

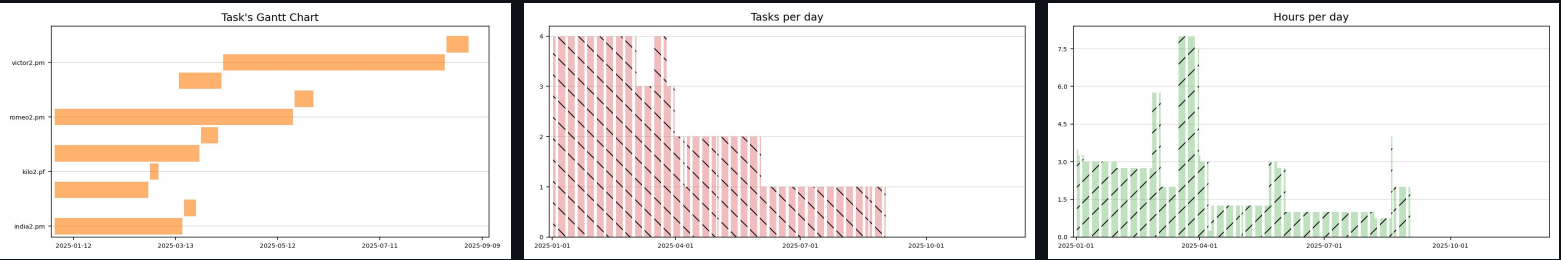
Yumbo. Scheduling, Planning and Resource Allocation

Zbigniew Romanowski, Paweł Koczyk

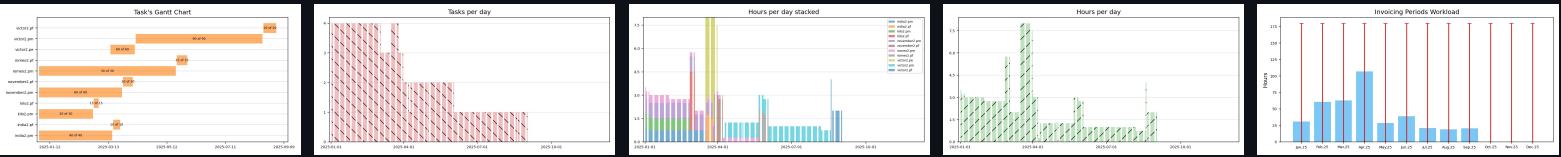
Source code, documentation and sample Excel input files can be found on [Yumbo's](#) GitHub repository.

28 January 2025, 13:58:08 PM

Experts overview



PM.Fabian the 2nd unit

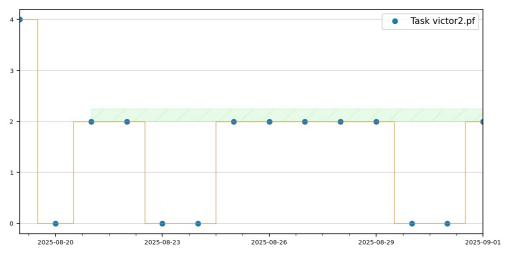
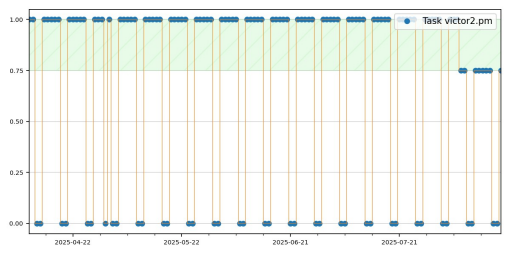
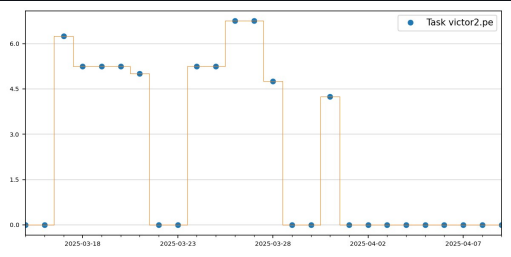
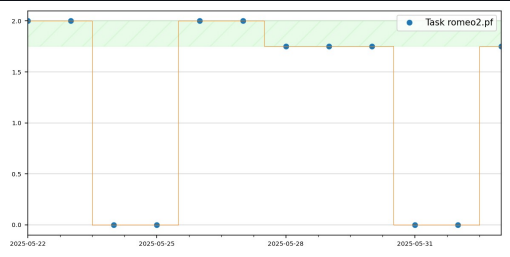
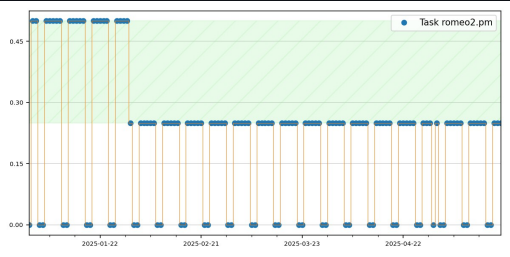
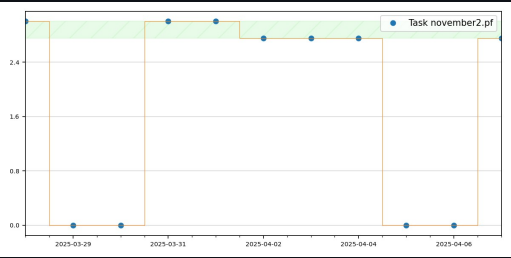
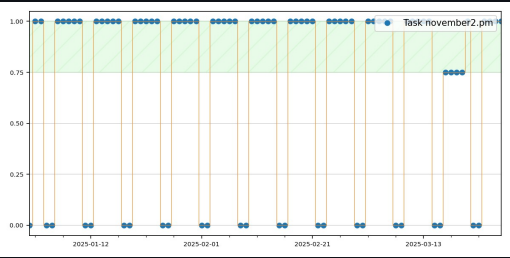
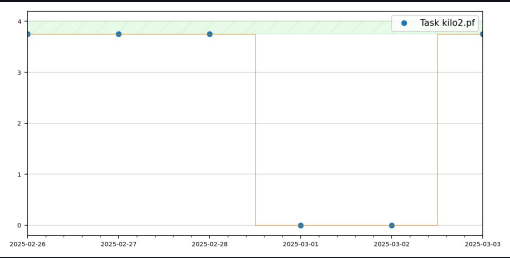
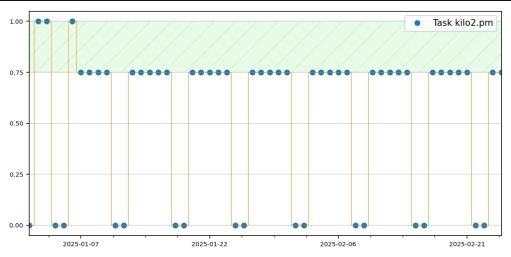
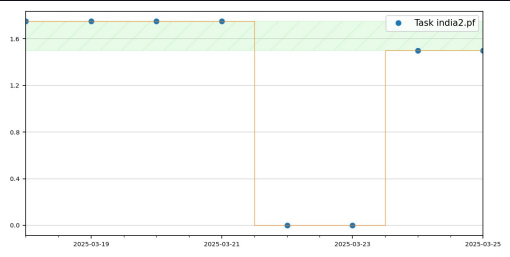
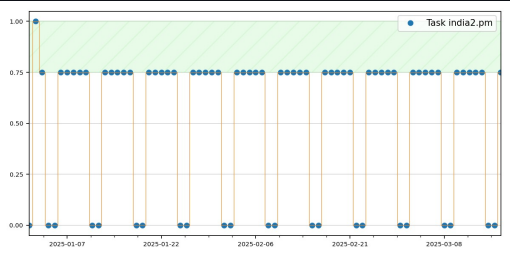


