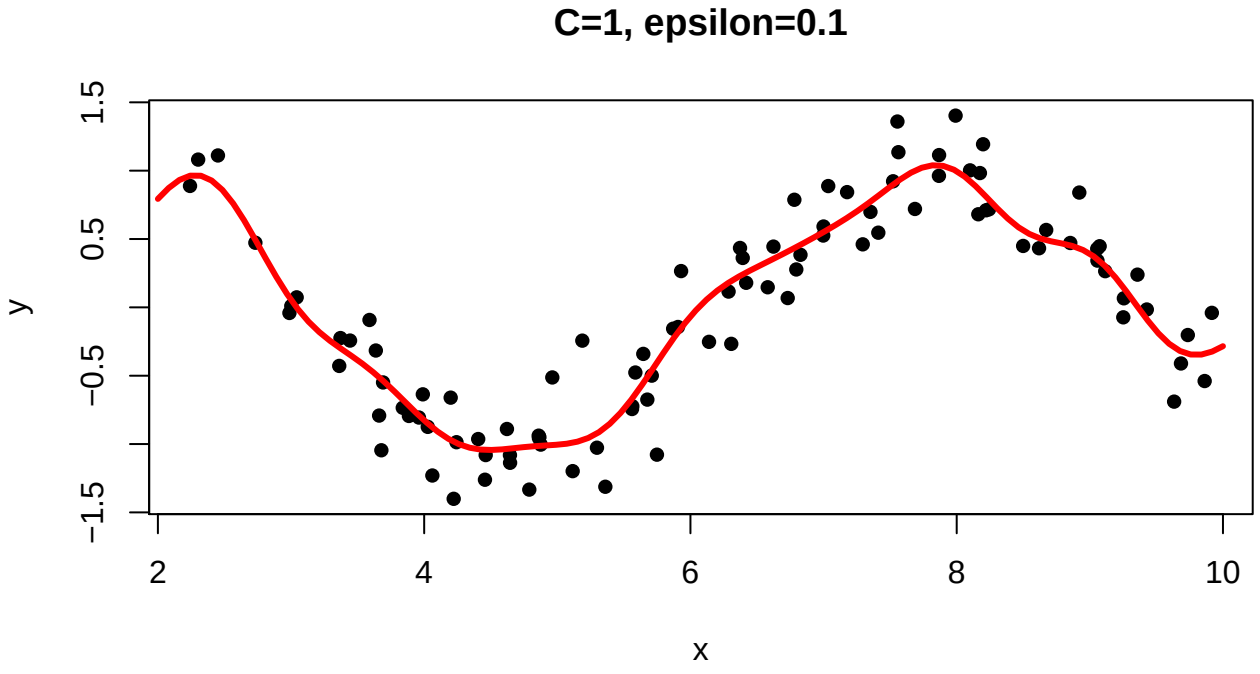

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```



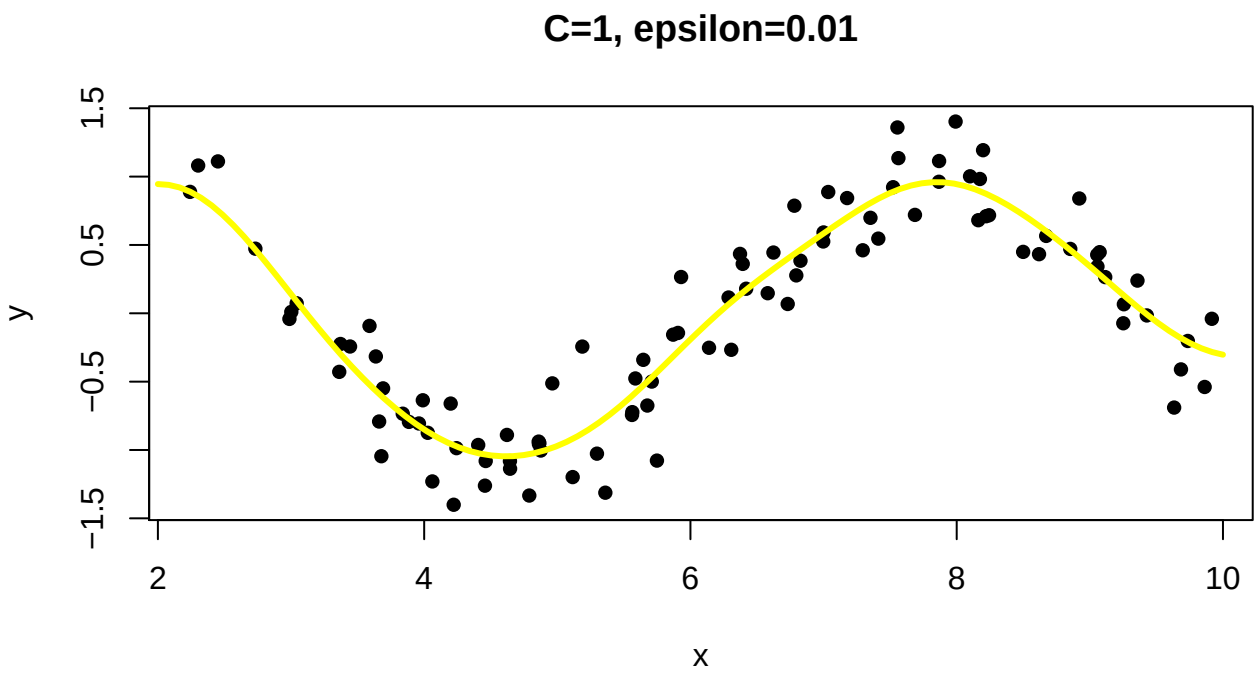

