**Overlap MAX：Overlap 10% ~ 90%的最大值； P：異常資料參雜比例；K：特徵子集數；**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P = 10%** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** |
| **HRSS** | **87.13** | **72.86** | **72.01** | **92.39** | **92.00** | **87.13** | **67.43** | **63.74** | **88.28** | **93.69** | **87.13** | **63.57** | **62.48** | **91.74** | **93.94** |
| **MI-F** | **50.34** | **46.63** | **53.17** | **49.32** | **50.69** | **50.34** | **46.41** | **40.91** | **48.77** | **51.79** | **50.34** | **46.24** | **48.33** | **52.61** | **50.01** |
| **MI-V** | **77.15** | **70.87** | **58.32** | **77.69** | **78.66** | **77.15** | **69.25** | **59.61** | **79.49** | **85.70** | **77.15** | **68.80** | **58.47** | **79.07** | **85.38** |
| **OPTDIGITS** | **94.57** | **91.57** | **92.35** | **99.46** | **99.63** | **94.57** | **88.23** | **83.87** | **99.38** | **99.54** | **94.57** | **84.05** | **85.87** | **98.99** | **99.03** |
| **PENDIGITS** | **99.56** | **98.14** | **91.35** | **99.09** | **99.95** | **99.56** | **85.52** | **84.27** | **99.46** | **99.94** | **99.56** | **78.23** | **79.58** | **98.81** | **99.86** |
| **SATELLITE** | **51.05** | **72.70** | **68.78** | **64.93** | **68.73** | **51.05** | **84.74** | **87.63** | **72.06** | **77.93** | **51.05** | **95.39** | **92.06** | **73.71** | **73.95** |
| **SHUTTLE** | **39.34** | **99.83** | **27.95** | **47.82** | **96.93** | **39.34** | **93.58** | **91.90** | **77.93** | **98.49** | **39.34** | **98.68** | **99.43** | **85.70** | **99.53** |
| **THYROID** | **71.36** | **89.73** | **78.80** | **82.26** | **87.98** | **71.36** | **86.74** | **84.26** | **90.13** | **85.19** | **71.36** | **90.18** | **82.55** | **85.05** | **91.02** |

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| **P = 30%** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** |
| **HRSS** | **78.33** | **68.20** | **67.27** | **81.18** | **83.78** | **78.33** | **64.02** | **61.21** | **86.37** | **86.85** | **78.33** | **58.84** | **59.64** | **87.15** | **88.82** |
| **MI-F** | **46.54** | **41.06** | **45.40** | **45.48** | **44.95** | **46.54** | **42.71** | **41.56** | **42.64** | **46.53** | **46.54** | **43.83** | **44.41** | **46.40** | **44.89** |
| **MI-V** | **64.10** | **63.21** | **65.18** | **68.50** | **67.18** | **64.10** | **63.82** | **62.71** | **69.97** | **70.72** | **64.10** | **64.31** | **65.59** | **72.94** | **71.83** |
| **OPTDIGITS** | **68.44** | **70.39** | **83.23** | **64.64** | **66.37** | **68.44** | **77.13** | **71.23** | **71.84** | **80.97** | **68.44** | **83.92** | **71.18** | **75.57** | **86.43** |
| **PENDIGITS** | **53.95** | **84.95** | **81.84** | **64.87** | **76.11** | **53.95** | **77.50** | **73.88** | **81.80** | **90.73** | **53.95** | **71.03** | **76.88** | **79.11** | **92.34** |
| **SATELLITE** | **45.64** | **69.49** | **59.78** | **58.17** | **63.48** | **45.64** | **83.59** | **85.43** | **62.64** | **67.14** | **45.64** | **90.47** | **88.48** | **64.83** | **64.34** |
| **SHUTTLE** | **90.22** | **94.55** | **94.03** | **86.80** | **86.95** | **90.22** | **76.23** | **93.09** | **85.34** | **87.14** | **90.22** | **85.12** | **98.87** | **86.96** | **93.44** |
| **THYROID** | **70.09** | **80.55** | **68.95** | **84.05** | **95.25** | **70.09** | **77.64** | **81.17** | **86.70** | **86.12** | **70.09** | **80.68** | **80.17** | **80.73** | **87.08** |

