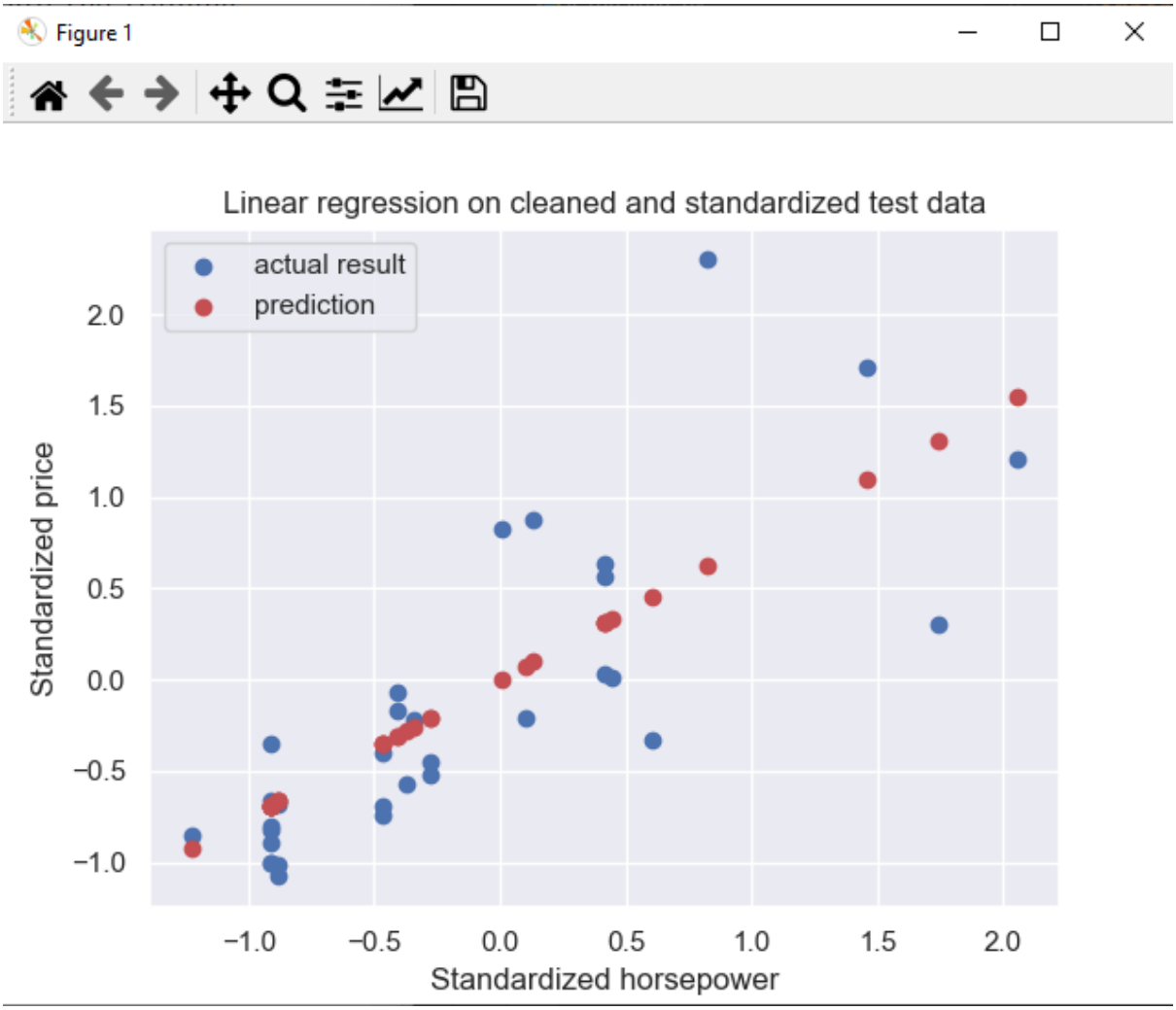
2.1.4



2.2

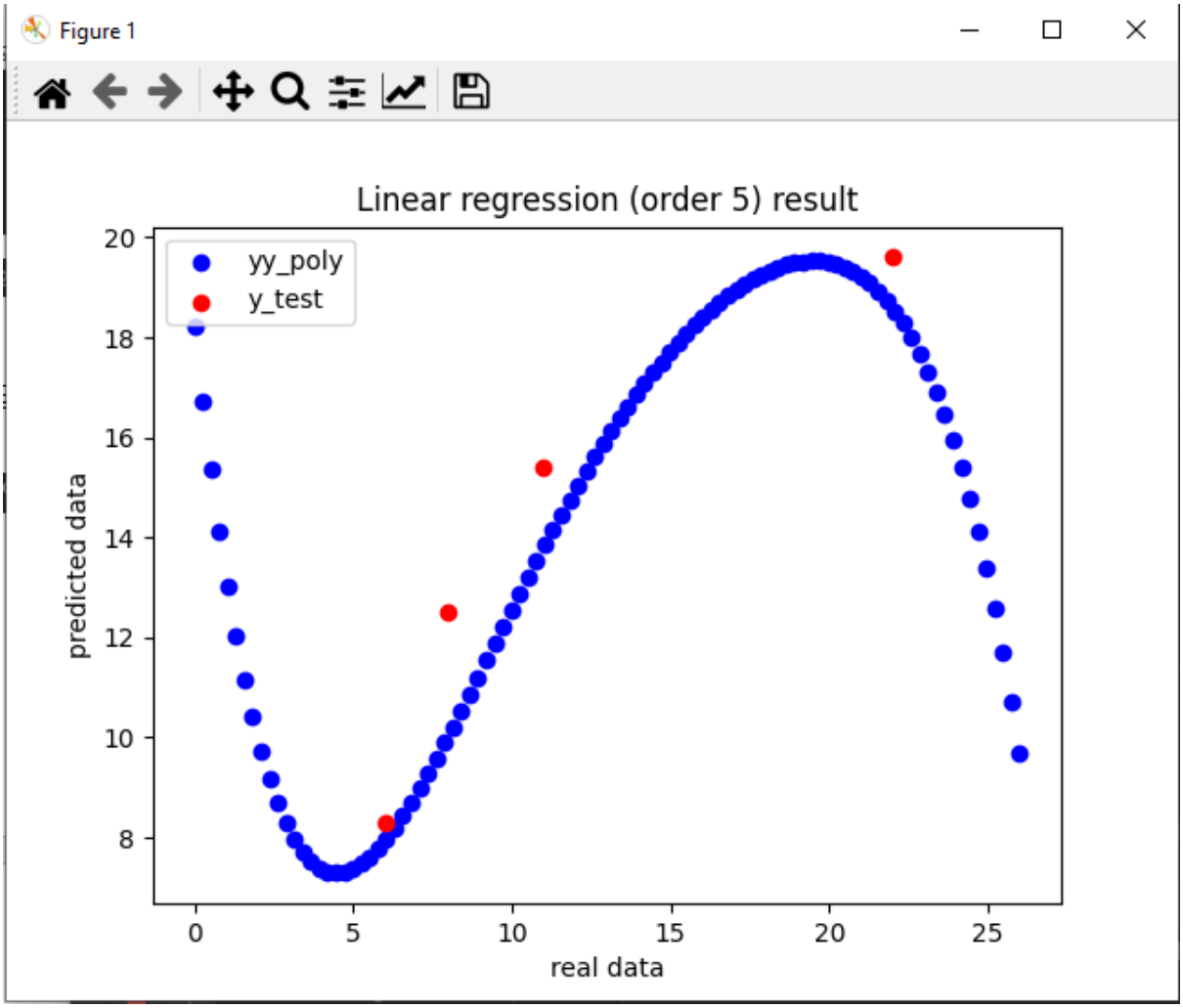
```
Parameter theta calculated by normal equation: [[ 9.02056208e-17]
 [-1.45788344e-01]
 [ 1.12758691e-01]
 [ 6.46914750e-01]
 [-3.81560961e-03]]
```

```
Parameter theta calculated by SGD [ 0.00151357 -0.18132595  0.25554462  0.45151899 -0.07941011]
```

2.3.1

y1= 18.23393 + (-6.05120) x + 1.11189 x*x + -0.07988 x*x*x + 0.00273 x*x*x*x + (-0.00004) x*x*x*x*x

