# Report

## Local Search Offline

## CSE 318
## Artificial Intelligence Sessional

Somonindro Roy
Id :  1805049
Section : A2
CSE , BUET

# For Exponential Penalty:

| Benchmark Data | Known Best Solution | | Scheme -1 Largest Degree + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Largest Degree | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 32 | 10.61528 | 6.30001 | 6.21076 |
| CARS91 | 35 | 4.42 | 34 | 11.49571 | 7.73489 | 7.62044 |
| KFU93 | 20 | 12.96 | 20 | 46.51598 | 19.14750 | 18.42755 |
| TRE92 | 23 | 7.75 | 23 | 15.90091 | 10.80298 | 10.60619 |
| YOR83 | 21 | 34.84 | 23 | 64.68862 | 40.12964 | 39.85015 |

| Benchmark Data | Known Best Solution | | Scheme -2 Saturation Degree + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Saturation Degree | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 32 | 9.83044 | 6.36560 | 6.22921 |
| CARS91 | 35 | 4.42 | 34 | 12.79350 | 8.32325 | 8.17943 |
| KFU93 | 20 | 12.96 | 20 | 47.06262 | 18.96653 | 18.22471 |
| TRE92 | 23 | 7.75 | 23 | 15.53165 | 10.61651 | 10.37729 |
| YOR83 | 21 | 34.84 | 22 | 63.75132 | 44.07013 | 44.05632 |

| Benchmark Data | Known Best Solution | | Scheme -3 Largest Enrollment + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Largest Enrollment | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 35 | 10.69602 | 5.73527 | 5.63244 |
| CARS91 | 35 | 4.42 | 36 | 13.78097 | 7.65175 | 7.53630 |
| KFU93 | 20 | 12.96 | 21 | 54.51205 | 19.82576 | 19.03084 |
| TRE92 | 23 | 7.75 | 22 | 16.32981 | 11.66422 | 11.53463 |
| YOR83 | 21 | 34.84 | 25 | 63.27098 | 34.33793 | 33.91710 |

| Benchmark Data | Known Best Solution | | Scheme -4 Random Ordering + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Random Ordering | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 44 | 8.03447 | 3.91394 | 3.81616 |
| CARS91 | 35 | 4.42 | 46 | 9.44691 | 5.41577 | 5.30298 |
| KFU93 | 20 | 12.96 | 25 | 34.78201 | 15.11927 | 13.72873 |
| TRE92 | 23 | 7.75 | 27 | 12.75894 | 8.35045 | 8.27522 |
| YOR83 | 21 | 34.84 | 27 | 51.32093 | 31.14665 | 30.87460 |

## For Linear Penalty:

| Benchmark Data | Known Best Solution | | Scheme -5 Largest Degree + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Largest Degree | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 32 | 6.76225 | 4.00195 | 3.93734 |
| CARS91 | 35 | 4.42 | 34 | 7.40466 | 5.20165 | 5.13016 |
| KFU93 | 20 | 12.96 | 20 | 28.73284 | 13.20209 | 12.84389 |
| TRE92 | 23 | 7.75 | 23 | 10.14174 | 6.77155 | 6.68715 |
| YOR83 | 21 | 34.84 | 23 | 40.75664 | 25.55154 | 25.37513 |

| Benchmark Data | Known Best Solution | | Scheme -6 Saturation Degree + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Saturation Degree | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 32 | 6.33172 | 3.87806 | 3.83723 |
| CARS91 | 35 | 4.42 | 34 | 8.20750 | 5.04236 | 5.00584 |
| KFU93 | 20 | 12.96 | 20 | 29.24097 | 12.87979 | 12.32604 |
| TRE92 | 23 | 7.75 | 23 | 9.84036 | 6.59678 | 6.50917 |
| YOR83 | 21 | 34.84 | 22 | 40.442082 | 27.51965 | 27.37300 |

| Benchmark Data | Known Best Solution | | Scheme -6 Random ordering + Kempe + Pairswap | | | |
|---|---|---|---|---|---|---|
| | | | Timeslots | Penalty | | |
| | Timeslots | Penalty | | After Saturation Degree | After Kempe | After Pairswap |
| CARF92 | 32 | 3.74 | 45 | 5.19441 | 2.58352 | 2.49383 |
| CARS91 | 35 | 4.42 | 47 | 6.20277 | 3.27314 | 3.20437 |
| KFU93 | 20 | 12.96 | 26 | 20.71228 | 8.40082 | 7.61936 |
| TRE92 | 23 | 7.75 | 28 | 8.52935 | 5.27293 | 5.14036 |
| YOR83 | 21 | 34.84 | 29 | 30.35706 | 18.63974 | 18.45483 |