KNN test for k=5:

Accuracy Score = 0.439

Confusion Matrix:

```
[[40  4  7  3 14  1  7  3 20  4]
 [ 5 46  2  0  8  0 16  0  9  3]
 [ 3  2 33  3 17 15 22  1  4  0]
 [ 1  3 14 28 19 10 24  3  1  0]
 [ 5  1  6  5 51  0 20  2  0  0]
 [ 0  1 14 10 18 15 21  4  0  3]
 [ 0  1  7  2 11  5 80  1  1  4]
 [ 2  1  7  4 26  4 15 34  3  6]
 [12 10  3  0  3  1  7  0 62  8]
 [ 7 14  3  0 19  1  5  2  8 50]]
```

R-Cross-Validation Result:

K : Accuracies for R=5

---

1 : [0.373, 0.404, 0.3885, 0.3855, 0.401]

3 : [0.4015, 0.413, 0.4, 0.413, 0.432]

5 : [0.4275, 0.427, 0.427, 0.4355, 0.443]

7 : [0.439, 0.418, 0.438, 0.4325, 0.452]

9 : [0.443, 0.431, 0.454, 0.4375, 0.4535]

11 : [0.443, 0.429, 0.442, 0.442, 0.4545]

13 : [0.451, 0.4275, 0.4415, 0.4385, 0.461]

15 : [0.449, 0.43, 0.446, 0.433, 0.4605]

17 : [0.448, 0.4315, 0.439, 0.435, 0.4555]

19 : [0.45, 0.426, 0.437, 0.4345, 0.448]

21 : [0.449, 0.4255, 0.4445, 0.436, 0.4505]

Optimal value of K = 13

Accuracy score = 0.463

Confusion Matrix:

```
[[35  3  6  0 22  1 12  2 21  1]
 [ 2 52  0  0  6  0 18  0  6  5]
 [ 2  1 28  4 21 12 27  2  3  0]
 [ 0  2  3 16 38  9 28  2  3  2]
 [ 2  1  4  4 55  0 21  1  0  2]
 [ 0  2  3  5 31 15 26  2  0  2]
 [ 0  1  1  1 11  4 93  0  0  1]
 [ 0  2  3  4 23  3 14 48  1  4]
 [ 9  6  3  0  7  2  6  0 70  3]
 [ 3 12  0  3 16  1 15  1  7 51]]
```

Testing Error = 0.53699

Training Error = 0.4557