Algoritmo genético para solução do problema de coloração de vértices

Matheus Strutz Soares da Silva

Dados

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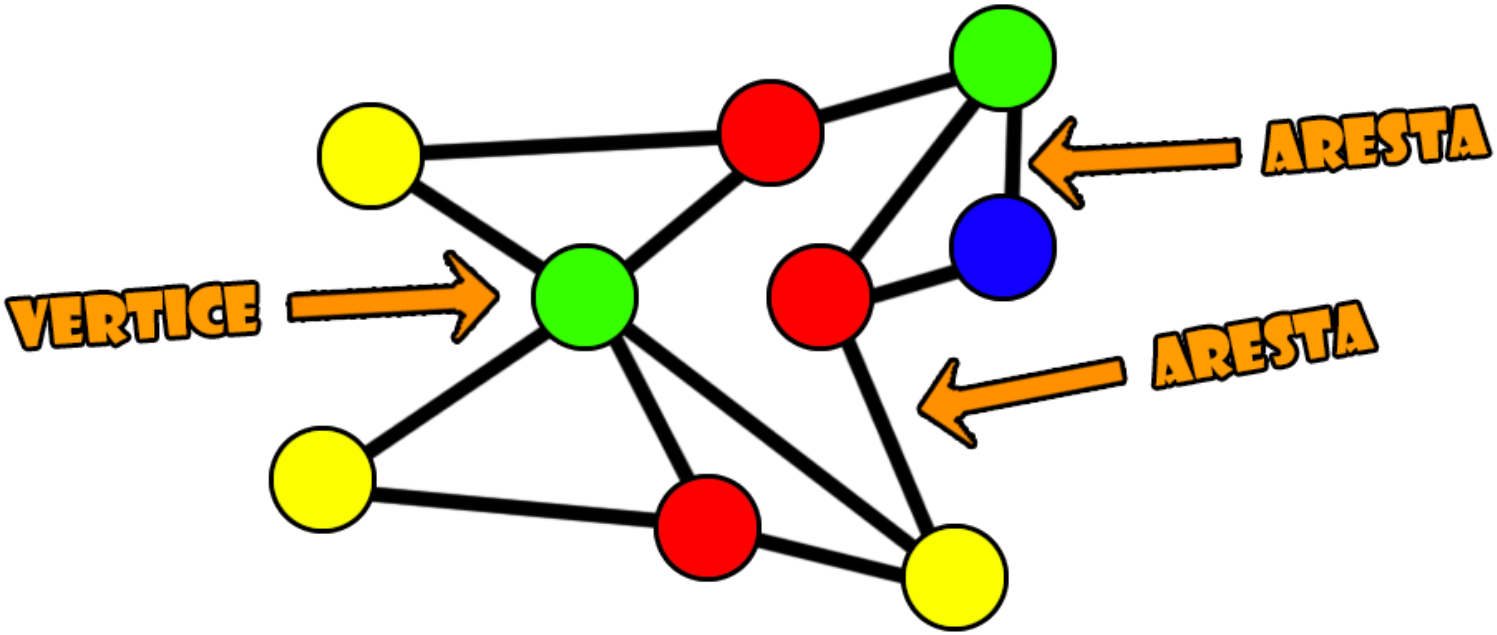
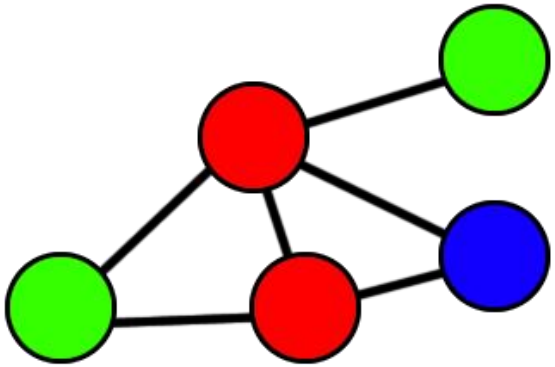
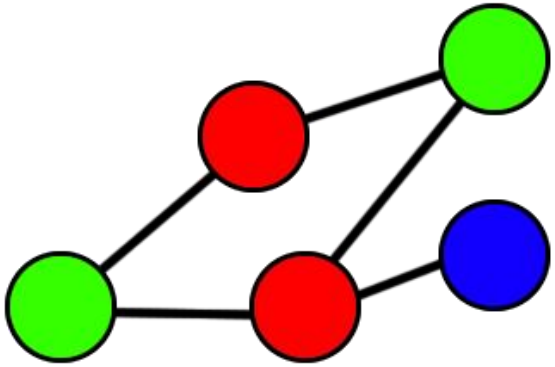
```
c FILE: myciel3.col
c SOURCE: Michael Trick (trick@cmu.edu)
c DESCRIPTION: Graph based on Mycielski transformation.
c              Triangle free (clique number 2) but increasing
c              coloring number
p edge 11 20
e 1 2
e 1 4
e 1 7
e 1 9
e 2 3
e 2 6
e 2 8
e 3 5
e 3 7
e 3 10
e 4 5
e 4 6
e 4 10
e 5 8
e 5 9
e 6 11
e 7 11
e 8 11
e 9 11
e 10 11
```



