

Results for instances from collection
TeamFormation-QKP-2

File Synthetic_TF_01000.txt

| Property of graph | Value |
|----------------------|--------|
| Nodes (n) | 1,000 |
| Density (Δ) | 13.4 % |
| Edges (m) | 67,159 |

| | | Deviation from best OFV (%) | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------|------|----|-------------|-------------|------------------|------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 31.9 | 0.00 | 32.21 | — | — | 0.00 | 0.00 | 0.00 | 2.7 | 120.0 | 120.0 | 6.8 | 120.0 |
| 5.0 | 57.6 | 0.00 | 36.14 | — | — | 0.00 | 0.00 | 0.00 | 5.9 | 120.0 | 120.0 | 11.4 | 120.0 |
| 10.0 | 104.5 | 0.05 | 23.69 | — | — | 0.00 | 3.18 | 0.01 | 11.2 | 120.0 | 120.0 | 11.7 | 120.0 |
| 25.0 | 229.6 | 0.07 | 10.29 | — | — | 0.00 | 1.23 | 0.01 | 25.8 | 120.0 | 120.0 | 39.8 | 120.0 |
| 50.0 | 418.1 | 0.02 | 1.91 | — | — | 0.00 | 0.09 | 0.01 | 42.6 | 120.0 | 120.0 | 39.3 | 120.0 |
| 75.0 | 573.0 | 0.00 | 1.02 | — | — | 0.00 | 0.04 | 0.01 | 54.4 | 120.0 | 120.0 | 15.7 | 120.0 |
| 90.0 | 629.4 | 0.00 | 0.09 | — | — | 0.00 | 0.00 | 0.01 | 61.2 | 120.0 | 120.0 | 11.5 | 70.0 |
| 95.0 | 640.0 | 0.00 | 0.04 | 5.61 | — | 0.01 | 0.00 | 0.01 | 61.7 | 105.2 | 120.0 | 8.6 | 28.0 |
| Avg | | 0.02 | 13.17 | — | — | 0.00 | 0.57 | 0.01 | 33.2 | 118.2 | 120.0 | 18.1 | 102.2 |
| Min | | 0.00 | 0.04 | 5.61 | — | 0.00 | 0.00 | 0.00 | 2.7 | 105.2 | 120.0 | 6.8 | 28.0 |
| Max | | 0.07 | 36.14 | — | — | 0.01 | 3.18 | 0.01 | 61.7 | 120.0 | 120.0 | 39.8 | 120.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 162 |
| Running time in seconds for writing input file (t^{write}) | 3.3 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 0.4 |
| Running time in seconds for reading result file (t^{read}) | 0.0 |

File Synthetic_TF_02000.txt

| Property of graph | Value |
|----------------------|---------|
| Nodes (n) | 2,000 |
| Density (Δ) | 12.4 % |
| Edges (m) | 247,696 |

