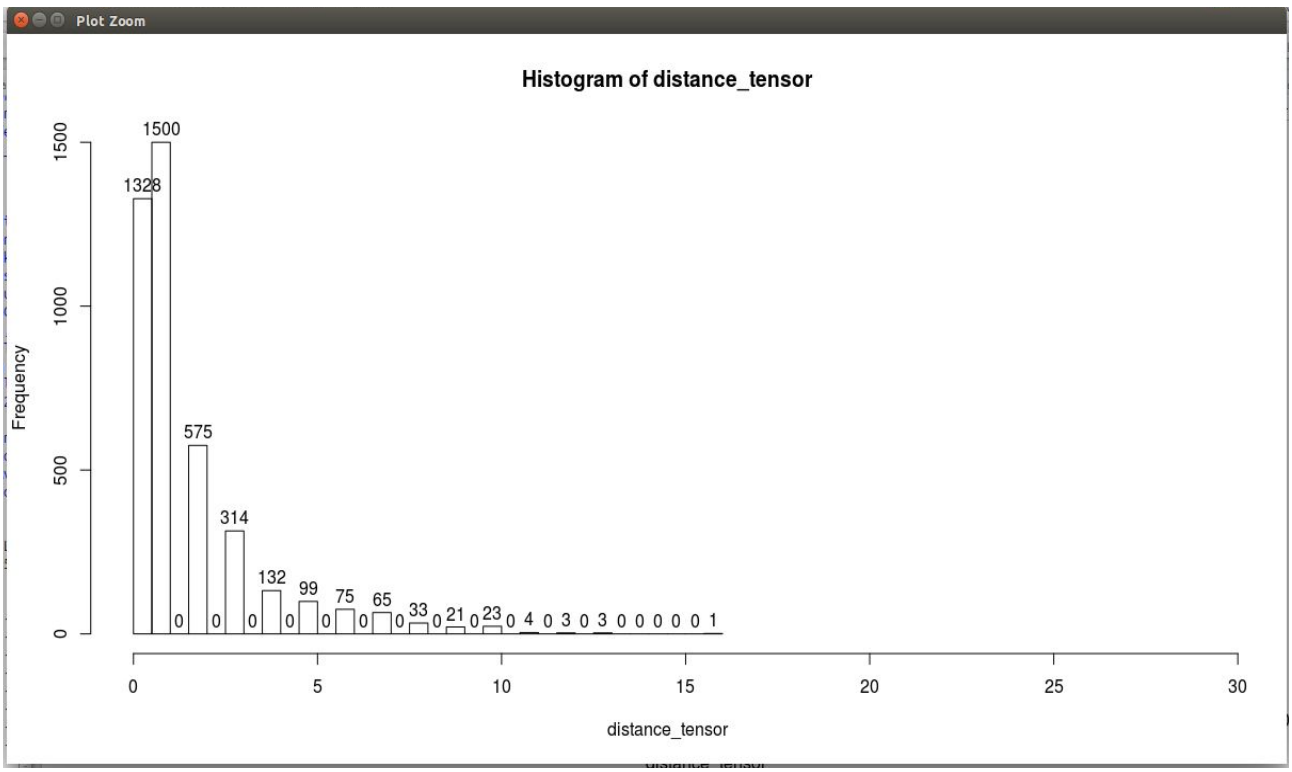
Programming Assignment 4
Dipti Chaudhari

- **EXERCISE 1**

```
     [,1]         [,2]       [,3]
 [1,] "Degree" "Cost" "Accuracy"
 [2,] "1"      "100"  "26.0536398467433"
 [3,] "1"      "10"   "25.742337164751"
 [4,] "1"      "1"    "25.2634099616858"
 [5,] "1"      "0.1"  "24.2097701149425"
 [6,] "2"      "100"  "26.7001915708812"
 [7,] "2"      "10"   "26.5086206896552"
 [8,] "2"      "1"    "26.3409961685824"
 [9,] "2"      "0.1"  "24.161877394636"
[10,] "3"      "100"  "25.4789272030651"
[11,] "3"      "10"   "25.8860153256705"
[12,] "3"      "1"    "24.2816091954023"
[13,] "3"      "0.1"  "23.8745210727969"
```