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```



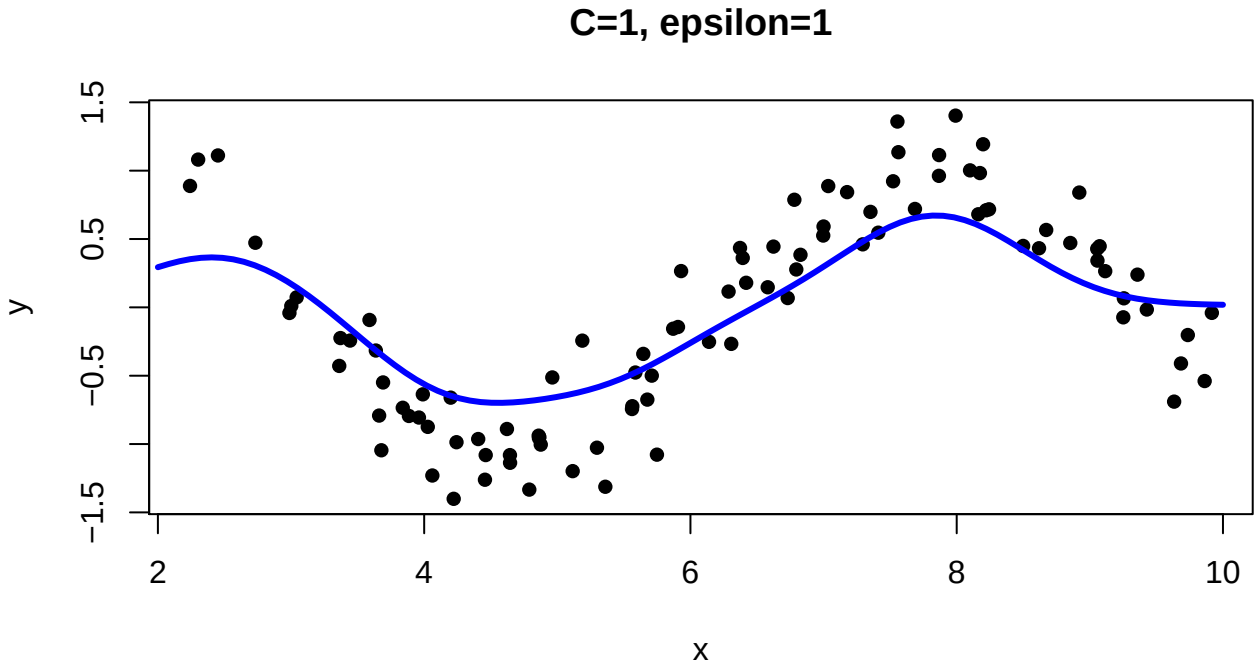

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```



