**Sixth Assignment**

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**1:**

For SAT11-INDU/algorithm\_runs.arff

Oracle: 8187.51781821

SB: 14605.9042559

For SAT11-RAND/algorithm\_runs.arff

Oracle: 9186.440565

SB: 19916.3559331

**2:**

For SAT11-INDU/algorithm\_runs.arff

Test Run: 1

* Avg Runtime: 15126.842607, Timeouts: 84
* Assignment: {'minisathackLR\_GL\_SHR\_2011-03-02': 10.0, 'SAT09referencesolverprecosat\_236': 265.0, 'SAT09referencesolverglucose\_1.0': 10.0, 'minisathackMiniSAT\_2.2.0-agile-26': 70.0, 'CryptoMiniSat\_Strange-Night2-st\_fixed\_': 10.0, 'minisathackminisat\_psm\_2011-04-01': 10.0, 'EBGlucose\_1.0': 10.0, 'QuteRSat\_2011-05-12\_fixed\_': 2044.0, 'minisathackcir\_minisat\_2011-05-13\_simp\_': 10.0, 'RestartSAT\_B95': 2103.0, 'minisathackcontrasat\_2011-03-02': 32.0, 'minisathackreferenceminisat\_2.2.0': 130.0, 'Lingeling\_587f\_fixed\_': 10.0, 'MPhaseSAT64\_2011-05-14\_fixed\_': 10.0, 'rcl\_2011-04-01': 10.0, 'minisathackEBMiniSAT\_2011-03-02': 10.0, 'glucose\_2': 100.0, 'glueminisat\_2.2.5': 114.0}
* Permutation: ['minisathackLR\_GL\_SHR\_2011-03-02', 'glueminisat\_2.2.5', 'minisathackcontrasat\_2011-03-02', 'minisathackreferenceminisat\_2.2.0', 'glucose\_2', 'minisathackMiniSAT\_2.2.0-agile-26', 'rcl\_2011-04-01', 'SAT09referencesolverglucose\_1.0', 'EBGlucose\_1.0', 'MPhaseSAT64\_2011-05-14\_fixed\_', 'QuteRSat\_2011-05-12\_fixed\_', 'minisathackcir\_minisat\_2011-05-13\_simp\_', 'minisathackEBMiniSAT\_2011-03-02', 'Lingeling\_587f\_fixed\_', 'minisathackminisat\_psm\_2011-04-01', 'SAT09referencesolverprecosat\_236', 'RestartSAT\_B95', 'CryptoMiniSat\_Strange-Night2-st\_fixed\_']

Test Run: 2

* Avg Runtime: 14318.720200, Timeouts: 79
* Assignment: {'minisathackLR\_GL\_SHR\_2011-03-02': 10.0, 'SAT09referencesolverprecosat\_236': 91.0, 'SAT09referencesolverglucose\_1.0': 10.0, 'minisathackMiniSAT\_2.2.0-agile-26': 10.0, 'CryptoMiniSat\_Strange-Night2-st\_fixed\_': 2497.0, 'minisathackminisat\_psm\_2011-04-01': 10.0, 'EBGlucose\_1.0': 10.0, 'QuteRSat\_2011-05-12\_fixed\_': 10.0, 'minisathackcir\_minisat\_2011-05-13\_simp\_': 10.0, 'RestartSAT\_B95': 10.0, 'minisathackcontrasat\_2011-03-02': 10.0, 'minisathackreferenceminisat\_2.2.0': 1782.0, 'Lingeling\_587f\_fixed\_': 10.0, 'MPhaseSAT64\_2011-05-14\_fixed\_': 10.0, 'rcl\_2011-04-01': 10.0, 'minisathackEBMiniSAT\_2011-03-02': 10.0, 'glucose\_2': 493.0, 'glueminisat\_2.2.5': 10.0}
* Permutation: ['glucose\_2', 'minisathackLR\_GL\_SHR\_2011-03-02', 'minisathackminisat\_psm\_2011-04-01', 'minisathackreferenceminisat\_2.2.0', 'EBGlucose\_1.0', 'minisathackEBMiniSAT\_2011-03-02', 'SAT09referencesolverglucose\_1.0', 'MPhaseSAT64\_2011-05-14\_fixed\_', 'minisathackMiniSAT\_2.2.0-agile-26', 'CryptoMiniSat\_Strange-Night2-st\_fixed\_', 'glueminisat\_2.2.5', 'SAT09referencesolverprecosat\_236', 'rcl\_2011-04-01', 'minisathackcontrasat\_2011-03-02', 'QuteRSat\_2011-05-12\_fixed\_', 'Lingeling\_587f\_fixed\_', 'RestartSAT\_B95', 'minisathackcir\_minisat\_2011-05-13\_simp\_']