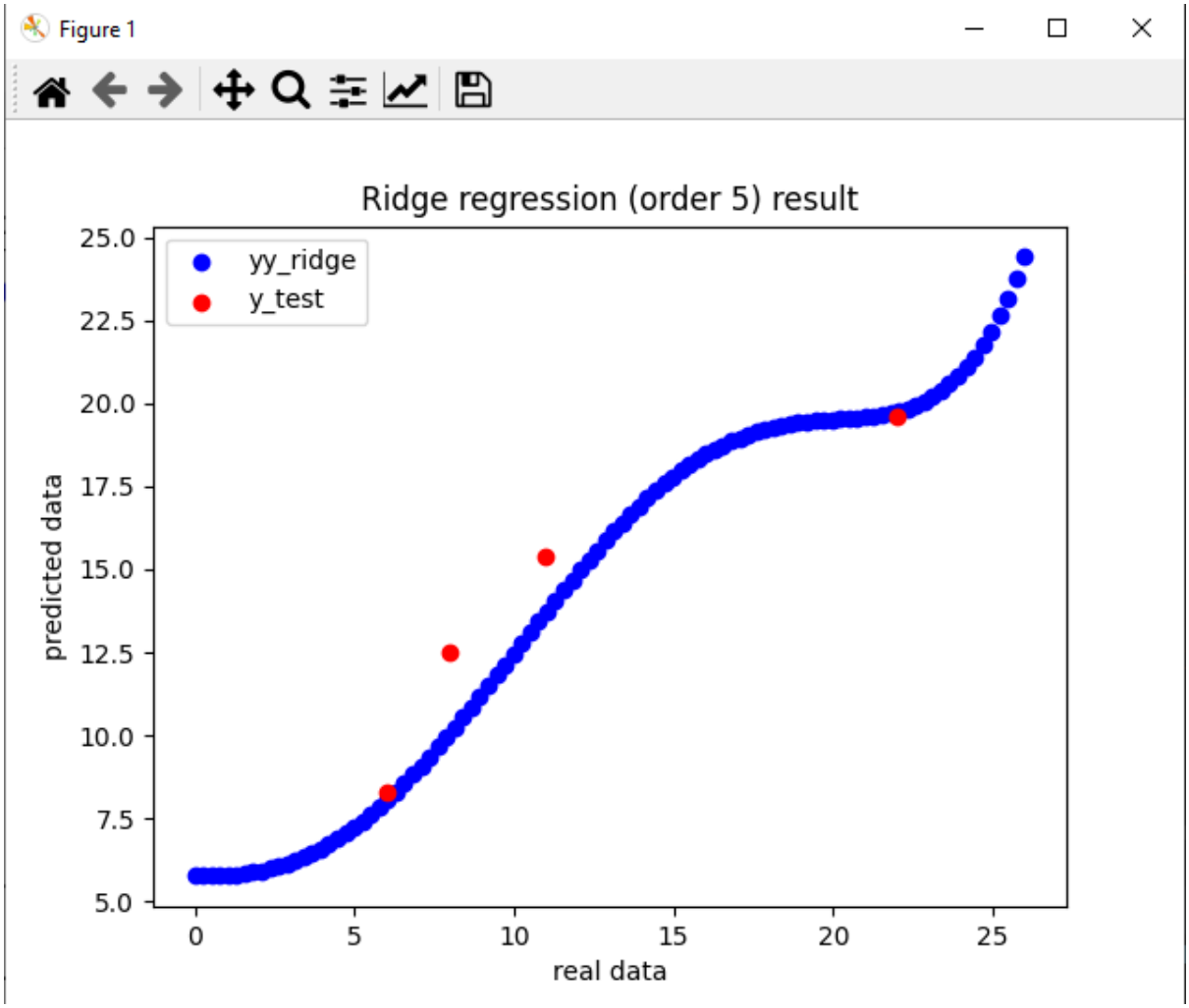
```
Linear regression (order 5) score is: 0.8567469916301036
```



2.3.2

y2= _5.76872_ + (-0.00294) x + 0.01235 x*x + 0.01433 x*x*x + _-0.00110_ x*x*x*x + _0.00002_ x*x*x*x*x

```
Ridge regression (order 5) score is: 0.8706689045757914
```