| | | Deviation from best OFV (%) | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------|----|----|-------------|-------------|------------------|-------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 116.5 | 0.50 | 33.47 | — | — | 0.00 | 10.31 | 0.03 | 14.5 | 120.0 | 120.0 | 85.6 | 120.0 |
| 5.0 | 208.6 | 0.02 | 20.98 | — | — | 0.00 | 10.43 | 0.03 | 31.9 | 120.0 | 120.0 | 115.9 | 120.0 |
| 10.0 | 372.3 | 0.00 | 14.13 | — | — | 46.86 | 4.36 | 0.04 | 72.8 | 120.0 | 120.0 | 120.3 | 120.0 |
| 25.0 | 839.3 | 0.00 | 4.37 | — | — | 67.89 | 0.64 | 0.07 | 120.0 | 120.0 | 120.0 | 120.6 | 120.0 |
| 50.0 | 1,598.5 | 0.00 | 1.88 | — | — | 40.12 | 0.21 | 0.05 | 120.0 | 120.0 | 120.0 | 120.7 | 120.0 |
| 75.0 | 2,236.5 | 0.00 | 0.19 | — | — | 0.01 | 0.06 | 0.06 | 120.2 | 120.0 | 120.0 | 81.7 | 120.0 |
| 90.0 | 2,486.5 | 0.00 | 0.02 | — | — | 0.00 | 0.01 | 0.07 | 120.0 | 120.0 | 120.0 | 66.0 | 120.0 |
| 95.0 | 2,537.4 | 0.00 | 0.01 | — | — | 0.00 | 0.00 | 0.07 | 120.0 | 120.0 | 120.0 | 57.8 | 120.0 |
| Avg | | 0.07 | 9.38 | — | — | 19.36 | 3.25 | 0.05 | 89.9 | 120.0 | 120.0 | 96.1 | 120.0 |
| Min | | 0.00 | 0.01 | — | — | 0.00 | 0.00 | 0.03 | 14.5 | 120.0 | 120.0 | 57.8 | 120.0 |
| Max | | 0.50 | 33.47 | — | — | 67.89 | 10.43 | 0.07 | 120.2 | 120.0 | 120.0 | 120.7 | 120.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 134 |
| Running time in seconds for writing input file (t^{write}) | 7.8 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 1.0 |
| Running time in seconds for reading result file (t^{read}) | 0.0 |

File Synthetic_TF_04000.txt

| Property of graph | Value |
|----------------------|-----------|
| Nodes (n) | 4,000 |
| Density (Δ) | 12.7 % |
| Edges (m) | 1,014,045 |

| | | Deviation from best OFV (%) | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------------|----|----|----------|--------|------------------|-------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 391.4 | 0.00 | 46.76 | — | — | 2,355.68 | 11.13 | 0.09 | 120.0 | 120.0 | 120.0 | 120.5 | 122.0 |
| 5.0 | 709.4 | 0.00 | 29.59 | — | — | 643.54 | 6.56 | 0.13 | 120.0 | 120.0 | 120.0 | 120.5 | 122.0 |
| 10.0 | 1,291.4 | 0.00 | 11.24 | — | — | 263.88 | 4.22 | 0.38 | 120.1 | 120.0 | 120.0 | 120.5 | 122.0 |
| 25.0 | 3,149.7 | 0.00 | 2.15 | — | — | 118.24 | 2.31 | 0.33 | 120.1 | 120.0 | 120.0 | 120.5 | 122.0 |
| 50.0 | 6,177.8 | 0.00 | 0.50 | — | — | 49.30 | 1.60 | 0.26 | 120.5 | 120.0 | 120.0 | 120.5 | 122.0 |
| 75.0 | 8,717.6 | 0.00 | 0.11 | — | — | 17.27 | 0.60 | 0.28 | 120.1 | 120.0 | 120.0 | 120.9 | 122.0 |
| 90.0 | 9,775.0 | 0.00 | 0.00 | — | — | 6.94 | 0.15 | 0.32 | 120.4 | 120.0 | 120.0 | 120.5 | 122.0 |
| 95.0 | 10,009.0 | 0.00 | 0.00 | — | — | 2.87 | 0.04 | 0.34 | 120.4 | 120.0 | 120.0 | 120.5 | 122.0 |
| Avg | | 0.00 | 11.29 | — | — | 432.21 | 3.33 | 0.27 | 120.2 | 120.0 | 120.0 | 120.6 | 122.0 |
| Min | | 0.00 | 0.00 | — | — | 2.87 | 0.04 | 0.09 | 120.0 | 120.0 | 120.0 | 120.5 | 122.0 |
| Max | | 0.00 | 46.76 | — | — | 2,355.68 | 11.13 | 0.38 | 120.5 | 120.0 | 120.0 | 120.9 | 122.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 161 |
| Running time in seconds for writing input file (t^{write}) | 19.5 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 2.7 |
| Running time in seconds for reading result file (t^{read}) | 0.0 |

