Yumbo. Scheduling, Planning and Resource Allocation

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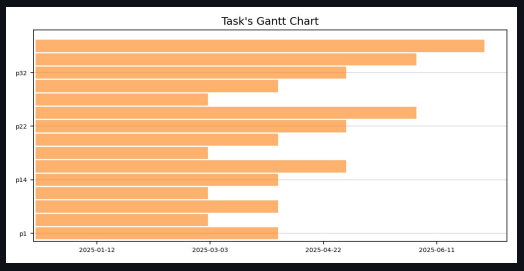
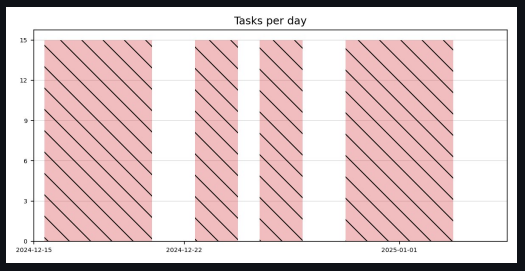
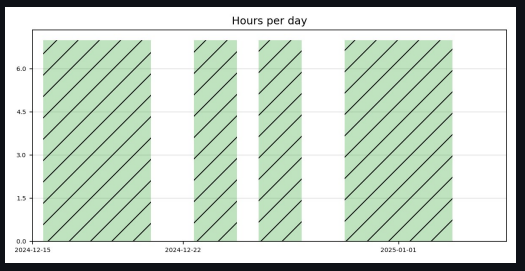
Source code, documentation and sample Excel input files can be found on Yumbo's GitHub repository.