Test Run: 3

* Avg Runtime: 14943.746384, Timeouts: 83
* Assignment: {'minisathackLR\_GL\_SHR\_2011-03-02': 10.0, 'SAT09referencesolverprecosat\_236': 10.0, 'SAT09referencesolverglucose\_1.0': 10.0, 'minisathackMiniSAT\_2.2.0-agile-26': 10.0, 'CryptoMiniSat\_Strange-Night2-st\_fixed\_': 689.0, 'minisathackminisat\_psm\_2011-04-01': 10.0, 'EBGlucose\_1.0': 10.0, 'QuteRSat\_2011-05-12\_fixed\_': 10.0, 'minisathackcir\_minisat\_2011-05-13\_simp\_': 10.0, 'RestartSAT\_B95': 513.0, 'minisathackcontrasat\_2011-03-02': 10.0, 'minisathackreferenceminisat\_2.2.0': 100.0, 'Lingeling\_587f\_fixed\_': 10.0, 'MPhaseSAT64\_2011-05-14\_fixed\_': 10.0, 'rcl\_2011-04-01': 356.0, 'minisathackEBMiniSAT\_2011-03-02': 10.0, 'glucose\_2': 10.0, 'glueminisat\_2.2.5': 3285.0}
* Permutation: ['minisathackMiniSAT\_2.2.0-agile-26', 'RestartSAT\_B95', 'glueminisat\_2.2.5', 'QuteRSat\_2011-05-12\_fixed\_', 'SAT09referencesolverprecosat\_236', 'minisathackcontrasat\_2011-03-02', 'SAT09referencesolverglucose\_1.0', 'CryptoMiniSat\_Strange-Night2-st\_fixed\_', 'EBGlucose\_1.0', 'Lingeling\_587f\_fixed\_', 'minisathackminisat\_psm\_2011-04-01', 'minisathackEBMiniSAT\_2011-03-02', 'glucose\_2', 'rcl\_2011-04-01', 'minisathackLR\_GL\_SHR\_2011-03-02', 'minisathackcir\_minisat\_2011-05-13\_simp\_', 'MPhaseSAT64\_2011-05-14\_fixed\_', 'minisathackreferenceminisat\_2.2.0']

Test Run: 4

* Avg Runtime: 14749.158290, Timeouts: 82
* Assignment: {'minisathackLR\_GL\_SHR\_2011-03-02': 10.0, 'SAT09referencesolverprecosat\_236': 20.0, 'SAT09referencesolverglucose\_1.0': 10.0, 'minisathackMiniSAT\_2.2.0-agile-26': 659.0, 'CryptoMiniSat\_Strange-Night2-st\_fixed\_': 3029.0, 'minisathackminisat\_psm\_2011-04-01': 10.0, 'EBGlucose\_1.0': 10.0, 'QuteRSat\_2011-05-12\_fixed\_': 10.0, 'minisathackcir\_minisat\_2011-05-13\_simp\_': 10.0, 'RestartSAT\_B95': 577.0, 'minisathackcontrasat\_2011-03-02': 10.0, 'minisathackreferenceminisat\_2.2.0': 10.0, 'Lingeling\_587f\_fixed\_': 10.0, 'MPhaseSAT64\_2011-05-14\_fixed\_': 190.0, 'rcl\_2011-04-01': 10.0, 'minisathackEBMiniSAT\_2011-03-02': 10.0, 'glucose\_2': 277.0, 'glueminisat\_2.2.5': 10.0}
* Permutation: ['SAT09referencesolverprecosat\_236', 'minisathackcir\_minisat\_2011-05-13\_simp\_', 'minisathackminisat\_psm\_2011-04-01', 'QuteRSat\_2011-05-12\_fixed\_', 'glueminisat\_2.2.5', 'EBGlucose\_1.0', 'minisathackMiniSAT\_2.2.0-agile-26', 'MPhaseSAT64\_2011-05-14\_fixed\_', 'minisathackcontrasat\_2011-03-02', 'minisathackEBMiniSAT\_2011-03-02', 'rcl\_2011-04-01', 'Lingeling\_587f\_fixed\_', 'glucose\_2', 'minisathackLR\_GL\_SHR\_2011-03-02', 'RestartSAT\_B95', 'minisathackreferenceminisat\_2.2.0', 'CryptoMiniSat\_Strange-Night2-st\_fixed\_', 'SAT09referencesolverglucose\_1.0']