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| **P = 50%** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** | **Origin** | **Random** | **Kmeans** | **Overlap**  **50%** | **Overlap**  **MAX** |
| **HRSS** | **70.10** | **63.72** | **62.44** | **73.08** | **81.26** | **70.10** | **62.66** | **61.22** | **82.85** | **83.23** | **70.10** | **57.24** | **57.42** | **80.46** | **83.45** |
| **MI-F** | **47.19** | **41.55** | **41.14** | **43.60** | **43.78** | **47.19** | **42.21** | **44.20** | **42.36** | **41.90** | **47.19** | **41.47** | **40.00** | **43.00** | **41.27** |
| **MI-V** | **59.85** | **58.99** | **63.58** | **43.43** | **64.64** | **59.85** | **61.51** | **47.32** | **63.05** | **66.68** | **59.85** | **61.99** | **54.26** | **65.39** | **67.43** |
| **OPTDIGITS** | **50.49** | **69.92** | **68.98** | **36.15** | **56.78** | **50.49** | **70.76** | **71.13** | **43.57** | **67.35** | **50.49** | **70.68** | **74.38** | **41.51** | **68.79** |
| **PENDIGITS** | **25.20** | **77.47** | **57.82** | **47.84** | **46.19** | **25.20** | **86.28** | **64.22** | **53.65** | **78.16** | **25.20** | **69.10** | **70.58** | **55.39** | **73.54** |
| **SATELLITE** | **49.94** | **62.99** | **62.47** | **53.71** | **57.39** | **49.94** | **80.21** | **73.69** | **58.61** | **60.39** | **49.94** | **86.85** | **81.01** | **63.13** | **61.83.** |
| **SHUTTLE** | **86.11** | **86.99** | **80.48** | **88.72** | **86.13** | **86.11** | **68.33** | **98.51** | **77.56** | **80.18** | **86.11** | **76.78** | **81.68** | **87.68** | **89.51** |
| **THYROID** | **66.38** | **79.62** | **72.20** | **82.31** | **79.39** | **66.38** | **85.14** | **81.59** | **84.03** | **85.73** | **66.38** | **79.25** | **76.17** | **76.55** | **89.15** |