29 January 2025, 18:52:30 PM

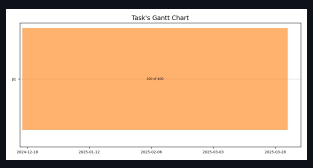
Experts overview

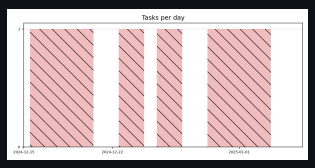


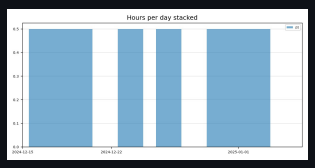


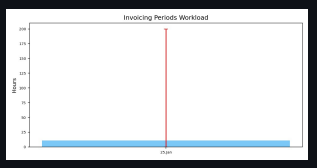


Alojzy 1 task per day

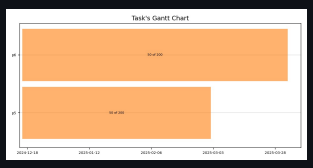


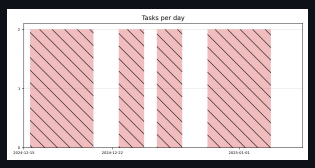


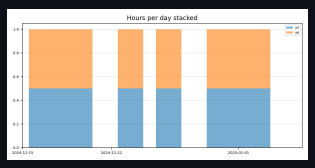


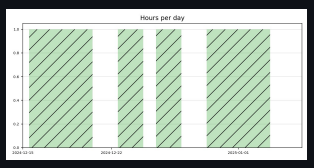


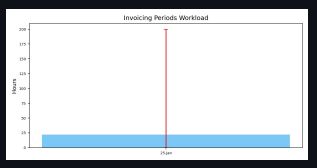
Eugeniusz 2 tasks per day



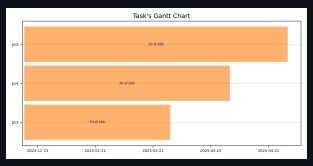


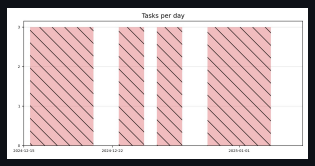


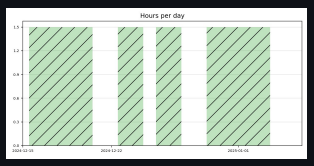


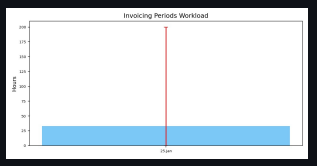


Ignacy 3 tasks per day

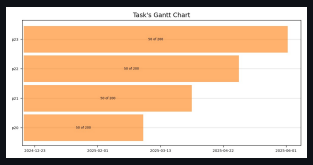


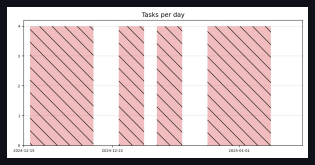


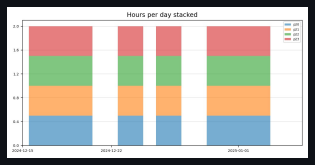


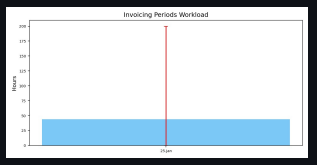


Pafnucy 4 tasks per day

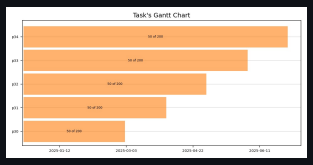


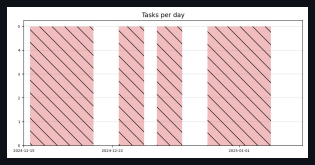


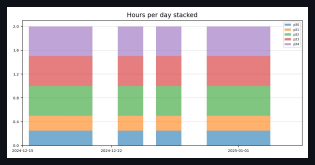


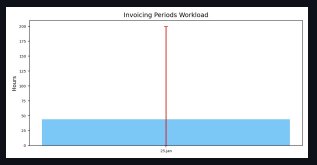


Romuald 5 tasks per day









Solver output at 29 January 2025, 18:52:31 PM

```
max_context = 2
tva cells:    0 at level 0
              26 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 0, o = 26
0 variables, 0 constraints, 0 objectives
max_context = 3
tva cells:    0 at level 0
              42 at levels above 0
tva_hcl = 8, tva_len = 256
rewrites: m = 20, o = 41
29925 variables, 41490 constraints, 1 objectives
84569 nonzeros

Presolve eliminates 29032 constraints and 17740 variables.
"option presolve 10;" used, but "option presolve 2;" would suffice.
Adjusted problem:
12185 variables:
       6055 binary variables
```

```
       6055 integer variables
       75 linear variables
12458 constraints, all linear; 32018 nonzeros
       15 equality constraints
       12443 inequality constraints
1 linear objective; 75 nonzeros.

presolve results:
       variables omitted:   17740
       constraints omitted: 29032
       ranges relaxed:            12368
       bounds improved:     18131
       nba cycles:          1
       bound row scans:     12458
       row-scan updates:    15
SCIP 9.0.1:   tech:outlev-native = 5
LP Solver <Soplex 7.0.1>: barrier convergence tolerance cannot be set -- tolerance of SCIP and LP solver may differ
LP Solver <Soplex 7.0.1>: fastmip setting not available -- SCIP parameter has no effect
LP Solver <Soplex 7.0.1>: number of threads settings not available -- SCIP parameter has no effect
transformed problem has 12185 variables (6055 bin, 6055 int, 0 impl, 75 cont) and 12458 constraints
  12458 constraints of type <linear>

original problem has 32018 active (0.0210921%) nonzeros and 32018 (0.0210921%) check nonzeros

presolving:
(round 1, fast)       5195 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 0 upgd conss, 0 impls, 0 clqs
(round 2, fast)       10315 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 0 upgd conss, 0 impls, 0 clqs
(round 3, exhaustive) 10315 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 1032 upgd conss, 0 impls, 0 clqs
(round 4, exhaustive) 10315 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 1967 upgd conss, 993 impls, 0 clqs
