Classification Matrix for LR

| Class | Insufficient\_Weight | Normal\_Weight | Obesity\_Type\_I | Obesity\_Type\_II | Obesity\_Type\_III | Overweight\_Level\_I | Overweight\_Level\_II |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 61 | 9 | 0 | 0 | 0 | 0 | 0 |
| Normal\_Weight | 7 | 57 | 0 | 0 | 0 | 2 | 0 |
| Obesity\_Type\_I | 0 | 0 | 80 | 2 | 1 | 1 | 2 |
| Obesity\_Type\_II | 0 | 0 | 2 | 71 | 1 | 0 | 0 |
| Obesity\_Type\_III | 0 | 0 | 0 | 0 | 79 | 1 | 0 |
| Overweight\_Level\_I | 0 | 5 | 0 | 0 | 0 | 67 | 2 |
| Overweight\_Level\_II | 0 | 0 | 5 | 1 | 0 | 1 | 68 |

Classification Matrix for SVM

| Class | Insufficient\_Weight | Normal\_Weight | Obesity\_Type\_I | Obesity\_Type\_II | Obesity\_Type\_III | Overweight\_Level\_I | Overweight\_Level\_II |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 67 | 6 | 0 | 0 | 0 | 0 | 0 |
| Normal\_Weight | 1 | 65 | 0 | 0 | 0 | 38 | 1 |
| Obesity\_Type\_I | 0 | 0 | 67 | 2 | 0 | 0 | 6 |
| Obesity\_Type\_II | 0 | 0 | 5 | 72 | 0 | 0 | 1 |
| Obesity\_Type\_III | 0 | 0 | 0 | 0 | 81 | 0 | 0 |
| Overweight\_Level\_I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Overweight\_Level\_II | 0 | 0 | 15 | 0 | 0 | 34 | 64 |

Classification Matrix for KNN

| Class | Insufficient\_Weight | Normal\_Weight | Obesity\_Type\_I | Obesity\_Type\_II | Obesity\_Type\_III | Overweight\_Level\_I | Overweight\_Level\_II |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 60 | 13 | 0 | 0 | 0 | 5 | 2 |
| Normal\_Weight | 3 | 36 | 2 | 2 | 1 | 8 | 3 |
| Obesity\_Type\_I | 0 | 7 | 58 | 4 | 0 | 11 | 14 |
| Obesity\_Type\_II | 0 | 2 | 13 | 66 | 0 | 5 | 3 |
| Obesity\_Type\_III | 0 | 0 | 2 | 0 | 80 | 0 | 0 |
| Overweight\_Level\_I | 4 | 6 | 5 | 1 | 0 | 37 | 9 |
| Overweight\_Level\_II | 1 | 7 | 7 | 1 | 0 | 6 | 41 |

Classification Matrix for RF

| Class | Insufficient\_Weight | Normal\_Weight | Obesity\_Type\_I | Obesity\_Type\_II | Obesity\_Type\_III | Overweight\_Level\_I | Overweight\_Level\_II |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 67 | 1 | 0 | 0 | 0 | 0 | 0 |
| Normal\_Weight | 1 | 63 | 0 | 0 | 0 | 4 | 0 |
| Obesity\_Type\_I | 0 | 0 | 85 | 2 | 0 | 0 | 0 |
| Obesity\_Type\_II | 0 | 0 | 0 | 71 | 1 | 0 | 0 |
| Obesity\_Type\_III | 0 | 0 | 0 | 1 | 80 | 0 | 0 |
| Overweight\_Level\_I | 0 | 7 | 0 | 0 | 0 | 68 | 0 |
| Overweight\_Level\_II | 0 | 0 | 2 | 0 | 0 | 0 | 72 |

Performance of the classifiers

| Evaluation Criteria | RF | LR | SVM | KNN |
| --- | --- | --- | --- | --- |
| Correctly classified instances | 506 | 483 | 416 | 378 |
| Incorrectly Classified Instances | 19 | 42 | 109 | 147 |
| Accuracy (%) | 96.38 | 92 | 79.24 | 72 |

Comparison of accuracy Measure for LR,SVM,KNN,RF

| Class | Sensitivity | Specificity | Precision | Recall | F-score |
| --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 0.89 | 0.98 | 0.98 | 0.89 | 0.93 |
| Normal\_Weight | 0.80 | 0.98 | 0.98 | 0.8 | 0.88 |
| Obesity\_Type\_I | 0.91 | 0.98 | 0.98 | 0.91 | 0.94 |
| Obesity\_Type\_II | 0.95 | 0.99 | 0.99 | 0.95 | 0.97 |
| Obesity\_Type\_III | 0.97 | 0.99 | 0.99 | 0.97 | 0.98 |
| Overweight\_Level\_I | 0.93 | 0.98 | 0.98 | 0.93 | 0.95 |
| Overweight\_Level\_II | 0.94 | 0.98 | 0.98 | 0.94 | 0.96 |

| Class | Sensitivity | Specificity | Precision | Recall | F-score |
| --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 0.98 | 0.99 | 0.99 | 0.98 | 0.98 |
| Normal\_Weight | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Obesity\_Type\_I | 0.77 | 0.98 | 0.97 | 0.77 | 0.86 |
| Obesity\_Type\_II | 0.97 | 0.99 | 0.99 | 0.97 | 0.97 |
| Obesity\_Type\_III | 1 | 1 | 1 | 1 | 1 |
| Overweight\_Level\_I | 0 | 1 | 0 | 0 | 0 |
| Overweight\_Level\_II | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |

| Class | Sensitivity | Specificity | Precision | Recall | F-score |
| --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 0.88 | 0.96 | 0.96 | 0.88 | 0.92 |
| Normal\_Weight | 0.5 | 0.96 | 0.93 | 0.5 | 0.65 |
| Obesity\_Type\_I | 0.67 | 0.92 | 0.89 | 0.67 | 0.77 |
| Obesity\_Type\_II | 0.89 | 0.95 | 0.95 | 0.89 | 0.92 |
| Obesity\_Type\_III | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Overweight\_Level\_I | 0.51 | 0.94 | 0.89 | 0.51 | 0.65 |
| Overweight\_Level\_II | 0.57 | 0.95 | 0.92 | 0.57 | 0.70 |

| Class | Sensitivity | Specificity | Precision | Recall | F-score |
| --- | --- | --- | --- | --- | --- |
| Insufficient\_Weight | 0.98 | 0.99 | 0.99 | 0.98 | 0.98 |
| Normal\_Weight | 0.89 | 0.99 | 0.99 | 0.89 | 0.94 |
| Obesity\_Type\_I | 0.98 | 0.99 | 0.99 | 0.98 | 0.98 |
| Obesity\_Type\_II | 0.96 | 0.99 | 0.99 | 0.96 | 0.97 |
| Obesity\_Type\_III | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Overweight\_Level\_I | 0.94 | 0.98 | 0.98 | 0.94 | 0.96 |
| Overweight\_Level\_II | 1 | 0.99 | 0.99 | 1 | 0.99 |

