2.

Cross-validation aims to split the data into 5 groups: 4 training and 1 testing sets. We will iterate through the dataset and use each index as the testing set while training the rest of the index values. The training will produce a more accurate training and testing error parameter. Cross-validation allows us to use multiple predictions for a more accurate data prediction compared to traditional prediction methods that uses singular training values. Although cross-validation may result in extra computational steps than the traditional train-test split.

|  |  |
| --- | --- |
| Iteration | Optimal parameter (d) |
| 1 | 3 |
| 2 | 2 |
| 3 | 3 |
| 4 | 3 |
| 5 | 4 |
| 6 | 4 |
| 7 | 5 |
| 8 | 3 |
| 9 | 4 |
| 10 | 4 |
| 11 | 3 |
| 12 | 4 |
| 13 | 3 |
| 14 | 4 |
| 15 | 4 |
| 16 | 4 |
| 17 | 3 |
| 18 | 4 |
| 19 | 4 |
| 20 | 5 |

Runs, Degree

0,2.0

1,3.0

2,4.0

3,3.0

4,3.0

5,3.0

6,4.0

7,4.0

8,2.0

9,4.0

10,5.0

11,3.0

12,5.0

13,3.0

14,3.0

15,4.0

16,4.0

17,3.0

18,3.0

19,4.0

|  |  |  |
| --- | --- | --- |
|  | Test Errors | Best Degrees |
| Mean | 0.102 | 3.75 |
| Standard deviation | 0.0207 | 1.34 |