Feature Descriptor: LBP\_hf

1. Feature Selection: CFS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.588 | 0.603 | 0.603 | 0.611 | 0.613 | 0.599 | 0 |
| J48 binary tree | 0.548 | 0.527 | 0.527 | 0.529 | 0.529 | 0.527 | 0 |
| AODE | 0.773 | 0.71 | 0.71 | 0.717 | 0.71 | 0.709 | 0 |
| Bayes network | 0.754 | 0.664 | 0.664 | 0.665 | 0.666 | 0.664 | 0 |
| Naïve bay | 0.754 | 0.664 | 0.664 | 0.663 | 0.667 | 0.664 | 0 |
| SVM | 0.524 | 0.542 | 0.542 | 0.506 | 0.757 | 0.404 | 0 |
| Logistic | 0.575 | 0.55 | 0.55 | 0.55 | 0.551 | 0.55 | 0 |
| SMO | 0.557 | 0.557 | 0.557 | 0.557 | 0.558 | 0.557 | 0 |
| Muti layer | 0.669 | 0.565 | 0.565 | 0.548 | 0.567 | 0.565 | 5.21 |

1. Feature Selection: Chi-Square

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.546 | 0.542 | 0.542 | 0.543 | 0.543 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.14 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer |  |  |  |  |  |  |  |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.546 | 0.542 | 0.542 | 0.543 | 0.543 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.14 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer |  |  |  |  |  |  |  |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.546 | 0.542 | 0.542 | 0.543 | 0.543 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.14 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer |  |  |  |  |  |  |  |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.546 | 0.542 | 0.542 | 0.543 | 0.543 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.14 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer |  |  |  |  |  |  |  |

1. Feature Selection: Gain Ratio

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.551 | 0.542 | 0.542 | 0.544 | 0.544 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.624 | 0.588 | 0.588 | 0.588 | 0.588 | 0.588 | 90.59 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.551 | 0.542 | 0.542 | 0.544 | 0.544 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.624 | 0.588 | 0.588 | 0.588 | 0.588 | 0.588 | 90.59 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.551 | 0.542 | 0.542 | 0.544 | 0.544 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.624 | 0.588 | 0.588 | 0.588 | 0.588 | 0.588 | 90.59 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.551 | 0.542 | 0.542 | 0.544 | 0.544 | 0.542 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.624 | 0.588 | 0.588 | 0.588 | 0.588 | 0.588 | 76.85 |

1. Feature Selection: Information Gain

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.58 | 0.573 | 0.573 | 0.575 | 0.575 | 0.572 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.627 | 0.595 | 0.595 | 0.595 | 0.596 | 0.596 | 98.01 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.58 | 0.573 | 0.573 | 0.575 | 0.575 | 0.572 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.627 | 0.595 | 0.595 | 0.595 | 0.596 | 0.596 | 98.01 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.58 | 0.573 | 0.573 | 0.575 | 0.575 | 0.572 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer |  |  |  |  |  |  |  |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.58 | 0.573 | 0.573 | 0.575 | 0.575 | 0.572 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.627 | 0.595 | 0.595 | 0.595 | 0.596 | 0.596 | 98.01 |

1. Feature Selection: Relief

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.508 | 0.489 | 0.489 | 0.49 | 0.49 | 0.489 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 98.01 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.508 | 0.489 | 0.489 | 0.49 | 0.49 | 0.489 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 98.01 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.508 | 0.489 | 0.489 | 0.49 | 0.49 | 0.489 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 98.01 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.549 | 0.519 | 0.519 | 0.525 | 0.524 | 0.516 | 0 |
| J48 binary tree | 0.508 | 0.489 | 0.489 | 0.49 | 0.49 | 0.489 | 0 |
| AODE | 0.642 | 0.557 | 0.557 | 0.558 | 0.558 | 0.557 | 0 |
| Bayes network | 0.638 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| Naïve bay | 0.635 | 0.603 | 0.603 | 0.612 | 0.616 | 0.598 | 0 |
| SVM | 0.5 | 0.519 | 0.519 | 0.481 | 0.269 | 0.355 | 0 |
| Logistic | 0.643 | 0.626 | 0.626 | 0.63 | 0.63 | 0.625 | 0.12 |
| SMO | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 0.03 |
| Muti layer | 0.572 | 0.573 | 0.573 | 0.572 | 0.573 | 0.573 | 98.01 |