9 Vértices e 13 Arestas

Problema





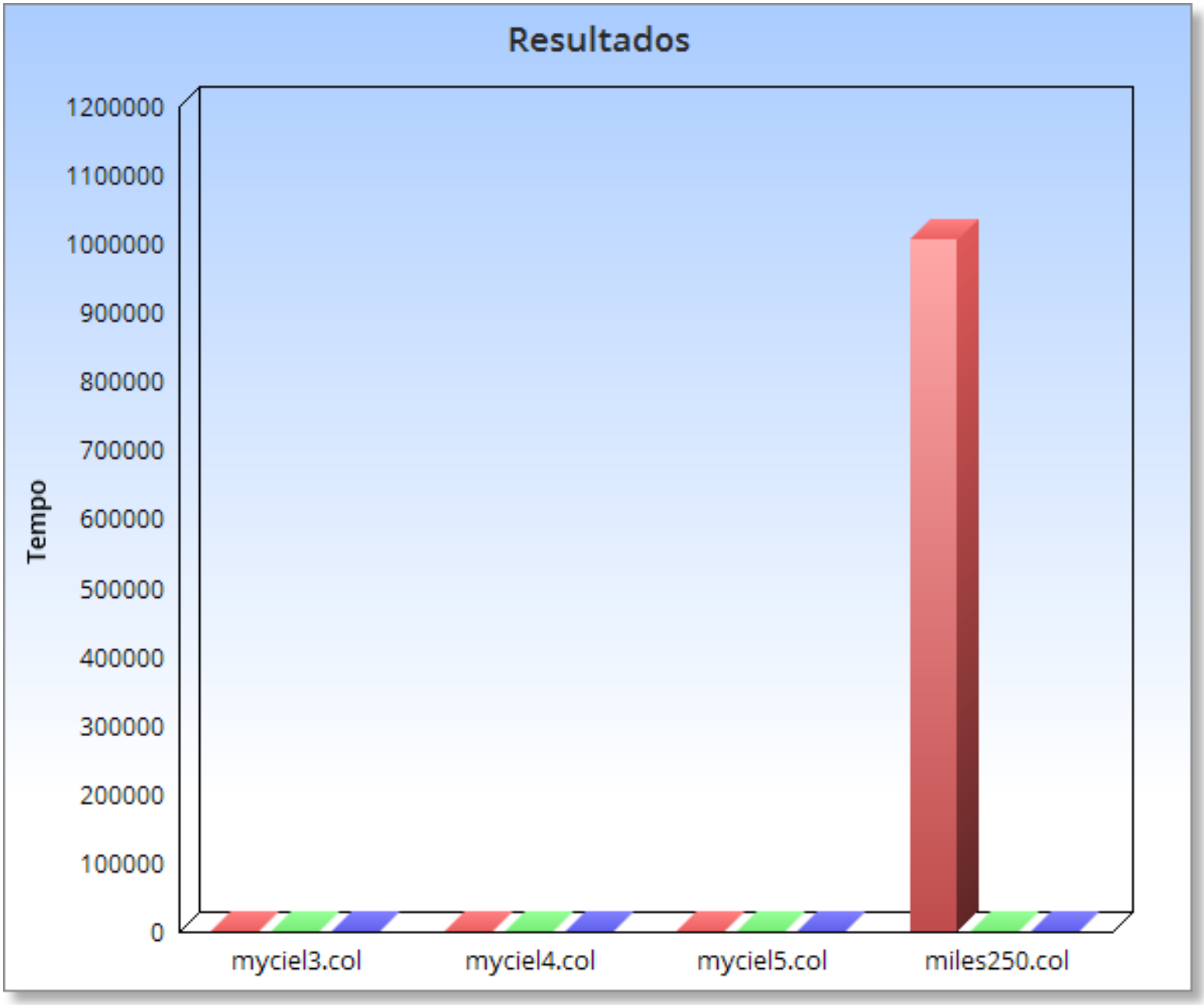
Cromossomo

