CSE 318ARTIFICIAL INTELLIGENCE SESSIONALReport

Offline on Local Search  
(Scheduling Problem)

Date of Submission: 23rd January,2023

Submitted by:Razin Reaz Abedin  
1805074  
Level-3  
Term-2  
CSE-B1

**Tables:**

The schemes were run with **1000 Kempe chain interchanges** and **100000 pair swap attempts**.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 | 10.615 | 5.833 | 5.1306 |
| CARS91 | 35 | 4.42 | 35 | 11.495 | 7.300 | 6.5120 |
| KFU93 | 20 | 12.96 | 20 | 46.516 | 17.604 | 15.5465 |
| TRE92 | 23 | 7.75 | 23 | 15.900 | 10.413 | 9.9202 |
| YOR83 | 21 | 34.84 | 23 | 64.688 | 38.802 | 37.6600 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Benchmark data | Known best solution | | Scheme 2  **Largest Saturation** + Kempe + Pairswap | | | |
| Timeslots | Penalty | | |
| Timeslots | penalty | After Largest Saturation | After Kempe | After pairswap |
| CARF92 | 32 | 3.74 | 31 | 9.801 | 5.922 | 5.2425 |
| CARS91 | 35 | 4.42 | 30 | 12.008 | 8.402 | 7.8395 |
| KFU93 | 20 | 12.96 | 21 | 37.614 | 6.682 | 14.6912 |
| TRE92 | 23 | 7.75 | 21 | 15.897 | 12.382 | 11.8599 |
| YOR83 | 21 | 34.84 | 23 | 65.208 | 36.797 | 35.8544 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 | 10.696 | 5.565 | 4.7864 |
| CARS91 | 35 | 4.42 | 36 | 13.781 | 7.042 | 6.2159 |
| KFU93 | 20 | 12.96 | 21 | 54.512 | 16.918 | 14.9477 |
| TRE92 | 23 | 7.75 | 22 | 16.329 | 11.093 | 10.2849 |
| YOR83 | 21 | 34.84 | 25 | 63.271 | 33.834 | 32.4995 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Benchmark data | Known best solution | | Scheme 4  **Random** + Kempe + Pairswap | | | |
| Timeslots | Penalty | | |
| Timeslots | penalty | After Random | After Kempe | After pairswap |
| CARF92 | 32 | 3.74 | 44 | 8.129 | 3.959 | 3.2175 |
| CARS91 | 35 | 4.42 | 48 | 9.773 | 4.965 | 3.9165 |
| KFU93 | 20 | 12.96 | 25 | 33.317 | 14.476 | 10.9065 |
| TRE92 | 23 | 7.75 | 29 | 13.075 | 7.897 | 7.0117 |
| YOR83 | 21 | 34.84 | 27 | 47.924 | 30.421 | 29.1158 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Benchmark data | Known best solution | | Scheme 5 (LINEAR PENALTY)  **LARGEST SATURATION** + Kempe + Pairswap | | | |
| Timeslots | Penalty | | |
| Timeslots | penalty | After Random | After Kempe | After pairswap |
| CARF92 | 32 | 3.74 | 31 | 6.1830 | 3.8929 | 3.7566 |
| CARS91 | 35 | 4.42 | 30 | 7.7230 | 5.4879 | 5.4040 |
| KFU93 | 20 | 12.96 | 21 | 24.4752 | 12.0871 | 11.5154 |
| TRE92 | 23 | 7.75 | 21 | 10.1317 | 7.6522 | 7.4761 |
| YOR83 | 21 | 34.84 | 23 | 41.9341 | 24.1467 | 23.9511 |