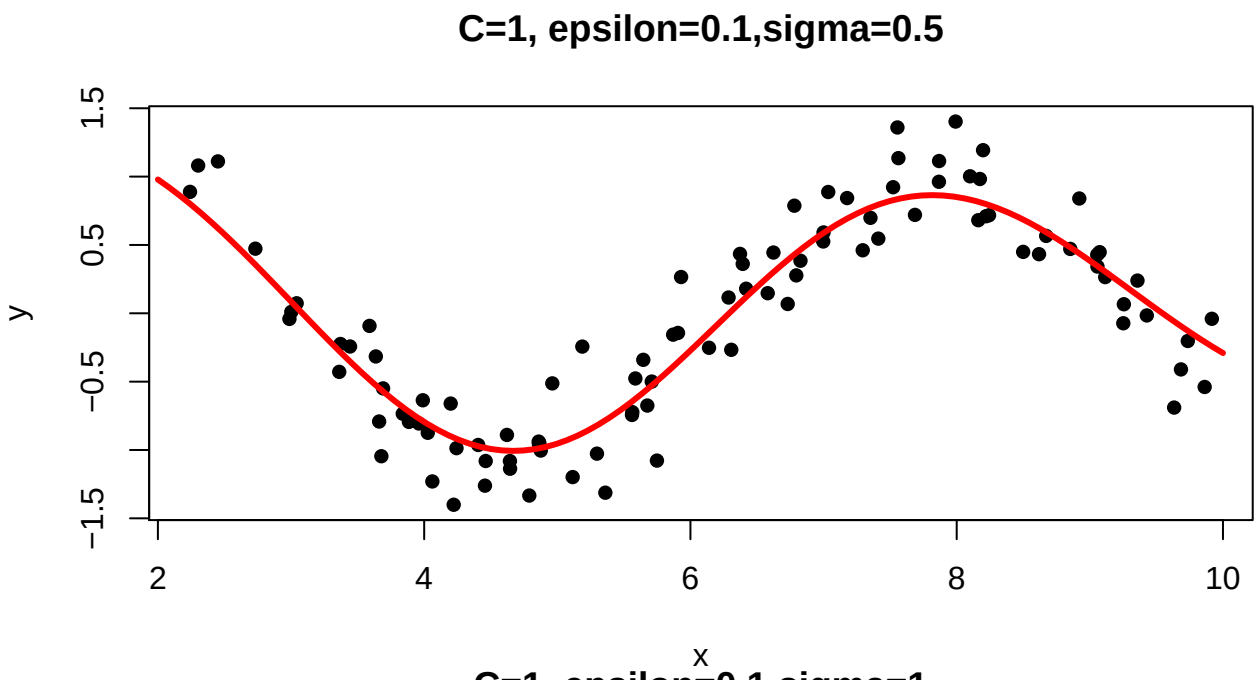

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```

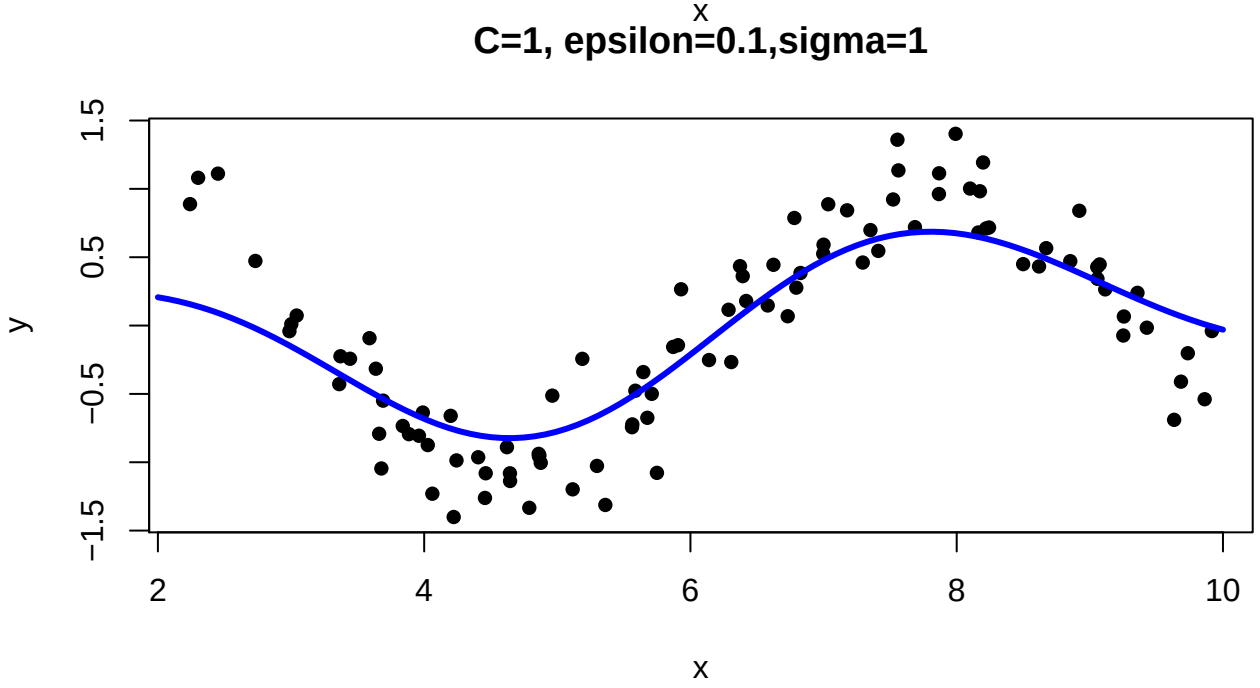