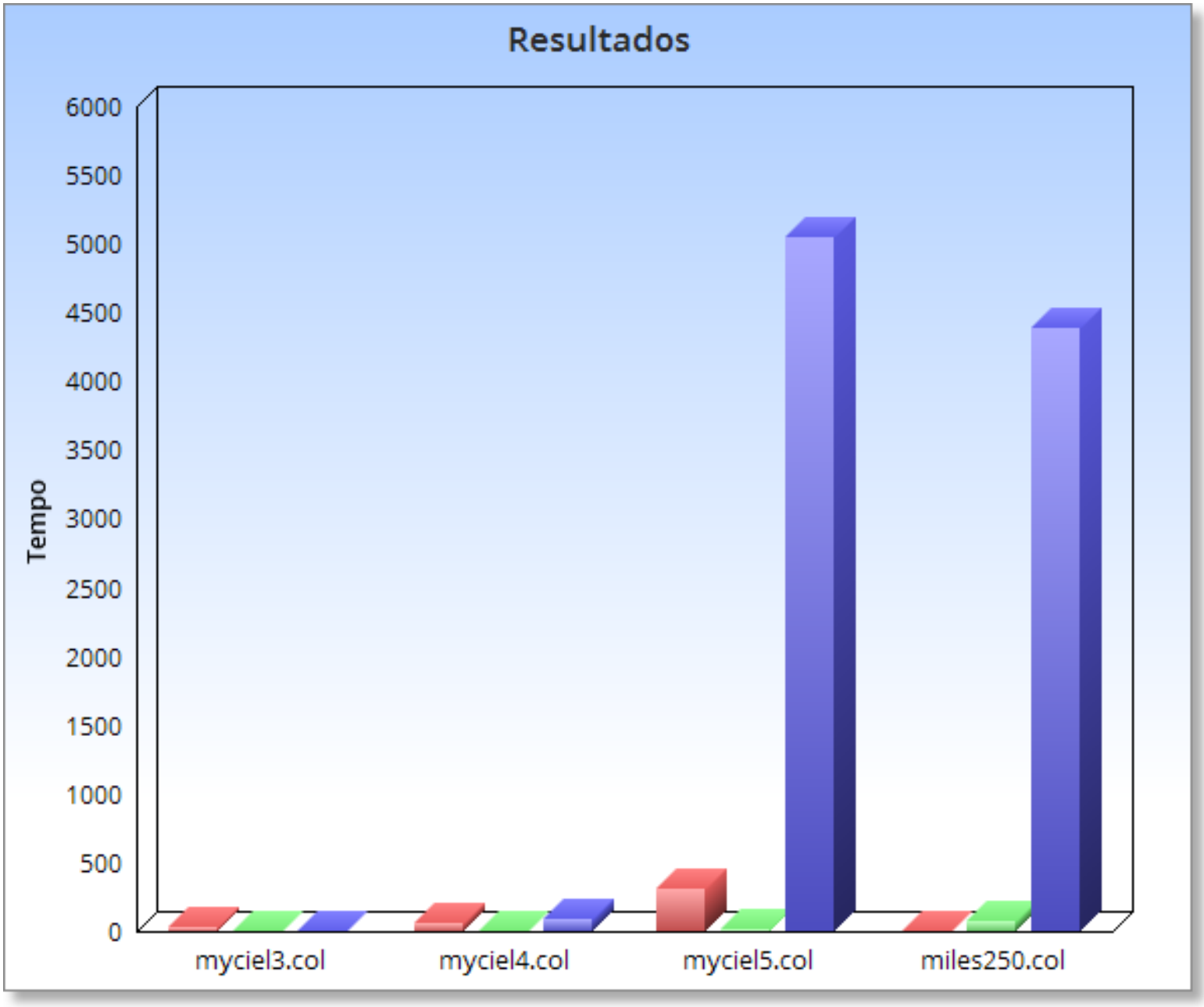
- Genes = Numero de arestas
- Fitness = Numero de colisões
- Posição na população