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| **Feature Subsets** | **P = 10** | | | | **P = 30** | | | | **P = 50** | | | |
| **Dataset** |  | **K = 3** | **K = 6** | **K = 9** |  | **K = 3** | **K = 6** | **K = 9** |  | **K = 3** | **K = 6** | **K = 9** |
| **HRSS** | **87.13** | **92.00** | **93.69** | **93.94** | **78.33** | **83.78** | **86.85** | **88.82** | **70.10** | **81.26** | **83.23** | **83.45** |
| **MI-F** | **50.34** | **50.69** | **51.79** | **50.01** | **46.54** | **44.95** | **46.53** | **44.89** | **47.19** | **43.78** | **41.90** | **41.27** |
| **MI-V** | **77.15** | **77.66** | **85.70** | **85.38** | **64.10** | **67.18** | **70.72** | **71.83** | **59.85** | **64.64** | **66.68** | **67.43** |
| **OPTDIGITS** | **94.57** | **99.63** | **99.54** | **99.03** | **68.44** | **66.37** | **80.97** | **86.43** | **50.49** | **56.78** | **67.35** | **68.79** |
| **PENDIGITS** | **99.56** | **99.95** | **99.94** | **99.86** | **53.95** | **76.11** | **90.73** | **92.34** | **25.20** | **46.19** | **78.16** | **73.54** |
| **SATELLITE** | **51.05** | **68.73** | **76.33** | **73.95** | **45.64** | **63.48** | **67.14** | **64.34** | **49.94** | **57.39** | **60.39** | **61.83.** |
| **SHUTTLE** | **39.34** | **96.93** | **98.49** | **99.53** | **90.22** | **86.95** | **87.14** | **93.44** | **86.11** | **86.13** | **80.18** | **89.51** |
| **THYROID** | **71.36** | **87.98** | **85.19** | **91.02** | **70.09** | **95.25** | **86.12** | **87.08** | **66.38** | **79.39** | **85.73** | **89.15** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P = 10** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** |
| **OPTDIGITS** | **99.46** | **97.99** | **99.68** | **98.48** | **99.68** | **99.38** | **99.37** | **95.09** | **91.22** | **99.82** | **98.99** | **97.66** | **98.34** | **93.59** | **99.61** |
| **PENDIGITS** | **99.09** | **97.61** | **94.75** | **98.71** | **96.52** | **99.46** | **98.33** | **99.68** | **96.14** | **98.13** | **98.81** | **96.81** | **97.15** | **96.49** | **98.23** |
| **SATELLITE** | **64.93** | **71.85** | **74.57** | **59.13** | **66.19** | **72.06** | **78.09** | **78.66** | **51.63** | **68.39** | **73.71** | **79.20** | **84.20** | **65.01** | **71.44** |
| **THYROID** | **82.26** | **83.84** | **82.97** | **83.60** | **79.97** | **90.13** | **93.47** | **93.97** | **90.80** | **90.51** | **85.05** | **88.13** | **88.95** | **88.40** | **80.86** |
| **P = 30** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** |
| **OPTDIGITS** | **64.64** | **66.02** | **79.89** | **73.86** | **71.49** | **71.84** | **77.28** | **86.87** | **72.61** | **83.30** | **75.57** | **78.13** | **82.37** | **64.02** | **82.06** |
| **PENDIGITS** | **64.87** | **74.16** | **77.57** | **71.13** | **66.79** | **81.80** | **77.11** | **79.88** | **86.08** | **70.79** | **79.11** | **81.85** | **80.51** | **77.53** | **69.45** |
| **SATELLITE** | **58.17** | **65.52** | **75.11** | **66.71** | **56.80** | **62.64** | **65.48** | **76.09** | **74.24** | **59.90** | **64.83** | **67.78** | **72.54** | **75.54** | **60.72** |
| **THYROID** | **84.05** | **85.05** | **84.14** | **83.69** | **83.26** | **86.70** | **89.68** | **90.36** | **88.35** | **87.21** | **80.73** | **82.78** | **80.74** | **81.73** | **79.57** |
| **P =50** | **K= 3** | | | | | **K = 6** | | | | | **K = 9** | | | | |
| **Dataset** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** | **Origin** | **MLP** | **TF+**  **MLP** | **ATT+**  **MLP** | **GAT** |
| **OPTDIGITS** | **36.15** | **41.49** | **56.46** | **63.74** | **37.48** | **43.57** | **55.70** | **68.46** | **38.74** | **47.95** | **41.51** | **53.70** | **54.74** | **50.43** | **49.16** |
| **PENDIGITS** | **47.84** | **52.11** | **61.82** | **59.13** | **32.29** | **53.65** | **55.28** | **67.46** | **51.63** | **45.17** | **55.39** | **58.76** | **67.01** | **65.01** | **42.75** |
| **SATELLITE** | **53.71** | **61.96** | **72.14** | **64.17** | **49.73** | **58.61** | **63.73** | **65.95** | **66.31** | **52.97** | **63.13** | **67.64** | **71.52** | **67.91** | **53.35** |
| **THYROID** | **82.31** | **84.45** | **82.66** | **85.88** | **85.13** | **84.03** | **84.86** | **86.51** | **84.66** | **85.86** | **76.55** | **81.30** | **81.66** | **76.72** | **79.65** |

**Target 2**

**Transformer**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Feature Subsets** | **P = 50** | | | | **P = 70** | | | | **P = 90** | | | |
| **Dataset** |  | **K = 3** | **K = 6** | **K = 9** |  | **K = 3** | **K = 6** | **K = 9** |  | **K = 3** | **K = 6** | **K = 9** |
| **HRSS** | **82.49** |  |  |  | **86.66** |  |  |  | **90.39** |  |  |  |
| **MI-F** | **84.11** |  |  |  | **82.22** |  |  |  | **84.16** |  |  |  |
| **MI-V** | **95.33** |  |  |  | **95.61** |  |  |  | **96.41** |  |  |  |
| **OPTDIGITS** | **99.39** | **98.50** | **99.26** | **98.26** | **99.44** | **98.73** | **99.85** | **99.92** | **99.44** | **99.25** | **99.02** | **96.67** |
| **PENDIGITS** | **99.84** | **100.00** | **98.13** | **99.35** | **99.84** | **99.64** |  |  | **99.83** |  |  |  |
| **SATELLITE** | **84.14** | **91.47** | **97.26** | **94.77** | **84.61** | **92.70** | **93.59** | **95.95** | **86.01** | **97.05** | **95.93** | **94.43** |
| **SHUTTLE** | **99.86** | **99.82** |  |  | **99.97** |  |  |  | **99.94** |  |  |  |
| **THYROID** | **87.93** | **91.85** | **96.30** | **93.18** | **85.23** | **89.53** | **92.83** | **93.52** | **83.68** | **92.57** | **95.18** | **92.22** |