   (0.1s) probing: 51/935 (5.5%) - 0 fixings, 0 aggregations, 0 implications, 0 bound changes
   (0.1s) probing aborted: 50/50 successive totally useless probings
   (0.1s) symmetry computation started: requiring (bin +, int +, cont +), (fixed: bin -, int -, cont -)
   (0.1s) no symmetry present (symcode time: 0.00)
cons components found 5 undirected components at node 1, depth 0 (0)
clique table cleanup detected 0 bound changes

presolved problem has 3767 active (0.20428%) nonzeros and 3767 (0.20428%) check nonzeros

presolving (5 rounds: 5 fast, 3 medium, 3 exhaustive):
 10915 deleted vars, 11006 deleted constraints, 0 added constraints, 15 tightened bounds, 0 added holes, 0 changed sides, 0 changed coefficients
 2054 implications, 0 cliques
presolved problem has 1270 variables (635 bin, 635 int, 0 impl, 0 cont) and 1452 constraints
   1313 constraints of type <varbound>
    139 constraints of type <linear>
Presolving Time: 0.08

 time | node  | left  |LP iter|LP it/n|mem/heur|mdpt |vars |cons |rows |cuts |sepa|confs|strbr|  dualbound   | primalbound  |  gap   | compl.
p 0.1s|     1 |     0 |     0 |     - | vbounds|   0 |1270 |1452 |1452 |   0 |  0 |   0 |   0 | 2.386024e+04 | 5.132988e+04 | 115.13%| unknown
p 0.1s|     1 |     0 |     0 |     - | vbounds|   0 |1270 |1452 |1452 |   0 |  0 |   0 |   0 | 2.386024e+04 | 4.958007e+04 | 107.79%| unknown
  0.1s|     1 |     0 |   564 |     - |    54M |   0 |1270 |1452 |1452 |   0 |  0 |   0 |   0 | 4.958007e+04 | 4.958007e+04 |   0.00%| unknown

SCIP Status        : problem is solved [optimal solution found]
Solving Time (sec) : 0.13
Solving Nodes      : 1
Primal Bound       : +4.95800673636744e+04 (2 solutions)
Dual Bound         : +4.95800673636744e+04
Gap                : 0.00 %
WARNING: No dual information available when presolving was performed.
max_context = 3
tva cells:    0 at level 0
              25 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 20, o = 41
max_context = 3
tva cells:    0 at level 0
              25 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 20, o = 41
SCIP 9.0.1: optimal solution; objective 49580.06736
564 simplex iterations
1 branching nodes
max_context = 3
tva cells:    0 at level 0
              25 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 20, o = 41
max_context = 3
tva cells:    0 at level 0
              25 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 20, o = 41
max_context = 3
tva cells:    0 at level 0
              25 at levels above 0
tva_hcl = 7, tva_len = 128
rewrites: m = 20, o = 41
```

Statistics on chart creation

Chart title	Chart short name	Number of calls	Total time [s]	Average time [s]	Total nbytes	Average nbytes
Hours per day stacked	simg	5	0.932	0.186	23640	4728
Hours per day	himg	5	0.800	0.160	34874	6975
Tasks per day	timg	5	0.777	0.155	28916	5783
Task's Gantt Chart	gimg	5	0.670	0.134	20368	4074
Invoicing Periods Workload	wimg	5	0.604	0.121	22242	4448
Tasks per day (Summary)	timgsum	1	0.171	0.171	6922	6922
Hours per day (Summary)	himgsum	1	0.167	0.167	7014	7014
Task's Gantt Chart (Summary)	gimgsum	1	0.157	0.157	3286	3286
Plot task with its constrains	bimg	0	0.000	0.000	0	0

Statistics on AMPL solution

Total elapsed time: 0.351 [s]