File Synthetic_TF_06000.txt

| Property of graph | Value |
|----------------------|-----------|
| Nodes (n) | 6,000 |
| Density (Δ) | 12.5 % |
| Edges (m) | 2,257,990 |

| | | Deviation from best OFV (%) | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------------|----|----|--------|--------|------------------|-------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 655.8 | 0.00 | 28.88 | — | — | 721.50 | 19.13 | 0.22 | 120.1 | 120.0 | 120.0 | 120.5 | 120.0 |
| 5.0 | 1,284.3 | 0.00 | 13.75 | — | — | 475.95 | 6.77 | 0.22 | 120.0 | 120.0 | 120.0 | 121.2 | 120.0 |
| 10.0 | 2,666.5 | 0.00 | 6.91 | — | — | 255.96 | 7.67 | 0.45 | 120.2 | 120.0 | 120.0 | 121.0 | 120.0 |
| 25.0 | 6,883.5 | 0.00 | 1.57 | — | — | 99.76 | 4.44 | 0.71 | 120.8 | 120.0 | 120.0 | 121.5 | 120.0 |
| 50.0 | 13,690.9 | 0.00 | 0.52 | — | — | 42.19 | 3.26 | 0.55 | 121.1 | 120.0 | 120.0 | 122.4 | 120.0 |
| 75.0 | 19,597.2 | 0.00 | 0.01 | — | — | 17.78 | 1.65 | 0.64 | 120.2 | 120.0 | 120.0 | 121.3 | 120.0 |
| 90.0 | 22,107.8 | 0.00 | 0.00 | — | — | 6.56 | 0.46 | 0.70 | 120.9 | 120.0 | 120.0 | 121.2 | 120.0 |
| 95.0 | 22,652.0 | 0.00 | 0.00 | — | — | 2.59 | 0.15 | 0.73 | 121.6 | 120.0 | 120.0 | 121.3 | 120.0 |
| Avg | | 0.00 | 6.46 | — | — | 202.79 | 5.44 | 0.53 | 120.6 | 120.0 | 120.0 | 121.3 | 120.0 |
| Min | | 0.00 | 0.00 | — | — | 2.59 | 0.15 | 0.22 | 120.0 | 120.0 | 120.0 | 120.5 | 120.0 |
| Max | | 0.00 | 28.88 | — | — | 721.50 | 19.13 | 0.73 | 121.6 | 120.0 | 120.0 | 122.4 | 120.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 168 |
| Running time in seconds for writing input file (t^{write}) | 35.9 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 4.9 |
| Running time in seconds for reading result file (t^{read}) | 0.0 |

File Synthetic_TF_08000.txt

| Property of graph | Value |
|----------------------|-----------|
| Nodes (n) | 8,000 |
| Density (Δ) | 12.6 % |
| Edges (m) | 4,023,218 |

| | | Deviation from best OFV (%) | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------------|----|----|--------|--------|------------------|-------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 1,228.3 | 0.00 | 33.13 | — | — | — | 16.77 | 0.34 | 120.0 | 120.0 | 120.0 | 120.6 | 120.0 |
| 5.0 | 2,327.9 | 0.00 | 21.44 | — | — | — | 13.86 | 0.37 | 120.3 | 120.0 | 120.0 | 120.7 | 120.0 |
| 10.0 | 4,702.1 | 0.00 | 7.76 | — | — | — | 8.91 | 1.02 | 120.2 | 120.0 | 120.0 | 120.6 | 120.0 |
| 25.0 | 12,082.6 | 0.00 | 1.78 | — | — | — | 7.36 | 1.39 | 121.0 | 120.0 | 120.0 | 120.6 | 120.0 |
| 50.0 | 24,279.4 | 0.00 | 0.26 | — | — | — | 5.89 | 1.03 | 120.3 | 120.0 | 120.0 | 120.6 | 120.0 |
| 75.0 | 34,905.3 | 0.00 | 0.04 | — | — | — | 3.57 | 1.22 | 122.7 | 120.0 | 120.0 | 120.6 | 120.0 |
| 90.0 | 39,378.8 | 0.00 | 0.00 | — | — | — | 1.23 | 1.34 | 120.1 | 120.0 | 120.0 | 120.6 | 120.0 |
| 95.0 | 40,344.0 | 0.00 | 0.00 | — | — | — | 0.47 | 1.38 | 121.4 | 120.0 | 120.0 | 120.6 | 120.0 |
| Avg | | 0.00 | 8.05 | — | — | — | 7.26 | 1.01 | 120.8 | 120.0 | 120.0 | 120.6 | 120.0 |
| Min | | 0.00 | 0.00 | — | — | — | 0.47 | 0.34 | 120.0 | 120.0 | 120.0 | 120.6 | 120.0 |
| Max | | 0.00 | 33.13 | — | — | — | 16.77 | 1.39 | 122.7 | 120.0 | 120.0 | 120.7 | 120.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 187 |
| Running time in seconds for writing input file (t^{write}) | 55.9 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 8.0 |
| Running time in seconds for reading result file (t^{read}) | 0.1 |