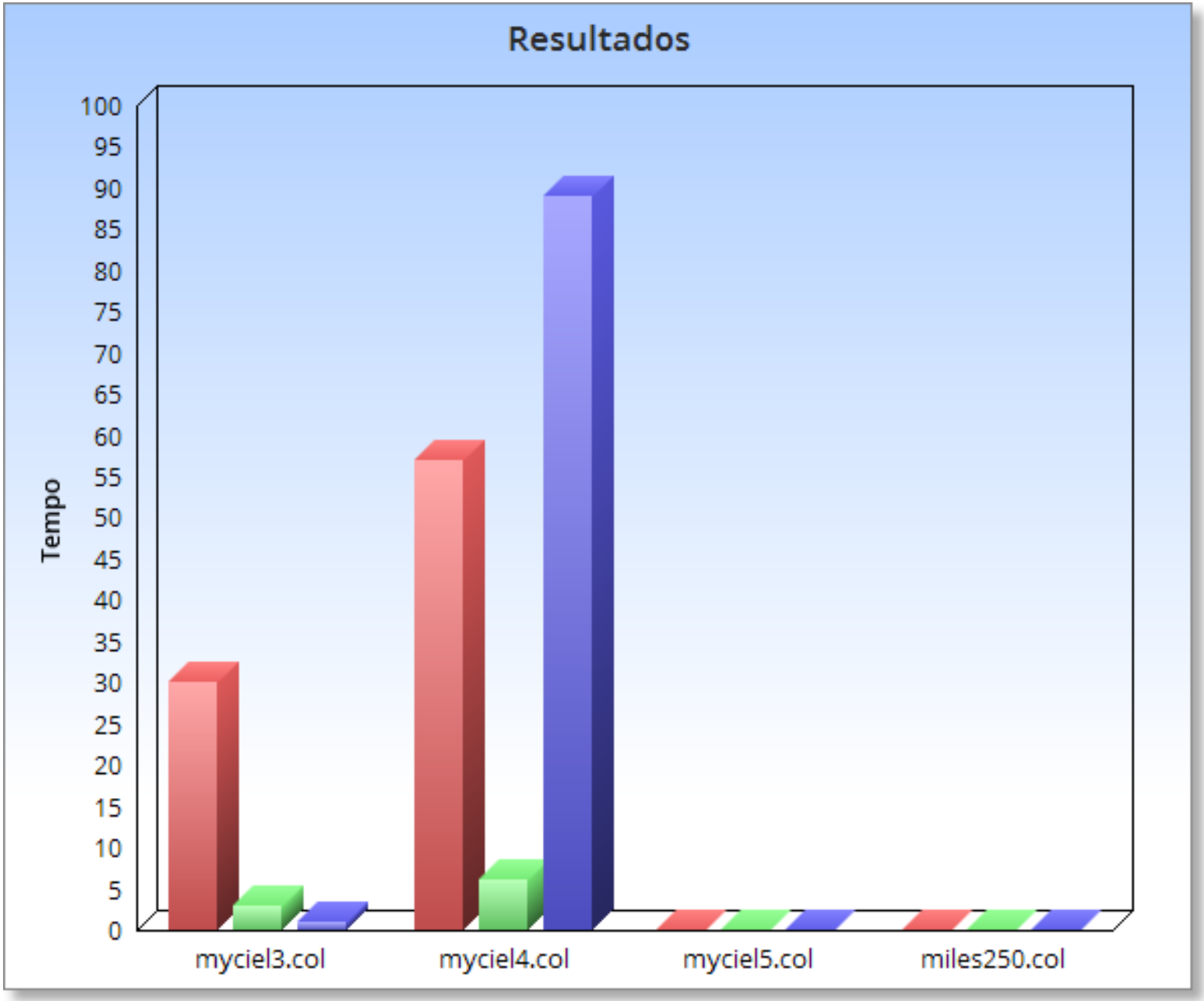
- População = Gerado automaticamente
- Seleção = Torneio (1 por pai)
- Cruzamento = Mascara
- Mutação = Cor aleatória, não repetida, e um vértice com colisão
- Inserção = Pior pai

