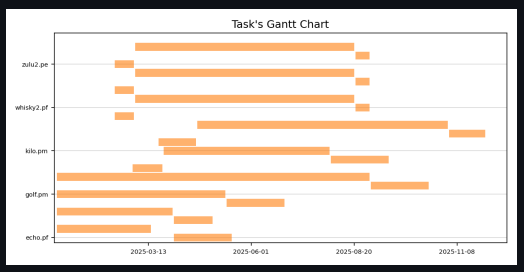
Yumbo. Scheduling, Planning and Resource Allocation

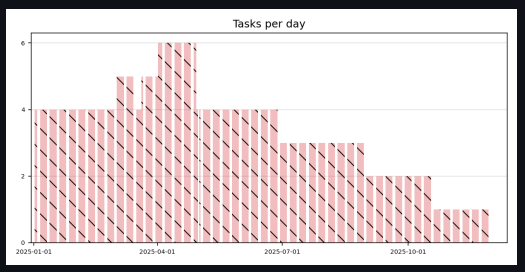
Zbigniew Romanowski, Paweł Koczyk

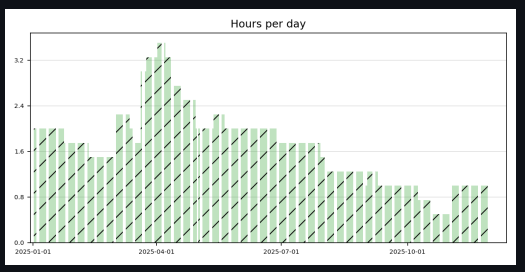
Source code, documentation and sample Excel input files can be found on Yumbo's GitHub repository.