Predicted rings away from the true number of rings

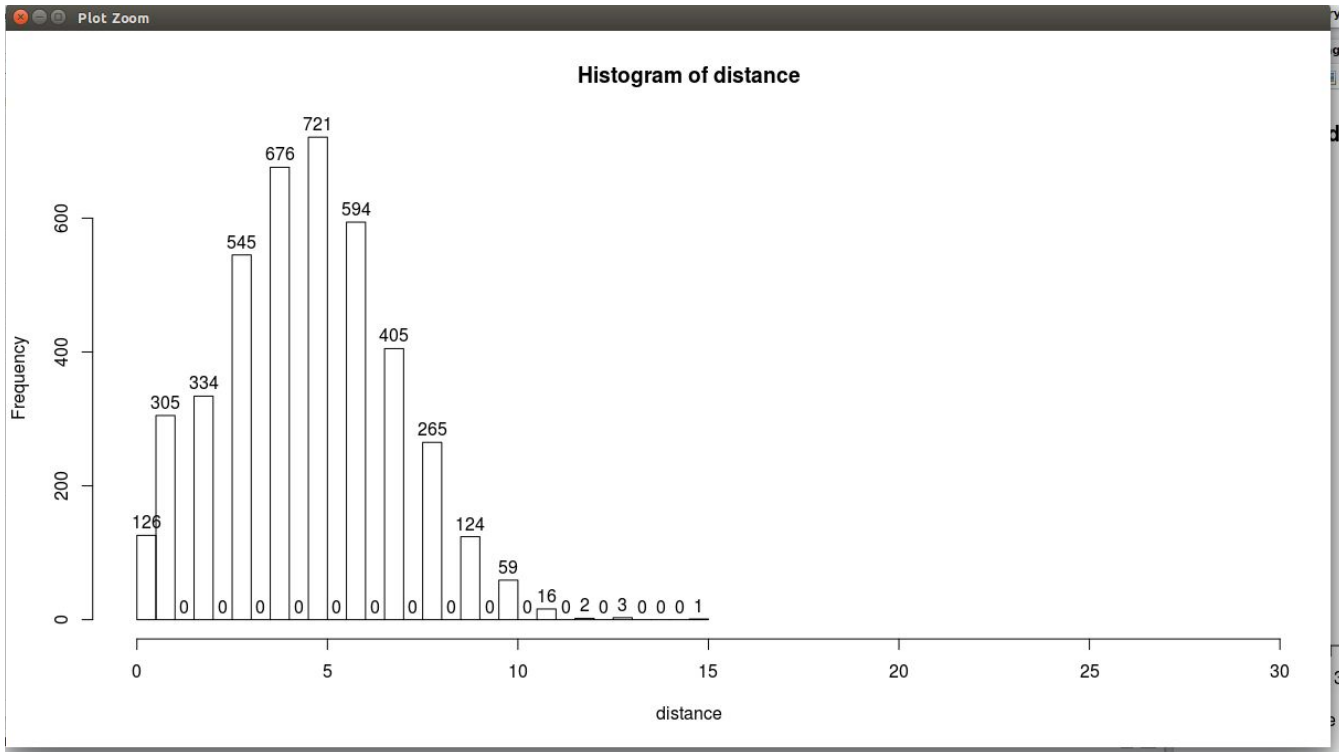
Average Loss = 1.691331

- **EXERCISE 2**

```
      [,1]               [,2]     [,3]       [,4]       [,5]                    [,6]
 [1,] "Description"      "Size"   "Degree"   "Cost"     "CV Accuracy"           "Training Accuracy"
 [2,] "LE9_GE10"         "4176"   "2"        "100"      "79.6695402298851"      "31.8007662835249"
 [3,] "LE7_E8E9"         "2096"   "2"        "100"      "83.206106870229"       "31.7748091603053"
 [4,] "LE9 vs GE10"      "839"    "2"        "100"      "87.3659117997616"      "22.1692491060787"
 [5,] "E8_E9"            "1257"   "2"        "100"      "63.1662688941925"      "27.2871917263325"
 [6,] "E8_E9"            "650"    "2"        "100"      "64.3076923076923"      "21.6923076923077"
 [7,] "E10E11_GE12"      "2080"   "2"        "100"      "70.0480769230769"      "31.7788461538462"
 [8,] "E12E13_GE14"      "959"    "2"        "100"      "64.1293013555787"      "23.7747653806048"
 [9,] "E10_E11"          "1121"   "2"        "100"      "58.9652096342551"      "25.6021409455843"
[10,] "E12_E13"          "470"    "2"        "100"      "59.1489361702128"      "22.7659574468085"
```

