Raport 1 (Motroi Valeriu)

Problema: Maximal Independent Set

Solutia: Folosesc modelul ILP de mai jos, implementat in GUROBI.

$$\max \sum Selected[i]$$

$$subject\ to: Selected[i] \in \{0, 1\}$$

$$Selected[u] + Selected[v] \leq 1, \forall\ (u, v) \in E(G)$$

Cod:

```
selected = model.addVars(range(max(u + v) + 1), vtype = GRB.BINARY, name = "selected")

model.addConstrs((selected[u[i]] + selected[v[i]] <= 1 for i in range(len(u))), name = 'independence')

model.addConstrs((selected[i] <= 1 for i in range(max(u + v))), name = 'limit1')

model.setObjective(sum(selected[i] for i in range(max(u + v) + 1)), GRB.MAXIMIZE)

model.optimize()
```

Set de Date:

- Small Star Graph, 7 Nodes and 6 Edges
- Email-Eu-Core, 1004 Nodes, 25571 Edges
- Facebook-Combined 4038 Nodes, 88234 Edges
- P2p-Gnutella08 6300 Nodes, 20777 Edges

Rezultate:

Setul de date	Max Indep Set gasit	Timp de rulare (sec)	Iteratii simplex
Small Star Graph	6	0.01	0
Email-Eu-Core	280	0.05	0
Facebook-Combined	1046	102.03 stopped	111031
P2p-Gnutella	4247	0.14	2