Test Run: 5

* Avg Runtime: 14393.463157, Timeouts: 80
* Assignment: {'minisathackLR\_GL\_SHR\_2011-03-02': 119.0, 'SAT09referencesolverprecosat\_236': 170.0, 'SAT09referencesolverglucose\_1.0': 10.0, 'minisathackMiniSAT\_2.2.0-agile-26': 637.0, 'CryptoMiniSat\_Strange-Night2-st\_fixed\_': 2924.0, 'minisathackminisat\_psm\_2011-04-01': 10.0, 'EBGlucose\_1.0': 10.0, 'QuteRSat\_2011-05-12\_fixed\_': 10.0, 'minisathackcir\_minisat\_2011-05-13\_simp\_': 10.0, 'RestartSAT\_B95': 10.0, 'minisathackcontrasat\_2011-03-02': 10.0, 'minisathackreferenceminisat\_2.2.0': 10.0, 'Lingeling\_587f\_fixed\_': 10.0, 'MPhaseSAT64\_2011-05-14\_fixed\_': 10.0, 'rcl\_2011-04-01': 10.0, 'minisathackEBMiniSAT\_2011-03-02': 10.0, 'glucose\_2': 720.0, 'glueminisat\_2.2.5': 10.0}
* Permutation: ['minisathackMiniSAT\_2.2.0-agile-26', 'QuteRSat\_2011-05-12\_fixed\_', 'rcl\_2011-04-01', 'SAT09referencesolverprecosat\_236', 'EBGlucose\_1.0', 'glucose\_2', 'RestartSAT\_B95', 'minisathackminisat\_psm\_2011-04-01', 'minisathackcir\_minisat\_2011-05-13\_simp\_', 'minisathackLR\_GL\_SHR\_2011-03-02', 'MPhaseSAT64\_2011-05-14\_fixed\_', 'minisathackreferenceminisat\_2.2.0', 'minisathackcontrasat\_2011-03-02', 'glueminisat\_2.2.5', 'minisathackEBMiniSAT\_2011-03-02', 'SAT09referencesolverglucose\_1.0', 'CryptoMiniSat\_Strange-Night2-st\_fixed\_', 'Lingeling\_587f\_fixed\_']

For SAT11-RAND/algorithm\_runs.arff

Test Run: 1

* Avg Runtime: 12845.198395, Timeouts: 127
* Assignment: {'EagleUP\_1.565.350': 10.0, 'MPhaseSAT\_M\_2011-02-16': 10.0, 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02': 1562.0, 'sattime2011\_2011-03-02': 10.0, 'SAT09referencesolvermarch\_hi\_hi': 10.0, 'SAT09referencesolvergnovelty+2\_2009-03-22': 10.0, 'SAT09referencesolverTNM\_2009-03-22': 10.0, 'adaptg2wsat2011\_2011-03-02': 10.0, 'march\_rw\_2011-03-02': 4458.0}
* Permutation: ['SAT09referencesolvermarch\_hi\_hi', 'sattime2011\_2011-03-02', 'EagleUP\_1.565.350', 'MPhaseSAT\_M\_2011-02-16', 'march\_rw\_2011-03-02', 'SAT09referencesolverTNM\_2009-03-22', 'adaptg2wsat2011\_2011-03-02', 'SAT09referencesolvergnovelty+2\_2009-03-22', 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02']

Test Run: 2

* Avg Runtime: 12229.949503, Timeouts: 127
* Assignment: {'EagleUP\_1.565.350': 610.0, 'MPhaseSAT\_M\_2011-02-16': 10.0, 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02': 2241.0, 'sattime2011\_2011-03-02': 10.0, 'SAT09referencesolvermarch\_hi\_hi': 2062.0, 'SAT09referencesolvergnovelty+2\_2009-03-22': 10.0, 'SAT09referencesolverTNM\_2009-03-22': 10.0, 'adaptg2wsat2011\_2011-03-02': 10.0, 'march\_rw\_2011-03-02': 10.0}
* Permutation: ['SAT09referencesolvermarch\_hi\_hi', 'MPhaseSAT\_M\_2011-02-16', 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02', 'SAT09referencesolverTNM\_2009-03-22', 'EagleUP\_1.565.350', 'march\_rw\_2011-03-02', 'SAT09referencesolvergnovelty+2\_2009-03-22', 'sattime2011\_2011-03-02', 'adaptg2wsat2011\_2011-03-02']

