MultiClass Classification

Question (i) – Naïve Bayes and SVM

The classifiers were trained for the following classes:

1. comp.sys.ibm.pc.hardware
2. comp.sys.mac.hardware
3. misc.forsale
4. soc.religion.christian.

OneVsOne and OneVsRest classification techniques to train our classifiers.

**Results for OneVsOne Classification:**

1. Naïve Bayes Classifier

|  |  |
| --- | --- |
|  | **Result** |
| Recall | 73.5025918685 |
| Accuracy | 73.6741214058 |
| Precision | 77.0457299961 |

Confusion Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 278 | 18 | 94 | 2 |
| 70 | 186 | 125 | 4 |
| 47 | 19 | 323 | 1 |
| 0 | 0 | 32 | 366 |

1. SVM

|  |  |
| --- | --- |
|  | **Result** |
| Recall | 88.2601047851 |
| Accuracy | 88.3067092652 |
| Precision | 88.4576980617 |

Confusion Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 333 | 44 | 15 | 0 |
| 40 | 323 | 22 | 0 |
| 29 | 14 | 346 | 1 |
| 9 | 4 | 5 | 380 |

**Results for OneVsRestClassifier**

1. Naïve Bayes Classifier

|  |  |
| --- | --- |
|  | **Result** |
| Recall | 72.4044929407 |
| Accuracy | 72.5878594249 |
| Precision | 76.7645816972 |

Confusion Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 257 | 16 | 118 | 1 |
| 63 | 177 | 140 | 5 |
| 40 | 17 | 330 | 3 |
| 0 | 0 | 26 | 372 |

1. SVM

|  |  |
| --- | --- |
|  | **Result** |
| Recall | 88.8913870886 |
| Accuracy | 88.945686901 |
| Precision | 88.8656279393 |

Confusion Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 322 | 47 | 20 | 3 |
| 32 | 324 | 27 | 2 |
| 20 | 13 | 355 | 2 |
| 3 | 1 | 3 | 391 |