23 January 2025, 10:09:41 AM

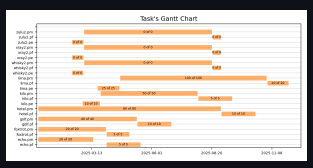
Experts overview

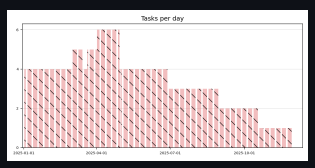


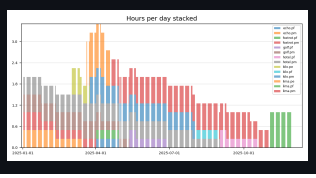


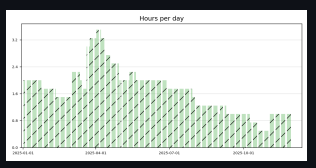


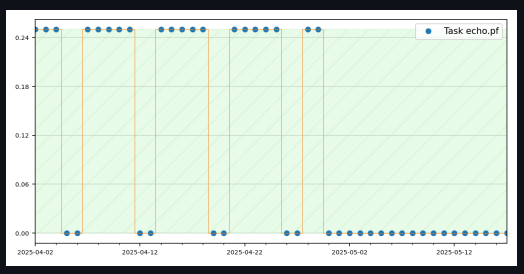
PM.Lisa the 1st unit

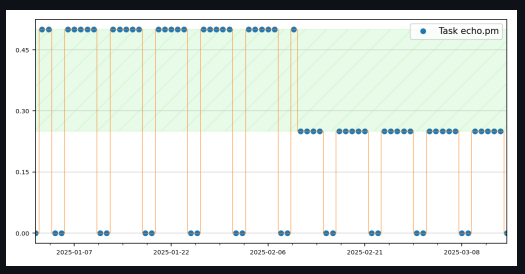


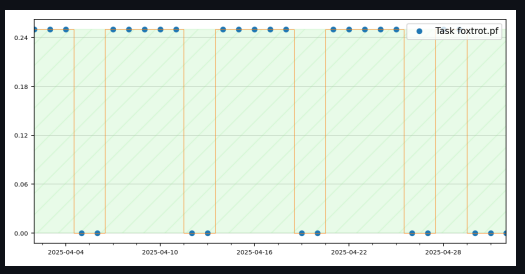


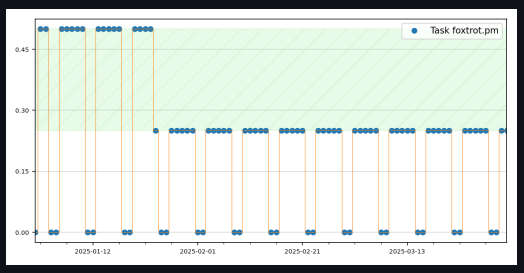


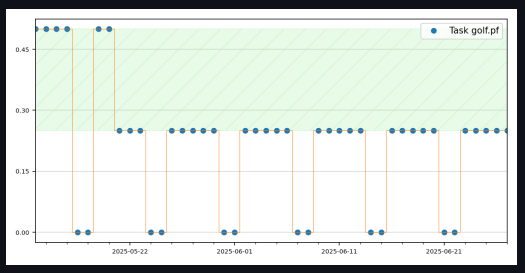


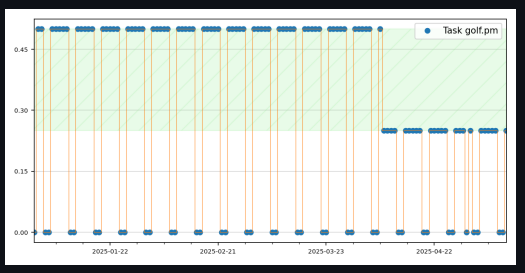


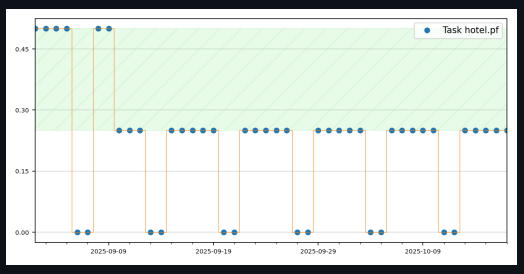


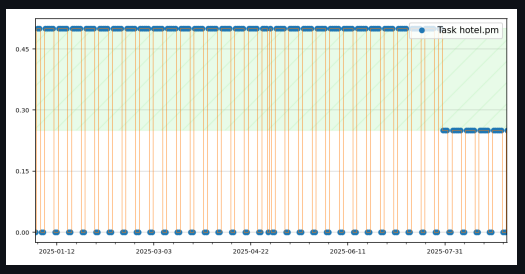


