|  |  |  |
| --- | --- | --- |
| Method: LinearSVC | DataSet:  Boston50 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 57.14285714285714 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 14.000000000000002 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 44.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 14.000000000000002 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 10.0 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 18.0 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 2.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 46.0 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 32.0 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 26.0 |
|  |  |  |
|  | Average Error = | 26.3142857143 |
|  | Standard Deviation of Error = | 17.0671901493 |

**Q 3 i**

|  |  |  |
| --- | --- | --- |
| Method: LinearSVC | DataSet:  Boston75 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 23.214285714285715 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 30.0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 26.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 10.0 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 42.0 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 16.0 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 60.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 42.0 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 64.0 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 10.0 |
|  |  |  |
|  | Average Error = | 32.3214285714 |
|  | Standard Deviation of Error = | 18.2979660406 |

|  |  |  |
| --- | --- | --- |
| Method: LinearSVC | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 9.13978494623656 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 10.05586592178771 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 3.910614525139665 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 11.731843575418994 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 11.1731843575419 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 8.938547486033519 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 3.35195530726257 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 2.793296089385475 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 7.262569832402235 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 13.966480446927374 |
|  |  |  |
|  | Average Error = | 8.23241424881 |
|  | Standard Deviation of Error = | 3.62549318327 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Boston50 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 66.07142857142857 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 66.0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 30.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 84.0 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 84.0 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 86.0 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 88.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 46.0 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 44.0 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 80.0 |
|  |  |  |
|  | Average Error = | 67.4071428571 |
|  | Standard Deviation of Error = | 19.7185308576 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Boston75 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 3.571428571428571 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 18.0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 26.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 4.0 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 60.0 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 46.0 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 66.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 20.0 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 16.0 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 4.0 |
|  |  |  |
|  | Average Error = | 26.3571428571 |
|  | Standard Deviation of Error = | 21.967624601 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 53.76344086021505 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 60.33519553072626 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 49.72067039106145 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 62.01117318435754 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 56.98324022346368 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 48.60335195530726 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 60.893854748603346 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 59.77653631284916 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 50.27932960893855 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 43.575418994413404 |
|  |  |  |
|  | Average Error = | 54.594221181 |
|  | Standard Deviation of Error = | 6.0048617547 |

|  |  |  |
| --- | --- | --- |
| Method:  Logistic Regression | DataSet:  Boston50 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 23.214285714285715 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 12.0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 16.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 12.0 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 12.0 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 18.0 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 6.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 28.000000000000004 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 28.000000000000004 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 4.0 |
|  |  |  |
|  | Average Error = | 15.9214285714 |
|  | Standard Deviation of Error = | 7.97486165193 |

|  |  |  |
| --- | --- | --- |
| Method:  Logistic Regression | DataSet:  Boston75 | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 3.571428571428571 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 8.0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 8.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 4.0 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 14.000000000000002 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 14.000000000000002 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 12.0 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 12.0 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 12.0 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 4.0 |
|  |  |  |
|  | Average Error = | 9.15714285714 |
|  | Standard Deviation of Error = | 3.97771855439 |

|  |  |  |
| --- | --- | --- |
| Method:  Logistic Regression | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 5.913978494623656 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 9.497206703910614 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 5.027932960893855 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 10.614525139664805 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 9.497206703910614 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 5.58659217877095 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 3.35195530726257 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 1.675977653631285 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 5.027932960893855 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 12.290502793296088 |
|  |  |  |
|  | Average Error = | 6.84838108969 |
|  | Standard Deviation of Error = | 3.25430663449 |

**Q3 ii**

**====**

|  |  |
| --- | --- |
| Method: Linear SVC  DataSet: Boston50 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 30.708661417322837 |
| 2 | 14.960629921259844 |
| 3 | 15.748031496062993 |
| 4 | 44.881889763779526 |
| 5 | 57.48031496062992 |
| 6 | 22.83464566929134 |
| 7 | 11.811023622047244 |
| 8 | 14.173228346456693 |
| 9 | 17.322834645669293 |
| 10 | 36.22047244094488 |
|  |  |
| Average Error = | 26.6141732283 |
| Standard Deviation of Error = | 14.573524789 |

|  |  |
| --- | --- |
| Method: Linear SVC  DataSet: Boston75 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 51.96850393700787 |
| 2 | 17.322834645669293 |
| 3 | 13.385826771653544 |
| 4 | 14.960629921259844 |
| 5 | 11.023622047244094 |
| 6 | 14.960629921259844 |
| 7 | 14.960629921259844 |
| 8 | 11.811023622047244 |
| 9 | 32.28346456692913 |
| 10 | 59.84251968503938 |
|  |  |
| Average Error = | 24.2519685039 |
| Standard Deviation of Error = | 16.8944893633 |