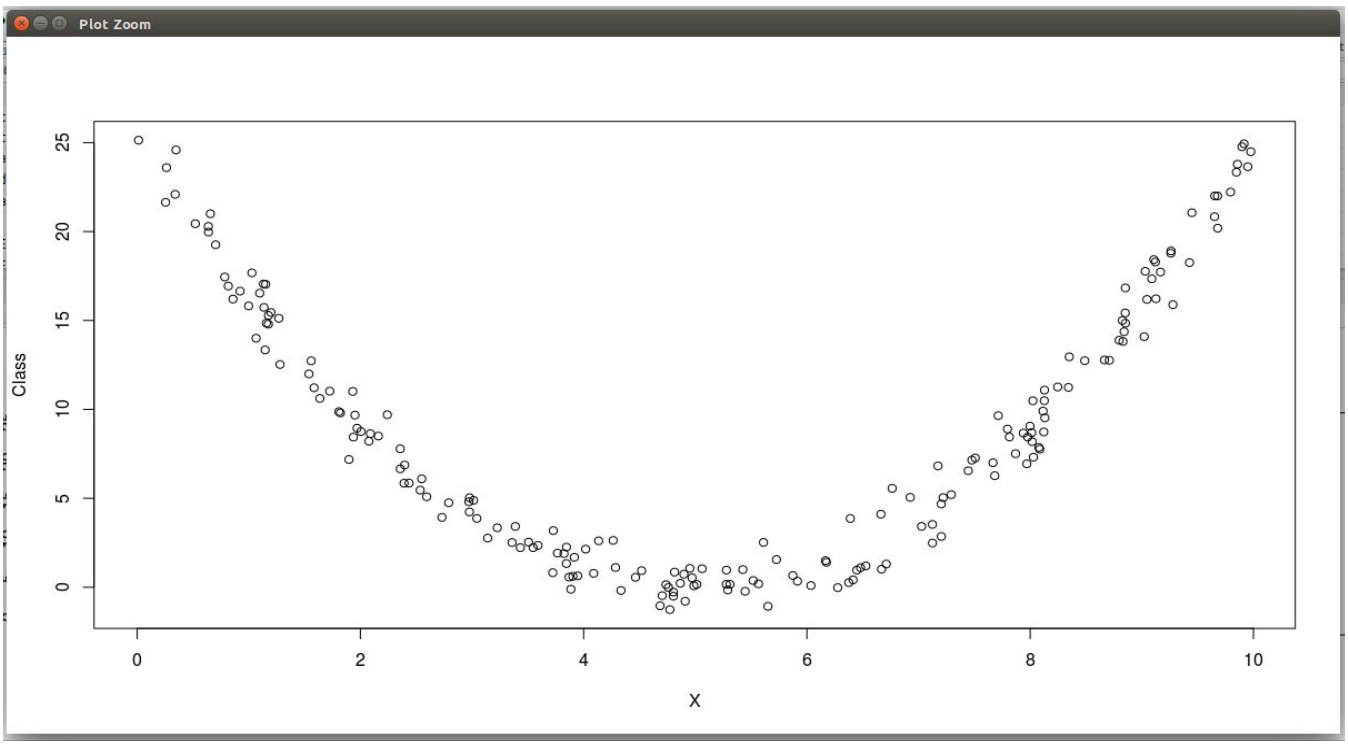
- **EXERCISE 3**

Training_Accuracy= 3.017241
Average Distance = 4.644636



Predicted rings away from the true number of rings

- **EXERCISE 4**



Visualization of input data

```
     [,1]     [,2]   [,3]
[1,] "Degree" "Cost" "Accuracy"
[2,] "0.1"    "0.1"  "1.80168484389229"
[3,] "1.75"   "100"  "64.1302967013836"
[4,] "1.75"   "10"   "64.1462951945531"
[5,] "1.75"   "1"    "64.1366052255392"
[6,] "1.75"   "0.1"  "64.2619251272652"
[7,] "1.5"    "100"  "45.796678659352"
```

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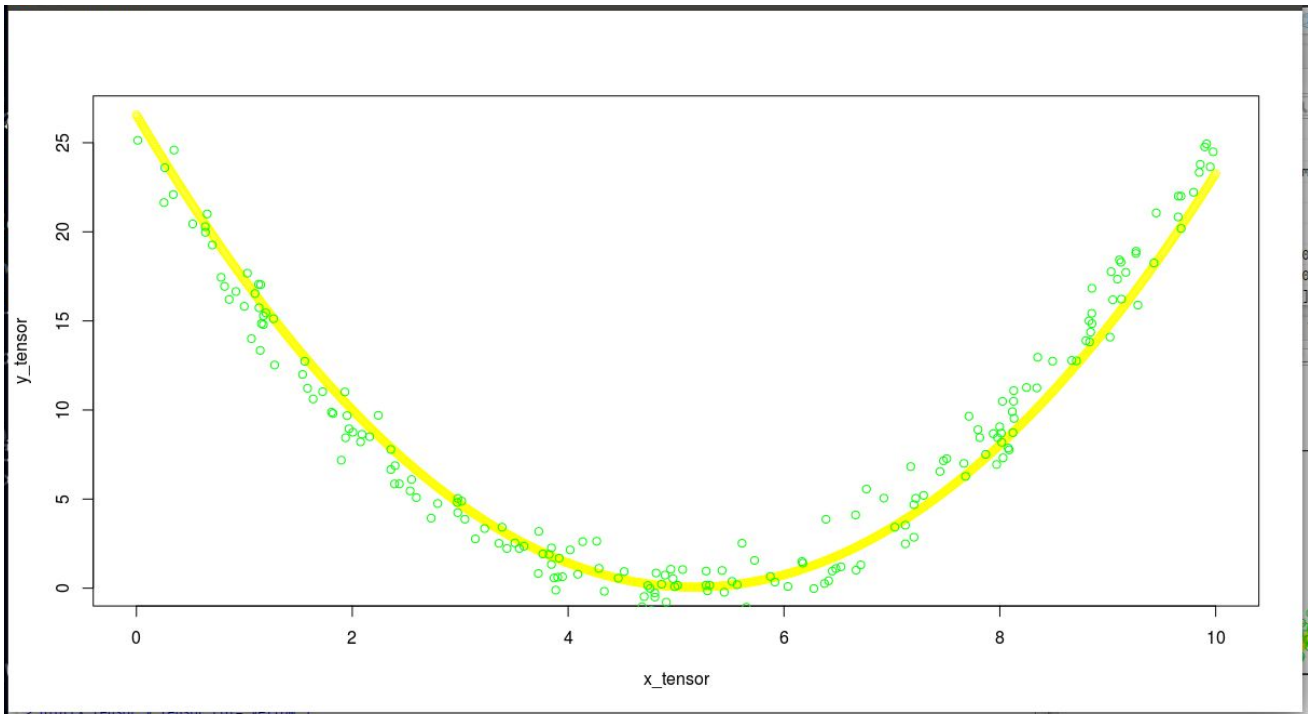
 [8,] "1.5"    "10"   "45.8001055218013"
 [9,] "1.5"    "1"    "45.7979126042652"
[10,] "1.5"    "0.1"  "45.7196961115478"
[11,] "1"      "100"  "18.2504907611525"
[12,] "1"      "10"   "18.2652057690032"
[13,] "1"      "1"    "18.2410276357969"
[14,] "1"      "0.1"  "20.4108217165762"
[15,] "0.1"    "100"  "1.78793749415465"
[16,] "0.1"    "10"   "1.77527093154988"
[17,] "0.1"    "1"    "1.77909695059551"
[18,] "0.1"    "0.1"  "1.79391602640831"
```

- **EXERCISE 5**



Green circular plot- Input data, yellow representation - prediction for input value.