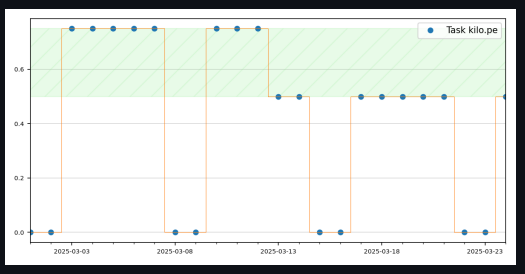


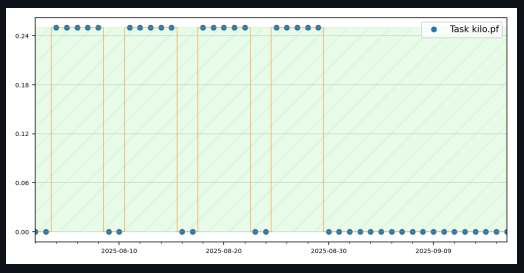


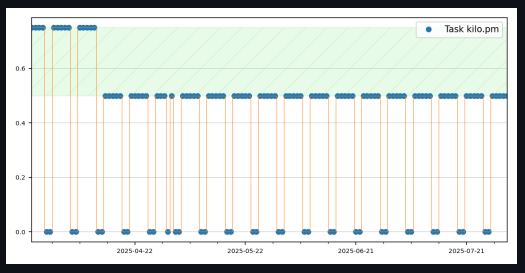


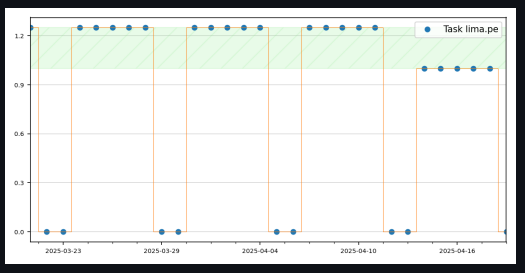


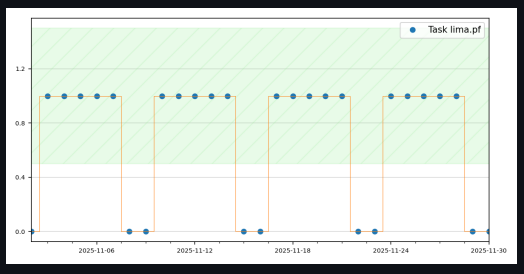


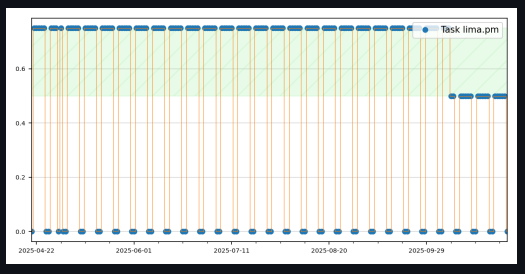


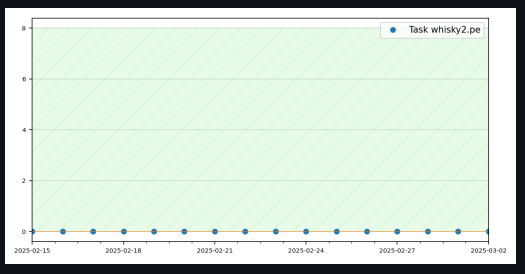


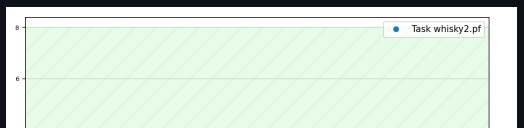


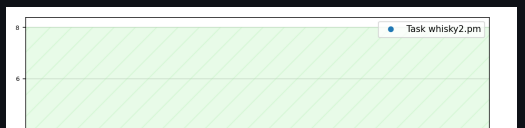


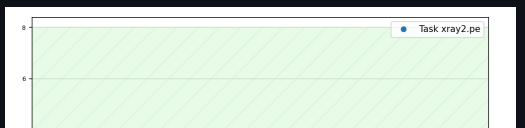


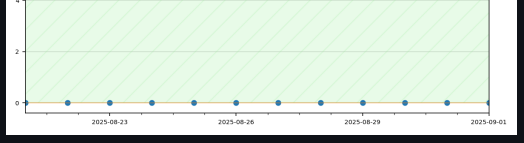
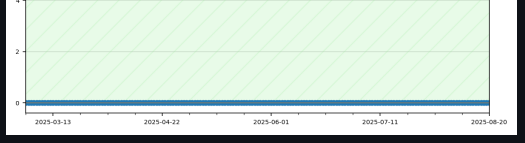
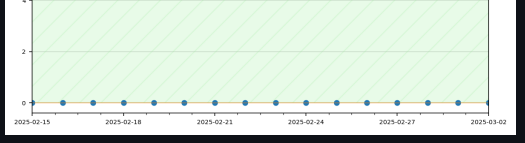
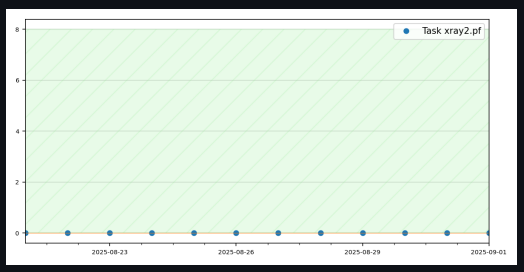