|  |  |
| --- | --- |
| Method: Linear SVC  DataSet: Digits | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 10.222222222222223 |
| 2 | 11.11111111111111 |
| 3 | 10.444444444444445 |
| 4 | 10.444444444444445 |
| 5 | 11.11111111111111 |
| 6 | 10.444444444444445 |
| 7 | 10.222222222222223 |
| 8 | 11.11111111111111 |
| 9 | 10.222222222222223 |
| 10 | 12.222222222222221 |
|  |  |
| Average Error = | 10.7555555556 |
| Standard Deviation of Error = | 0.606141408755 |

|  |  |
| --- | --- |
| Method: SVC  DataSet: Boston50 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 81.10236220472441 |
| 2 | 81.10236220472441 |
| 3 | 81.10236220472441 |
| 4 | 81.10236220472441 |
| 5 | 81.10236220472441 |
| 6 | 81.10236220472441 |
| 7 | 81.10236220472441 |
| 8 | 81.10236220472441 |
| 9 | 81.10236220472441 |
| 10 | 81.10236220472441 |
|  |  |
| Average Error = | 81.1023622047 |
| Standard Deviation of Error = | 0.0 |

|  |  |
| --- | --- |
| Method: SVC  DataSet: Boston75 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 3.149606299212598 |
| 2 | 3.149606299212598 |
| 3 | 3.149606299212598 |
| 4 | 3.149606299212598 |
| 5 | 3.149606299212598 |
| 6 | 3.149606299212598 |
| 7 | 3.149606299212598 |
| 8 | 3.149606299212598 |
| 9 | 3.149606299212598 |
| 10 | 3.149606299212598 |
|  |  |
| Average Error = | 3.149606299212598 |
| Standard Deviation of Error = | 4408920985e-16 |

|  |  |
| --- | --- |
| Method: SVC  DataSet: Digits | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 49.333333333333336 |
| 2 | 49.333333333333336 |
| 3 | 49.333333333333336 |
| 4 | 49.333333333333336 |
| 5 | 49.333333333333336 |
| 6 | 49.333333333333336 |
| 7 | 49.333333333333336 |
| 8 | 49.333333333333336 |
| 9 | 49.333333333333336 |
| 10 | 49.333333333333336 |
|  |  |
| Average Error = | 49.333333333333336 |
| Standard Deviation of Error = | 7.1054273576e-15 |

|  |  |
| --- | --- |
| Method: Logistic Regression  DataSet: Boston50 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 21.25984251968504 |
| 2 | 21.25984251968504 |
| 3 | 21.25984251968504 |
| 4 | 21.25984251968504 |
| 5 | 21.25984251968504 |
| 6 | 21.25984251968504 |
| 7 | 21.25984251968504 |
| 8 | 21.25984251968504 |
| 9 | 21.25984251968504 |
| 10 | 21.25984251968504 |
|  |  |
| Average Error = | 21.25984251968504 |
| Standard Deviation of Error = | 0.0 |

|  |  |
| --- | --- |
| Method: Logistic Regression  DataSet: Boston75 | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 3.937007874015748 |
| 2 | 3.937007874015748 |
| 3 | 3.937007874015748 |
| 4 | 3.937007874015748 |
| 5 | 3.937007874015748 |
| 6 | 3.937007874015748 |
| 7 | 3.937007874015748 |
| 8 | 3.937007874015748 |
| 9 | 3.937007874015748 |
| 10 | 3.937007874015748 |
|  |  |
| Average Error = | 3.937007874015748 |
| Standard Deviation of Error = | 0.0 |

|  |  |
| --- | --- |
| Method: Logistic Regression  DataSet: Digits | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 | 9.777777777777779 |
| 2 | 9.777777777777779 |
| 3 | 9.777777777777779 |
| 4 | 9.777777777777779 |
| 5 | 9.777777777777779 |
| 6 | 9.777777777777779 |
| 7 | 9.777777777777779 |
| 8 | 9.777777777777779 |
| 9 | 9.777777777777779 |
| 10 | 9.777777777777779 |
|  |  |
| Average Error = | 9.777777777777779 |
| Standard Deviation of Error = | 1.7763568394e-15 |

|  |  |
| --- | --- |
| Method: Logistic Regression  DataSet: B | Pi = 0.75  K = 10 |
| **Test** | **Error** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
|  |  |
| Average Error = |  |
| Standard Deviation of Error = |  |