File Synthetic_TF_10000.txt

| Property of graph | Value |
|----------------------|-----------|
| Nodes (n) | 10,000 |
| Density (Δ) | 12.8 % |
| Edges (m) | 6,383,021 |

| | | Deviation from best OFV (%) | | | | | | | Running time (s) | | | | | |
|----------|----------|-----------------------------|-------------|----|----|--------|--------|--|------------------|-------|-------|-------|--------|--------|
| γ | Best OFV | QKBP* | RG | DP | QK | Gurobi | Hexaly | | QKBP* | RG | DP | QK | Gurobi | Hexaly |
| 2.5 | 1,827.9 | 0.00 | 33.38 | — | — | — | 35.15 | | 0.64 | 120.2 | 120.0 | 120.0 | 121.0 | 120.0 |
| 5.0 | 3,518.4 | 0.00 | 18.66 | — | — | — | 24.98 | | 0.65 | 120.3 | 120.0 | 120.0 | 121.1 | 120.0 |
| 10.0 | 7,107.6 | 0.00 | 6.87 | — | — | — | 16.73 | | 1.63 | 121.0 | 120.0 | 120.0 | 121.1 | 120.0 |
| 25.0 | 18,590.7 | 0.00 | 1.20 | — | — | — | 13.95 | | 2.35 | 121.4 | 120.0 | 120.0 | 121.1 | 120.0 |
| 50.0 | 37,622.0 | 0.00 | 0.27 | — | — | — | 12.05 | | 1.51 | 123.5 | 120.0 | 120.0 | 121.0 | 120.0 |
| 75.0 | 54,050.2 | 0.00 | 0.03 | — | — | — | 6.63 | | 2.00 | 121.9 | 120.0 | 120.0 | 121.0 | 120.0 |
| 90.0 | 61,092.6 | 0.00 | 0.00 | — | — | — | 2.34 | | 2.20 | 123.2 | 120.0 | 120.0 | 121.0 | 120.0 |
| 95.0 | 62,630.4 | 0.00 | 0.00 | — | — | — | 0.96 | | 2.33 | 125.0 | 120.0 | 120.0 | 121.0 | 120.0 |
| Avg | | 0.00 | 7.55 | — | — | — | 14.10 | | 1.66 | 122.1 | 120.0 | 120.0 | 121.1 | 120.0 |
| Min | | 0.00 | 0.00 | — | — | — | 0.96 | | 0.64 | 120.2 | 120.0 | 120.0 | 121.0 | 120.0 |
| Max | | 0.00 | 33.38 | — | — | — | 35.15 | | 2.35 | 125.0 | 120.0 | 120.0 | 121.1 | 120.0 |

*The contribution in this paper

| QKBP-specific information | Value |
|---|-------|
| Number of breakpoints | 174 |
| Running time in seconds for writing input file (t^{write}) | 81.6 |
| Running time in seconds for executing parametric cut procedure (t^{cut}) | 11.9 |
| Running time in seconds for reading result file (t^{read}) | 0.1 |