

# Yumbo. Scheduling, Planning and Resource Allocation

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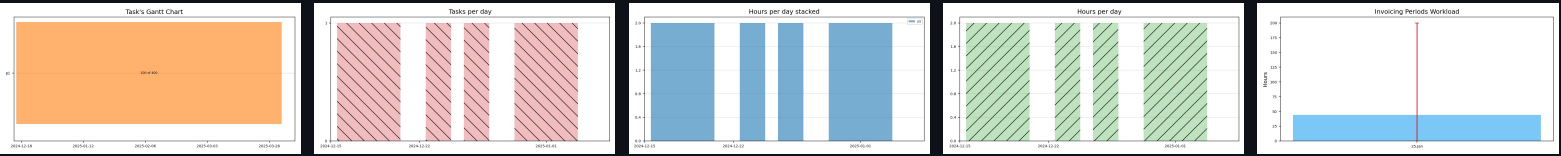
Source code, documentation and sample Excel input files can be found on [Yumbo's](#) GitHub repository.

29 January 2025, 18:57:29 PM

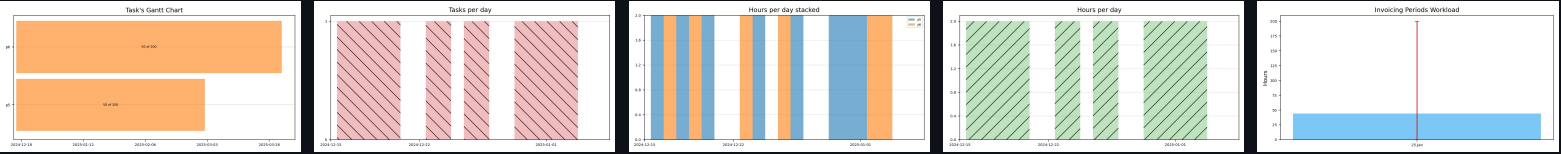
## Experts overview



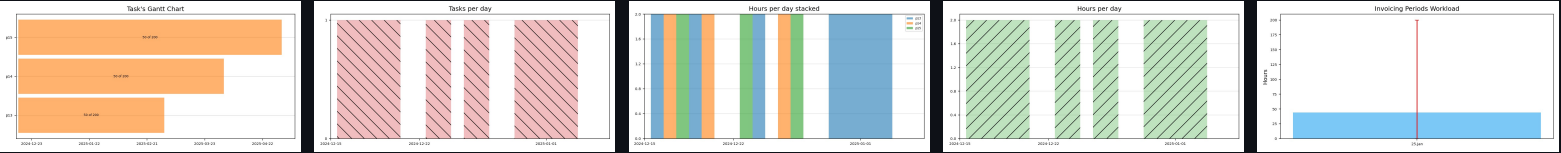
## Aloyzy 1 task per day



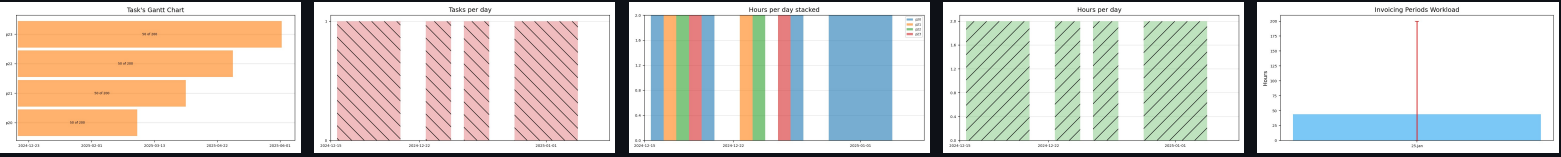
## Eugeniusz 2 tasks per day



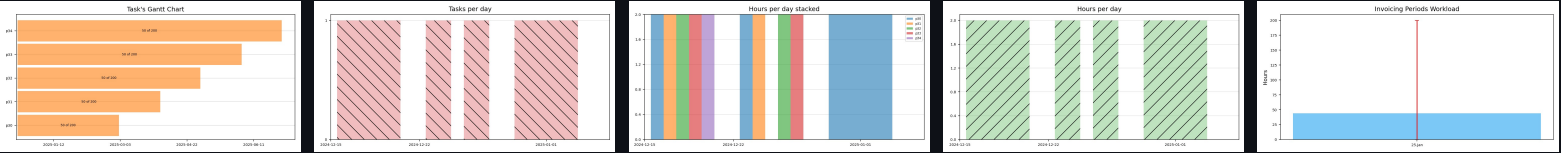
## Ignacy 3 tasks per day



## Pafnucy 4 tasks per day



## Romuald 5 tasks per day



## Solver output at 29 January 2025, 18:57:30 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, 41181 constraints, 1 objectives
84260 nonzeros

Presolve eliminates 28225 constraints and 17302 variables.
"option presolve 10;" used, but "option presolve 2;" would suffice.
Adjusted problem:
12623 variables:
    6274 binary variables
```

```
6274 integer variables
75 linear variables
12956 constraints, all linear; 33709 nonzeros
15 equality constraints
12941 inequality constraints
1 linear objective; 75 nonzeros.

presolve results:
  variables omitted: 17302
  constraints omitted: 28225
  ranges relaxed: 12868
  bounds improved: 17221
  constraint_drop_tol breakpoints: 0, 0, 96
  nba cycles: 1
  bound row scans: 13146
  row-scan updates: 14
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>: fastimp 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 12623 variables (6274 bin, 6274 int, 0 impl, 75 cont) and 12956 constraints
12956 constraints of type <linear>

original problem has 33709 active (0.0206116%) nonzeros and 33709 (0.0206116%) check nonzeros
```

```
presolving:
(round 1, fast) 5195 del vars, 10315 del conss, 0 add conss, 14 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, 14 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, 14 chg bounds, 0 chg sides, 0 chg coeffs, 1265 upgd conss, 0 impls, 0 clqs
(round 4, exhaustive) 10315 del vars, 10315 del conss, 0 add conss, 14 chg bounds, 0 chg sides, 0 chg coeffs, 2419 upgd conss, 1197 impls, 0 clqs
(0.1s) probing: 51/1154 (4.4%) - 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 4640 active (0.175814%) nonzeros and 4640 (0.175814%) check nonzeros

```
presolving (5 rounds: 5 fast, 3 medium, 3 exhaustive):
11101 deleted vars, 11222 deleted constraints, 0 added constraints, 14 tightened bounds, 0 added holes, 0 changed sides, 0 changed coefficients
2523 implications, 0 cliques
presolved problem has 1522 variables (761 bin, 761 int, 0 impl, 0 cont) and 1734 constraints
1565 constraints of type <varbound>
169 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	1522	1734	1734	0	0	0	0	1.903880e+04	4.726481e+04	148.26%	unknown
0.1s	1	0	560	-	59M	0	1522	1734	1734	0	0	0	0	4.726481e+04	4.726481e+04	0.00%	unknown

```
SCIP Status      : problem is solved [optimal solution found]
Solving Time (sec) : 0.12
Solving Nodes    : 1
Primal Bound     : +4.72648053913779e+04 (1 solutions)
Dual Bound       : +4.72648053913779e+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 47264.80539
560 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	0.888	0.178	23698	4740
Tasks per day	timg	5	0.743	0.149	27310	5462
Hours per day	himg	5	0.736	0.147	35040	7008
Task's Gantt Chart	gimg	5	0.647	0.129	20368	4074
Invoicing Periods Workload	wimg	5	0.586	0.117	22240	4448
Tasks per day (Summary)	timgsum	1	0.173	0.173	6064	6064
Hours per day (Summary)	himgsum	1	0.150	0.150	6912	6912
Task's Gantt Chart (Summary)	gimgsum	1	0.148	0.148	3286	3286
Plot task with its constrains	bing	0	0.000	0.000	0	0

## Statistics on AMPL solution

Total elapsed time: 0.324 [s]