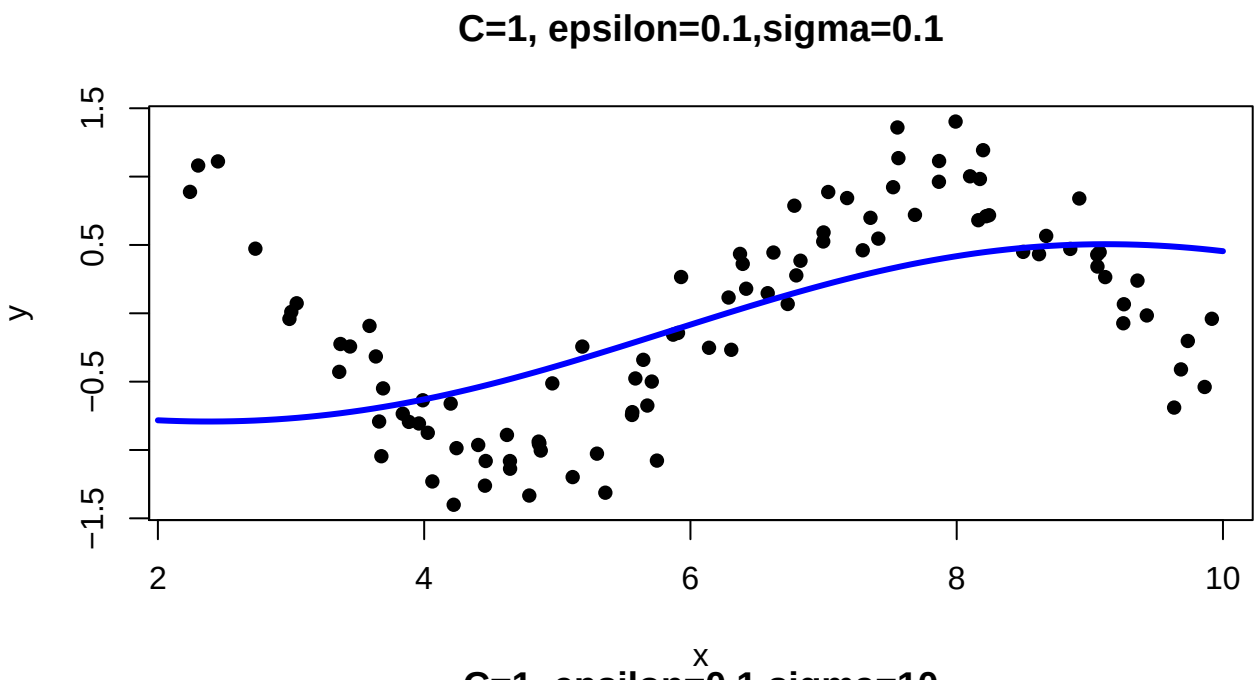

```
## Using automatic sigma estimation (sigest) for RBF or laplace kernel
```