Test Run: 3

* Avg Runtime: 12200.249711, Timeouts: 127
* Assignment: {'EagleUP\_1.565.350': 453.0, 'MPhaseSAT\_M\_2011-02-16': 10.0, 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02': 2579.0, 'sattime2011\_2011-03-02': 10.0, 'SAT09referencesolvermarch\_hi\_hi': 23.0, 'SAT09referencesolvergnovelty+2\_2009-03-22': 10.0, 'SAT09referencesolverTNM\_2009-03-22': 10.0, 'adaptg2wsat2011\_2011-03-02': 10.0, 'march\_rw\_2011-03-02': 1941.0}
* Permutation: ['EagleUP\_1.565.350', 'MPhaseSAT\_M\_2011-02-16', 'SAT09referencesolverTNM\_2009-03-22', 'sattime2011\_2011-03-02', 'SAT09referencesolvergnovelty+2\_2009-03-22', 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02', 'SAT09referencesolvermarch\_hi\_hi', 'adaptg2wsat2011\_2011-03-02', 'march\_rw\_2011-03-02']

Test Run: 4

* Avg Runtime: 12272.759740, Timeouts: 128
* Assignment: {'EagleUP\_1.565.350': 428.0, 'MPhaseSAT\_M\_2011-02-16': 10.0, 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02': 2240.0, 'sattime2011\_2011-03-02': 10.0, 'SAT09referencesolvermarch\_hi\_hi': 2058.0, 'SAT09referencesolvergnovelty+2\_2009-03-22': 10.0, 'SAT09referencesolverTNM\_2009-03-22': 39.0, 'adaptg2wsat2011\_2011-03-02': 27.0, 'march\_rw\_2011-03-02': 10.0}
* Permutation: ['sattime2011\_2011-03-02', 'EagleUP\_1.565.350', 'march\_rw\_2011-03-02', 'SAT09referencesolverTNM\_2009-03-22', 'SAT09referencesolvergnovelty+2\_2009-03-22', 'adaptg2wsat2011\_2011-03-02', 'MPhaseSAT\_M\_2011-02-16', 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02', 'SAT09referencesolvermarch\_hi\_hi']

Test Run: 5

* Avg Runtime: 12225.402674, Timeouts: 127
* Assignment: {'EagleUP\_1.565.350': 688.0, 'MPhaseSAT\_M\_2011-02-16': 10.0, 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02': 2255.0, 'sattime2011\_2011-03-02': 10.0, 'SAT09referencesolvermarch\_hi\_hi': 10.0, 'SAT09referencesolvergnovelty+2\_2009-03-22': 10.0, 'SAT09referencesolverTNM\_2009-03-22': 10.0, 'adaptg2wsat2011\_2011-03-02': 10.0, 'march\_rw\_2011-03-02': 2014.0}
* Permutation: ['EagleUP\_1.565.350', 'MPhaseSAT\_M\_2011-02-16', 'adaptg2wsat2011\_2011-03-02', 'sparrow2011\_sparrow2011\_ubcsat1.2\_2011-03-02', 'SAT09referencesolverTNM\_2009-03-22', 'SAT09referencesolvermarch\_hi\_hi', 'sattime2011\_2011-03-02', 'march\_rw\_2011-03-02', 'SAT09referencesolvergnovelty+2\_2009-03-22']

**Feedback:**

1: We worked 2 hours on this question. We leaned how to calculate Single Best algorithm (SB) and the oracle performance and also how to calculate both of them. It was a perfect question to teach about Single Best algorithm and oracle.

2: Hours ~ 10 hours. We learned how to use SLS for algorithm schedules. Using SLS in this assignment was harder as compared to the third assignment.

3: We worked 12 hours on this question. We have now a very better understanding of algorithm selection and how to select algorithm for instances. Question 3 was tricky one and very long question and question was not so clear .it took us long time to understand this question,know what to solve in this question and how to solve. Unfortunately we are not able to solve this question in given time. First we are not clear how to apply CV on features and when we solve this problem then formatting the data according to Sklearn was difficult. This took us more time to format data for Sklearn. When we solved all of this problem we don't have more time to get result according to requirement.