Resultados

- Matheus Strutz = Cor Vermelha
- Musa M. Hindi and Roman V. Yampolskiy = Cor Verde
- Sidi Mohamed Douir = Cor Azul


Resultados
Tempo
1200000
1100000
1000000
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
myciel3.col
myciel4.col
myciel5.col
miles250.col


Resultados
Tempo
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
myciel3.col
myciel4.col
myciel5.col
miles250.col


Resultados
Tempo
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
myciel3.col
myciel4.col
myciel5.col
miles250.col

X Data	Y Data	Y Data	Y Data
myciel3.col	0,030	0,003	0,001
myciel4.col	0,057	0,006	0,089
myciel5.col	0,308	0.014	5.410
miles250.col	1007,103	0.076	4.390

- miles1000.col – 06:27h
- jean.col – 00:29h
- huck.col – 00:49h
- homer.col – 2:01h
- games120.col – 00:21h
- fpsol2.i.1.col – 16:25h
- david.col – 1:17h
- anna.col – 4:09h

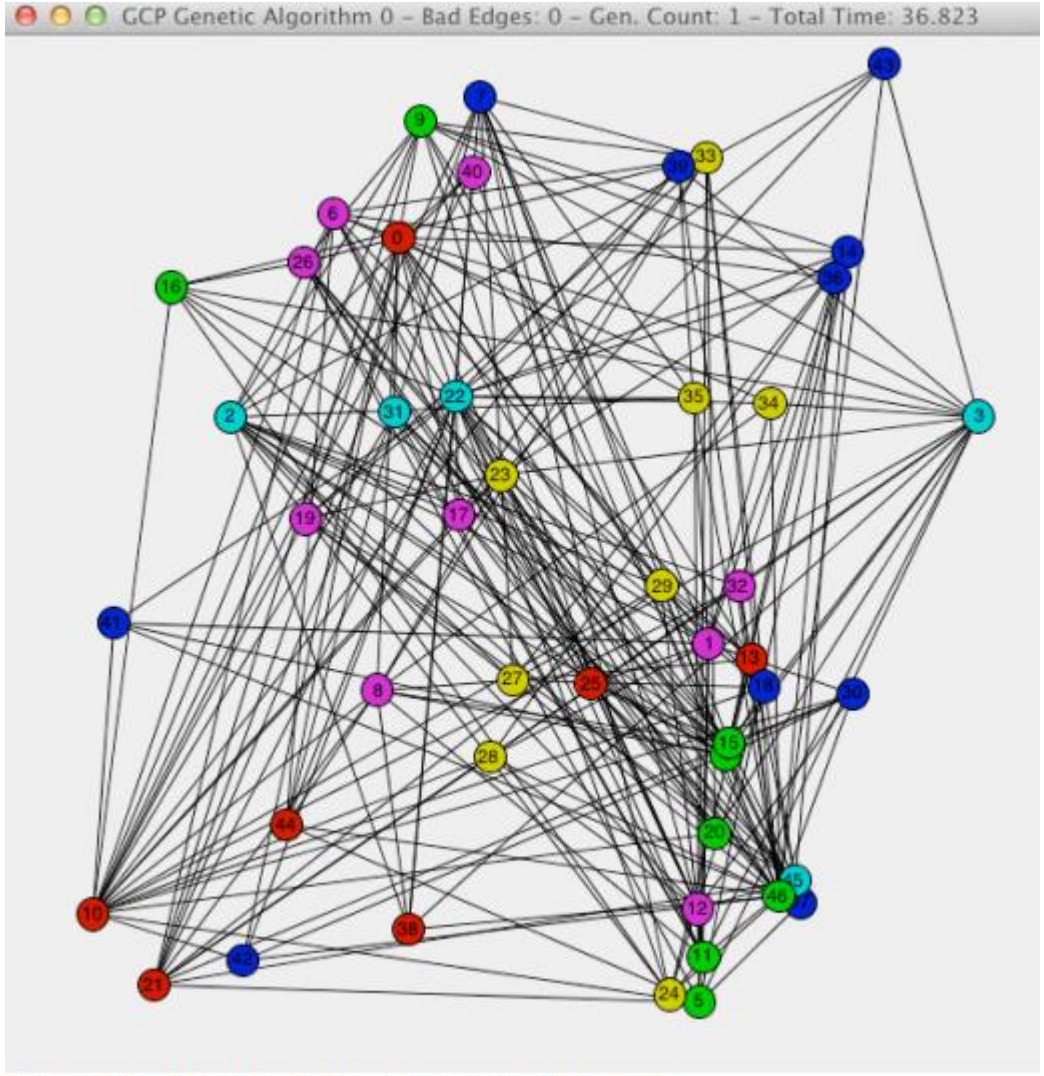


Figure 5: GCP solution for myciel5.col

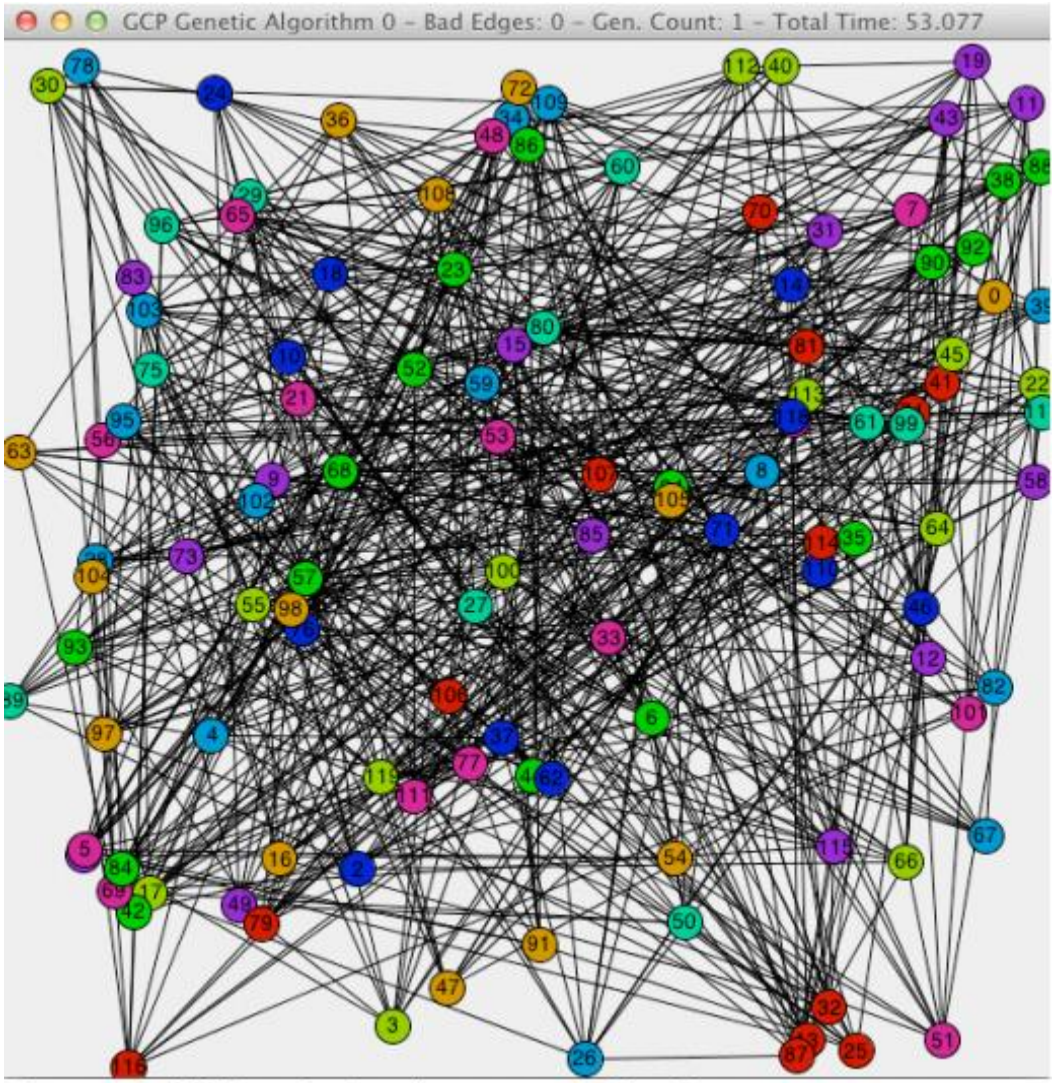


Figure 6: GCP solution for games120.col

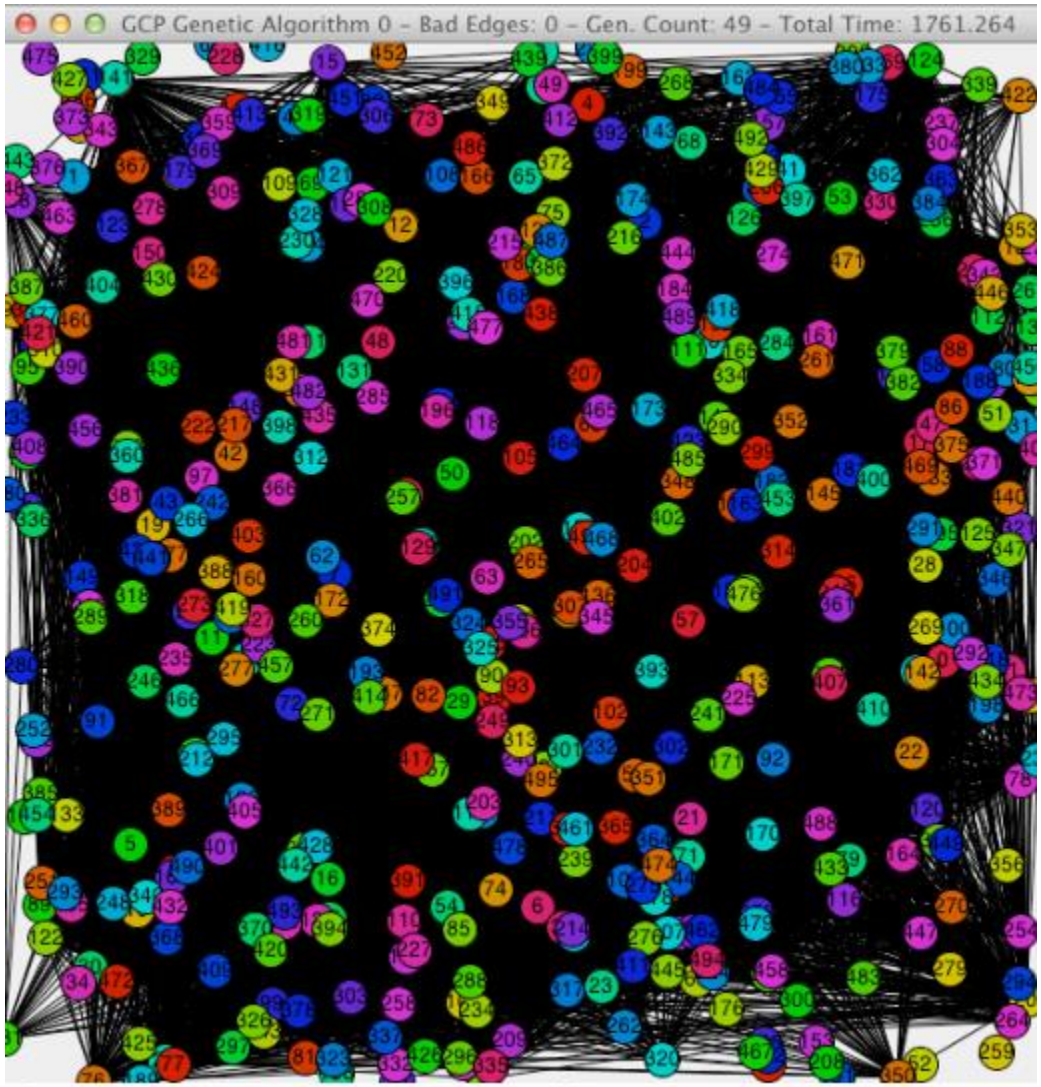


Figure 7: GCP solution for fpsol2.i.col