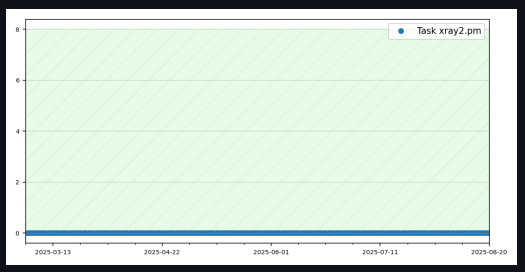


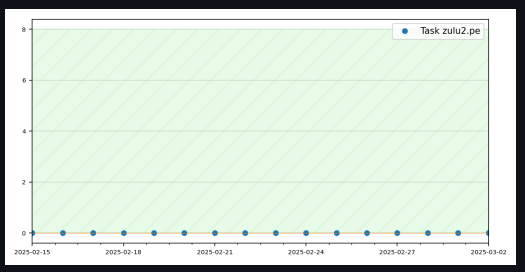


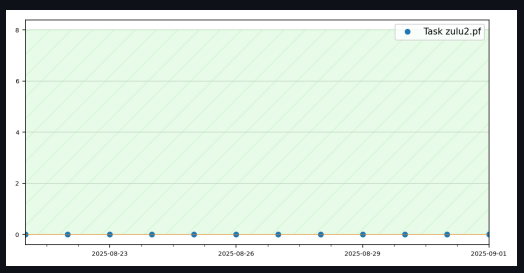


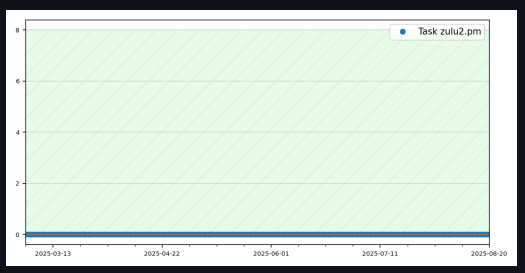










Solver output at 23 January 2025, 10:09:34 AM

```
HiGHS 1.8.1:   tech:outlev = 1
Running HiGHS 1.8.1 (git hash: 4a7f24a): Copyright (c) 2024 HiGHS under MIT licence terms
Coefficient ranges:
  Matrix [1e+00, 3e+01]
  Cost   [1e+00, 1e+00]
  Bound  [1e+00, 2e+02]
  RHS    [2e+01, 4e+02]
Presolving model
185 rows, 889 cols, 1147 nonzeros  0s
13 rows, 803 cols, 803 nonzeros  0s
13 rows, 803 cols, 803 nonzeros  0s

Solving MIP model with:
   13 rows
   803 cols (86 binary, 717 integer, 0 implied int., 0 continuous)
   803 nonzeros
MIP-Timing:       0.0027 - starting analytic centre calculation

Src: B => Branching; C => Central rounding; F => Feasibility pump; H => Heuristic; L => Sub-MIP;
     P => Empty MIP; R => Randomized rounding; S => Solve LP; T => Evaluate node; U => Unbounded;
     z => Trivial zero; l => Trivial lower; u => Trivial upper; p => Trivial point

        Nodes      |    B&B Tree     |            Objective Bounds              | Dynamic Constraints |       Work
Src  Proc. InQueue |  Leaves   Expl. | BestBound       BestSol             Gap |   Cuts   InLp Confl. | LpIters     Time

         0       0         0   0.00%   4073.283446     inf                 inf        0      0      0         0     0.0s
 T       0       0         0   0.00%   4073.283446     5807.289766       29.86%       0      0      0        13     0.0s
         1       0         1 100.00%   5807.289766     5807.289766        0.00%       0      0      0        13     0.0s

Solving report
  Status            Optimal
  Primal bound      5807.28976564
  Dual bound        5807.28976564
  Gap               0% (tolerance: 0.01%)
  P-D integral      4.84090084783e-06
  Solution status   feasible
                    5807.28976564 (objective)
                    0 (bound viol.)
                    0 (int. viol.)
                    0 (row viol.)
  Timing            0.00 (total)
                    0.00 (presolve)
                    0.00 (solve)
                    0.00 (postsolve)
  Max sub-MIP depth 0
  Nodes             1
  Repair LPs        0 (0 feasible; 0 iterations)
  LP iterations     13 (total)
                    0 (strong br.)
                    0 (separation)
                    0 (heuristics)
HiGHS 1.8.1: optimal solution; objective 5807.289766
13 simplex iterations
1 branching nodes

"option abs_boundtol 2.842170943040401e-14;"
or "option rel_boundtol 1.5786024397762919e-16;"
will change deduced dual values.
```

Elapsed time for chart creation

Chart title	Chart short name	Number of calls	Elapsed time [s]
Hours per day stacked	simg	1	2.475
Plot task with its constrains	bimg	23	2.450
Tasks per day	timg	1	0.318
Hours per day	himg	1	0.309
Task's Gantt Chart	gimg	1	0.170
Invoicing Periods Workload	wimg	1	0.105