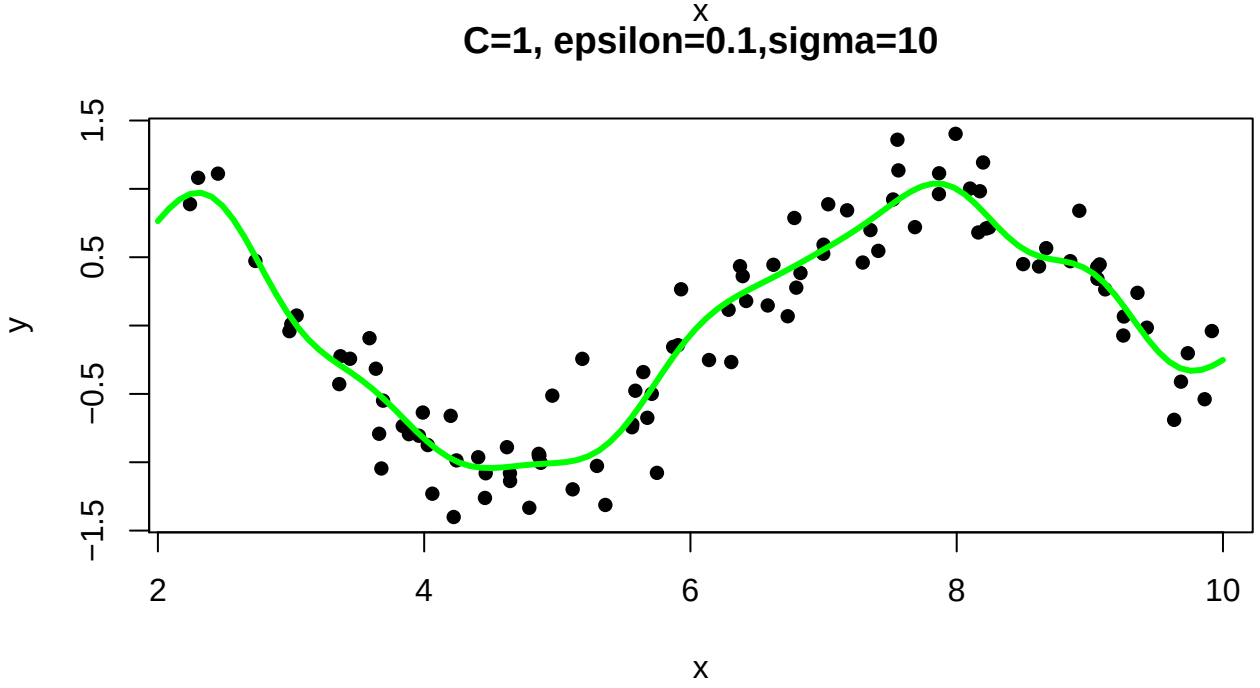


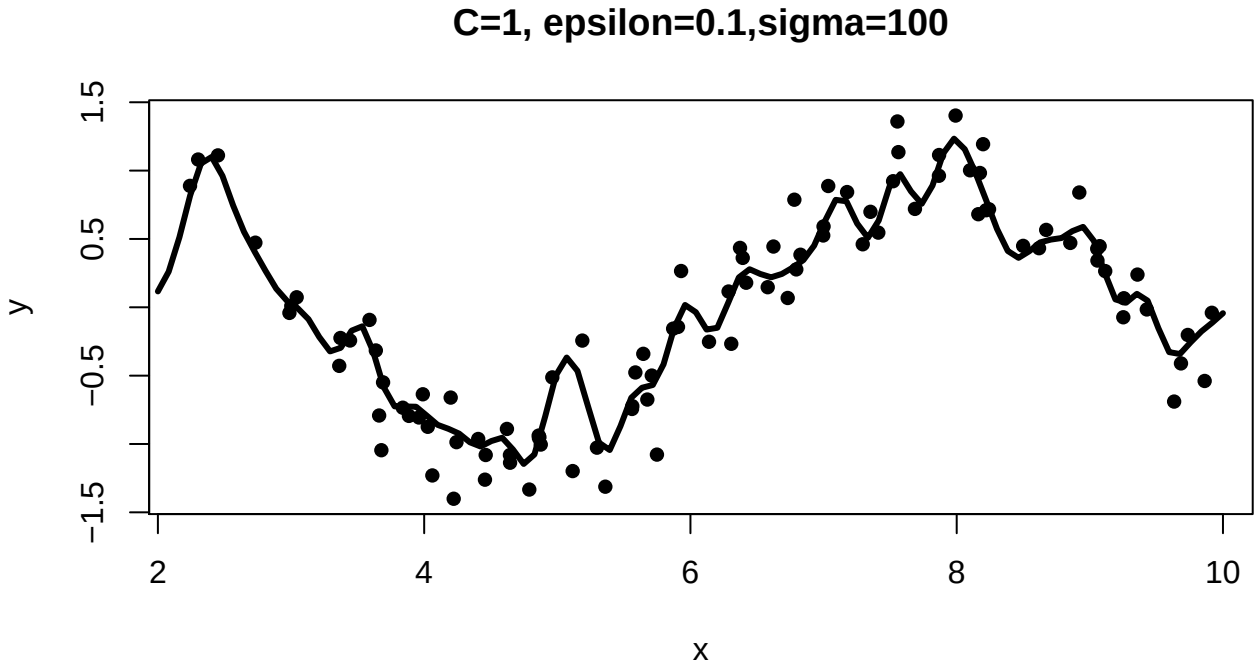

b).


C=1, epsilon=0.1,sigma=0.5
y
x
1.5
0.5
−0.5
−1.5
2
4
6
8
10


C=1, epsilon=0.1,sigma=1
y
x
1.5
0.5
−0.5
−1.5
2
4
6
8
10


C=1, epsilon=0.1,sigma=0.1
y
x
1.5
0.5
−0.5
−1.5
2
4
6
8
10


C=1, epsilon=0.1,sigma=10
y
x
1.5
0.5
−0.5
−1.5
2
4
6
8
10




epsilon determines how many data points will be used in the support vector to contribute to the regression line. the lower the epsilon many datapoints and higher the epsilon low data points to impact the prediction equatoin.

epsilon high means number of support vectors are low to compute the model. so underfits when epsiln too low too many data points it over fits.

sima parameter that controls the scale. string “automatic” which uses the heuristics in sigest to calculate a good sigma value for the Gaussian RBF

high sigma overfits low sigma underfits

The cost parameter is the main tool for adjusting the complexity of the model. When the cost is large, the model becomes very flexible since the effect of errors is amplified. When the cost is small, the model will “stiffen” and become less likely to over-fit (but more likely to underfit) because the contribution of the squared parameters is proportionally large in the modified error function.