2.3.3

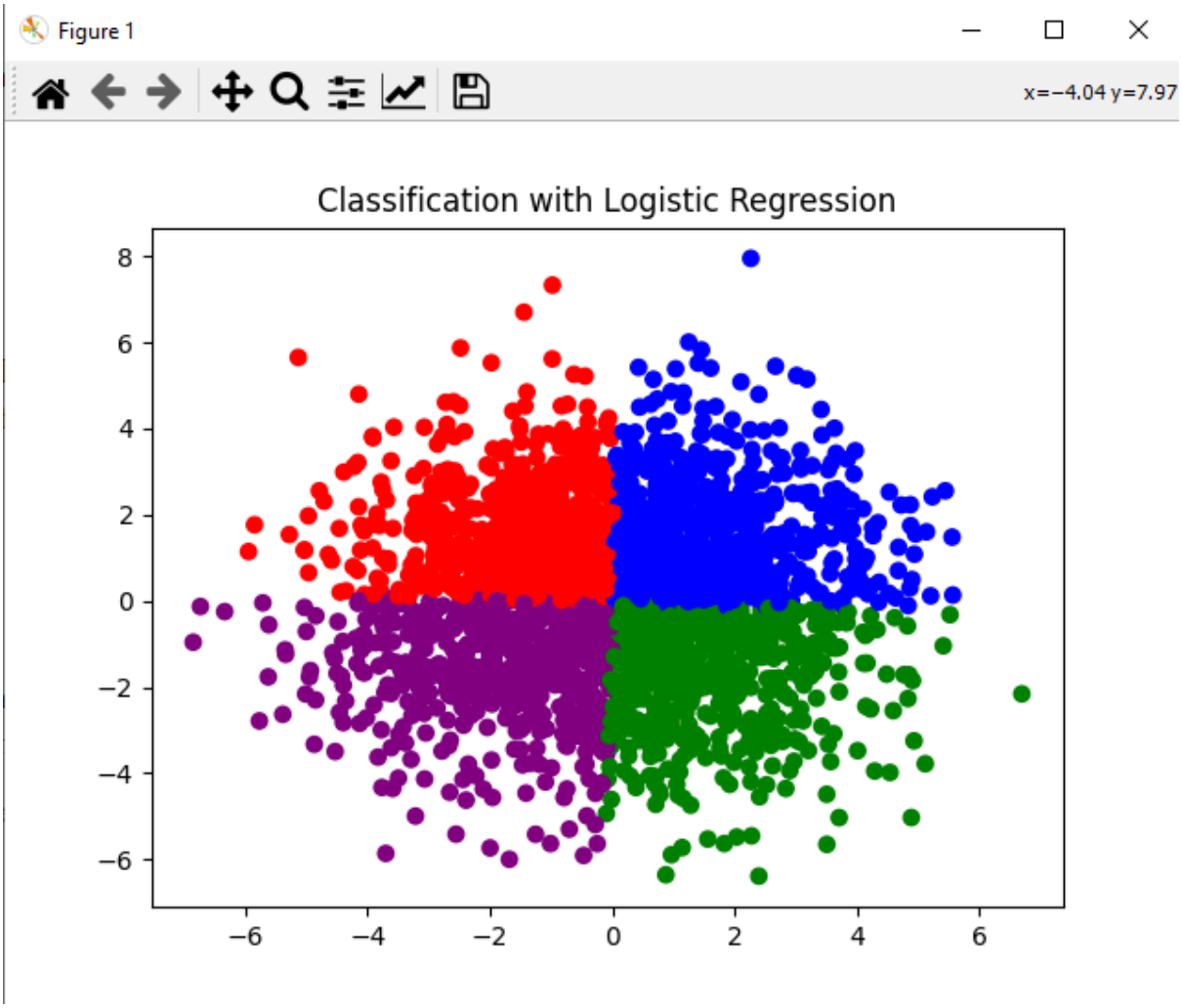
Q1: Ridge Regression model has the highest score

Q2: No, larger alpha doesn't make a larger coefficient for x^5

3.1

Q: Does the predictions of X_test contain values other than 0, 1, 2 or 3?

No



3.2

```
Number of wrong predictions is: 1244
```