**Report on**

**Local Search Offline**

**Course: CSE 318**

**Course Title: Artificial Intelligence Sessional**

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**Date of Submission: 21-01-2023**

**Data set for Exponential Penalty**:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Benchmark | Known Best Solution | |  |  | Scheme -1 | |  |
| Data |  |  |  | Largest Degree + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After Largest | After Kempe | After Pairswap |
|  |  |  |  |  | Degree |  |  |
| CARF92 | 32 | 3.74 | 32 |  | 9.4750 | 6.1531 | 5.670 |
| CARS91 | 35 | 4.42 | 34 |  | 10.4678 | 8.1409 | 7.3712 |
| KFU93 | 20 | 12.96 | 20 |  | 36.6533 | 22.2650 | 17.3249 |
| TRE92 | 23 | 7.75 | 23 |  | 14.1316 | 10.4855 | 10.1018 |
| YOR83 | 21 | 34.84 | 23 |  | 49.8299 | 40.9883 | 39.6163 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Benchmark | Known Best Solution | |  |  | Scheme -2 | |  |
| Data |  |  |  | Saturation Degree + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After | After Kempe | After Pairswap |
|  |  |  |  |  | Saturation |  |  |
|  |  |  |  |  | Degree |  |  |
| CARF92 | 32 | 3.74 | 31 |  | 8.9939 | 6.4141 | 5.9610 |
| CARS91 | 35 | 4.42 | 30 |  | 10.9712 | 9.2129 | 8.9771 |
| KFU93 | 20 | 12.96 | 21 |  | 31.1931 | 23.6681 | 17.8624 |
| TRE92 | 23 | 7.75 | 21 |  | 14.1004 | 12.1947 | 11.7506 |
| YOR83 | 21 | 34.84 | 23 |  | 49.5356 | 42.6578 | 41.7959 |
|  |  | |  |  |  | |  |
| Benchmark | Known Best Solution | |  |  | Scheme -3 | |  |
| Data |  |  |  | Largest Enrollment + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After Largest | After Kempe | After Pairswap |
|  |  |  |  |  | Enrollment |  |  |
| CARF92 | 32 | 3.74 | 35 |  | 9.6586 | 5.5720 | 5.0894 |
| CARS91 | 35 | 4.42 | 36 |  | 12.0478 | 7.3144 | 6.5844 |
| KFU93 | 20 | 12.96 | 21 |  | 40.3486 | 17.6978 | 15.4606 |
| TRE92 | 23 | 7.75 | 22 |  | 14.5181 | 11.0637 | 10.46788 |
| YOR83 | 21 | 34.84 | 25 |  | 48.5589 | 35.1625 | 35.4739 |

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| Benchmark | Known Best Solution | |  |  | Scheme -4 | |  |
| Data |  |  |  | Random Ordering + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After | After Kempe | After Pairswap |
|  |  |  |  |  | Random |  |  |
|  |  |  |  |  | Ordering |  |  |
| CARF92 | 32 | 3.74 | 44 |  | 7.2243 | 4.8921 | 4.2387 |
| CARS91 | 35 | 4.42 | 46 |  | 8.7262 | 6.0835 | 5.4153 |
| KFU93 | 20 | 12.96 | 27 |  | 29.9736 | 15.2323 | 13.4987 |
| TRE92 | 23 | 7.75 | 27 |  | 11.3233 | 9.42958 | 9.0779 |
| YOR83 | 21 | 34.84 | 25 |  | 44.2550 | 38.2008 | 37.5812 |

**Data set for Linear Penalty**:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Benchmark | Known Best Solution | |  |  | Scheme -5 | |  |
| Data |  |  |  | Largest Degree + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After Largest | After Kempe | After Pairswap |
|  |  |  |  |  | Degree |  |  |
| CARF92 | 32 | 3.74 | 32 |  | 5.8343 | 4.0878 | 3.6411 |
| CARS91 | 35 | 4.42 | 34 |  | 6.6138 | 5.0937 | 4.4781 |
| KFU93 | 20 | 12.96 | 20 |  | 20.6741 | 12.6161 | 10.6158 |
| TRE92 | 23 | 7.75 | 23 |  | 8.7504 | 6.7330 | 5.9903 |
| YOR83 | 21 | 34.84 | 23 |  | 28.7863 | 23.9298 | 23.3857 |
|  |  |  |  |  |  |  |  |

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| Benchmark | Known Best Solution | |  |  | Scheme -6 | |  |
| Data |  |  |  | Saturation Degree + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After | After Kempe | After Pairswap |
|  |  |  |  |  | Saturation |  |  |
|  |  |  |  |  | Degree |  |  |
| CARF92 | 32 | 3.74 | 31 |  | 5.5571 | 4.0679 | 3.5904 |
| CARS91 | 35 | 4.42 | 30 |  | 6.9012 | 5.6990 | 5.2620 |
| KFU93 | 20 | 12.96 | 21 |  | 19.2761 | 11.3542 | 9.9263 |
| TRE92 | 23 | 7.75 | 21 |  | 8.6903 | 7.656 | 7.1724 |
| YOR83 | 21 | 34.84 | 23 |  | 29.2454 | 22.5015 | 22.2167 |
|  |  | |  |  |  | |  |
| Benchmark | Known Best Solution | |  |  | Scheme -7 | |  |
| Data |  |  |  | Largest Enrollment + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After Largest | After Kempe | After Pairswap |
|  |  |  |  |  | Enrollment |  |  |
| CARF92 | 32 | 3.74 | 35 |  | 5.9172 | 3.7019 | 3.0902 |
| CARS91 | 35 | 4.42 | 36 |  | 7.4548 | 4.7034 | 4.0607 |
| KFU93 | 20 | 12.96 | 21 |  | 22.6083 | 10.8457 | 9.6186 |
| TRE92 | 23 | 7.75 | 22 |  | 9.0105 | 7.0848 | 6.7458 |
| YOR83 | 21 | 34.84 | 25 |  | 28.3273 | 20.3570 | 20.0148 |

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| Benchmark | Known Best Solution | |  |  | Scheme -8 | |  |
| Data |  |  |  | Random Ordering + Kempe + Pairswap | | | |
|  |  |  |  |  |  |  |  |
|  |  |  | Timeslots |  |  | Penalty |  |
|  | Timeslots | Penalty |  |  | After | After Kempe | After Pairswap |
|  |  |  |  |  | Random |  |  |
|  |  |  |  |  | Ordering |  |  |
| CARF92 | 32 | 3.74 | 43 |  | 4.4624 | 2.9206 | 2.4100 |
| CARS91 | 35 | 4.42 | 47 |  | 5.1296 | 3.4946 | 2.8586 |
| KFU93 | 20 | 12.96 | 23 |  | 15.9910 | 10.3914 | 8.2015 |
| TRE92 | 23 | 7.75 | 29 |  | 7.6513 | 5.6399 | 4.7935 |
| YOR83 | 21 | 34.84 | 29 |  | 24.0807 | 19.7895 | 18.4845 |