**Q4**

**===**

**Q .4.1**

|  |  |  |
| --- | --- | --- |
| Method:  LinearSVC | DataSet:  Digits | K = 10  Rand\_proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 13.978494623655912 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 13.966480446927374 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 8.379888268156424 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 17.318435754189945 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 16.201117318435752 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 12.290502793296088 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 10.05586592178771 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 3.910614525139665 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 10.05586592178771 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 16.75977653631285 |
|  |  |  |
|  | Average Error = | 12.291704211 |
|  | Standard Deviation of Error = | 4.02129660608 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Digits | K = 10  Rand\_proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 90.32258064516128 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 90.5027932960894 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 91.62011173184358 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 90.5027932960894 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 90.5027932960894 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 89.94413407821229 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 91.06145251396647 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 91.06145251396647 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 90.5027932960894 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 90.5027932960894 |
|  |  |  |
|  | Average Error = | 90.6523697964 |
|  | Standard Deviation of Error = | 0.446480252336 |

|  |  |  |
| --- | --- | --- |
| Method:  Logistic Regression | DataSet:  Digits | K = 10  Rand\_Proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 11.29032258064516 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 14.52513966480447 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 3.35195530726257 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 13.40782122905028 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 12.290502793296088 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 11.1731843575419 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 6.145251396648044 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 6.145251396648044 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 5.027932960893855 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 11.1731843575419 |
|  |  |  |
|  | Average Error = | 9.45305460443 |
|  | Standard Deviation of Error = | 3.7067347195 |

**Q . 4.2**

**=====**

|  |  |  |
| --- | --- | --- |
| Method:  LinearSVC | DataSet:  Digits | K = 10  Quad\_Proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 4.838709677419355 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 5.027932960893855 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 0.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 6.70391061452514 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 3.35195530726257 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 2.2346368715083798 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 2.2346368715083798 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 0.5586592178770949 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 1.1173184357541899 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 3.35195530726257 |
|  |  |  |
|  | Average Error = | 2.9419715264 |
|  | Standard Deviation of Error = | 2.02737730516 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Digits | K = 10  Quad\_Proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 90.32258064516128 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 90.5027932960894 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 91.62011173184358 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 90.5027932960894 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 90.5027932960894 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 89.94413407821229 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 91.06145251396647 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 91.06145251396647 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 90.5027932960894 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 83.79888268156425 |
|  |  |  |
|  | Average Error = | 89.9819787349 |
|  | Standard Deviation of Error = | 2.10824848886 |

|  |  |  |
| --- | --- | --- |
| Method:  Logistic Regression | DataSet:  Digits | K = 10  Quad\_Proj |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 4.838709677419355 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 5.027932960893855 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 0.0 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 5.58659217877095 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 3.35195530726257 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 2.793296089385475 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 1.675977653631285 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 0.5586592178770949 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 1.1173184357541899 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 3.35195530726257 |
|  |  |  |
|  | Average Error = | 2.83023968283 |
|  | Standard Deviation of Error = | 1.85590356058 |

**Q 4.3**

**=====**

|  |  |  |
| --- | --- | --- |
| Method:  LinearSVC | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 14.516129032258066 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 12.849162011173185 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 5.027932960893855 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 15.083798882681565 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 9.497206703910614 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 11.1731843575419 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 8.379888268156424 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 8.379888268156424 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 7.262569832402235 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 13.966480446927374 |
|  |  |  |
|  | Average Error = | 10.6136240764 |
|  | Standard Deviation of Error = | 3.2468359982 |

|  |  |  |
| --- | --- | --- |
| Method:  SVC | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 90.32258064516128 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 90.5027932960894 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 91.62011173184358 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 90.5027932960894 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 90.5027932960894 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 89.94413407821229 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 91.06145251396647 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 91.06145251396647 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 90.5027932960894 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 91.06145251396647 |
|  |  |  |
|  | Average Error = | 90.7082357181 |
|  | Standard Deviation of Error = | 0.459043754505 |
| Method:  Logistic Regression | DataSet:  Digits | K = 10 |
| **Train** | **Test** | **Error** |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 14.516129032258066 |
| 2, 3, 4, 5, 6, 7, 8, 9, 10 | 1 | 13.966480446927374 |
| 3, 4, 5, 6, 7, 8, 9, 10, 1 | 2 | 6.145251396648044 |
| 4, 5, 6, 7, 8, 9, 10, 1, 2 | 3 | 18.435754189944134 |
| 5, 6, 7, 8, 9, 10, 1, 2, 3 | 4 | 11.731843575418994 |
| 6, 7, 8, 9, 10, 1, 2, 3, 4 | 5 | 9.497206703910614 |
| 7, 8, 9, 10, 1, 2, 3, 4, 5 | 6 | 13.40782122905028 |
| 8, 9, 10, 1, 2, 3, 4, 5, 6 | 7 | 6.70391061452514 |
| 9, 10, 1, 2, 3, 4, 5, 6, 7 | 8 | 5.58659217877095 |
| 10, 1, 2, 3, 4, 5, 6, 7, 8 | 9 | 12.290502793296088 |
|  |  |  |
|  | Average Error = | 11.2281492161 |
|  | Standard Deviation of Error = | 3.96887924769 |