```
     [,1]     [,2]   [,3]      [,4]
 [1,] "Degree" "Cost" "Epsilon" "tot.MSE"
 [2,] "1"      "100"  "0.1"     "5.03362898107193"
 [3,] "1"      "100"  "1"       "5.49976332900309"
 [4,] "1"      "100"  "1.5"     "7.90447119047879"
 [5,] "1"      "100"  "1.75"    "9.58878559219324"
 [6,] "1"      "10"   "0.1"     "5.05556801064113"
 [7,] "1"      "10"   "1"       "5.50308019447286"
 [8,] "1"      "10"   "1.5"     "7.89922313062538"
 [9,] "1"      "10"   "1.75"    "9.88849385554586"
[10,] "1"      "1"    "0.1"     "5.10017509228403"
[11,] "1"      "1"    "1"       "5.62005571185364"
[12,] "1"      "1"    "1.5"     "8.34457985011706"
[13,] "1"      "1"    "1.75"    "10.9631535399221"
[14,] "1"      "0.1"  "0.1"     "5.40414139235917"
[15,] "1"      "0.1"  "1"       "6.12713473223472"
[16,] "1"      "0.1"  "1.5"     "9.56676411025097"
[17,] "1"      "0.1"  "1.75"    "12.2431494329611"
[18,] "2"      "100"  "0.1"     "5.61126008498607"
[19,] "2"      "100"  "1"       "5.29716938370346"
[20,] "2"      "100"  "1.5"     "8.06348773287082"
[21,] "2"      "100"  "1.75"    "11.5786965216877"
```

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[22,] "2"      "10"   "0.1"     "5.61102978594221"
[23,] "2"      "10"   "1"       "5.5977528070241"
[24,] "2"      "10"   "1.5"     "11.2204892997954"
[25,] "2"      "10"   "1.75"    "11.5239818437648"
[26,] "2"      "1"    "0.1"     "6.31464691580513"
[27,] "2"      "1"    "1"       "7.51456170497433"
[28,] "2"      "1"    "1.5"     "10.3445697420905"
[29,] "2"      "1"    "1.75"    "12.2446977075953"
[30,] "2"      "0.1"  "0.1"     "6.3259810458576"
[31,] "2"      "0.1"  "1"       "6.86309907469499"
[32,] "2"      "0.1"  "1.5"     "9.98070069099437"
[33,] "2"      "0.1"  "1.75"    "12.3232643532121"
[34,] "3"      "100"  "0.1"     "386.521981441847"
[35,] "3"      "100"  "1"       "701.087909623635"
[36,] "3"      "100"  "1.5"     "578.443053249371"
[37,] "3"      "100"  "1.75"    "412.634973471507"
[38,] "3"      "10"   "0.1"     "20.8319431053032"
[39,] "3"      "10"   "1"       "284.157454090155"
[40,] "3"      "10"   "1.5"     "11.9708881423279"
[41,] "3"      "10"   "1.75"    "199.072276746291"
[42,] "3"      "1"    "0.1"     "35.39172392176"
[43,] "3"      "1"    "1"       "7.65074519131194"
[44,] "3"      "1"    "1.5"     "10.3605478632712"
[45,] "3"      "1"    "1.75"    "11.3701487727424"
[46,] "3"      "0.1"  "0.1"     "7.67475221857816"
[47,] "3"      "0.1"  "1"       "12.5992484666253"
[48,] "3"      "0.1"  "1.75"    "11.7251726039039"
[49,] "3"      "0.1"  "1.75"    "13.1443345322837"
```

- **EXERCISE 6**

Average Distance = 1.471743