	Weekdays	india2.pm	india2.pf	kilo2.pm	kilo2.pf	november2.pm	november2.pf	romeo2.pm	romeo2.pf	victor2.pe	victor2.pm	victor2.pf
2025-01-01	Wednesday											
2025-01-02	Thursday	1.00		1.00		1.00		0.50				
2025-01-03	Friday	0.75		1.00		1.00		0.50				
2025-01-04	Saturday											
2025-01-05	Sunday											
2025-01-06	Monday	0.75		1.00		1.00		0.50				
2025-01-07	Tuesday	0.75		0.75		1.00		0.50				
2025-01-08	Wednesday	0.75		0.75		1.00		0.50				
2025-01-09	Thursday	0.75		0.75		1.00		0.50				
2025-01-10	Friday	0.75		0.75		1.00		0.50				
2025-01-11	Saturday											
2025-01-12	Sunday											
2025-01-13	Monday	0.75		0.75		1.00		0.50				
2025-01-14	Tuesday	0.75		0.75		1.00		0.50				
2025-01-15	Wednesday	0.75		0.75		1.00		0.50				
2025-01-16	Thursday	0.75		0.75		1.00		0.50				
2025-01-17	Friday	0.75		0.75		1.00		0.50				
2025-01-18	Saturday											
2025-01-19	Sunday											
2025-01-20	Monday	0.75		0.75		1.00		0.50				
2025-01-21	Tuesday	0.75		0.75		1.00		0.50				
2025-01-22	Wednesday	0.75		0.75		1.00		0.50				
2025-01-23	Thursday	0.75		0.75		1.00		0.50				
2025-01-24	Friday	0.75		0.75		1.00		0.50				
2025-01-25	Saturday											
2025-01-26	Sunday											
2025-01-27	Monday	0.75		0.75		1.00		0.50				
2025-01-28	Tuesday	0.75		0.75		1.00		0.50				
2025-01-29	Wednesday	0.75		0.75		1.00		0.50				
2025-01-30	Thursday	0.75		0.75		1.00		0.50				
2025-01-31	Friday	0.75		0.75		1.00		0.25				
2025-02-01	Saturday											
2025-02-02	Sunday											
2025-02-03	Monday	0.75		0.75		1.00		0.25				
2025-02-04	Tuesday	0.75		0.75		1.00		0.25				
2025-02-05	Wednesday	0.75		0.75		1.00		0.25				
2025-02-06	Thursday	0.75		0.75		1.00		0.25				
2025-02-07	Friday	0.75		0.75		1.00		0.25				
2025-02-08	Saturday											
2025-02-09	Sunday											
2025-02-10	Monday	0.75		0.75		1.00		0.25				
2025-02-11	Tuesday	0.75		0.75		1.00		0.25				

	Weekdays	india2.pm	india2.pf	kilo2.pm	kilo2.pf	november2.pm	november2.pf	romeo2.pm	romeo2.pf	victor2.pe	victor2.pm	victor2.pf
2025-02-12	Wednesday	0.75		0.75		1.00		0.25				
2025-02-13	Thursday	0.75		0.75		1.00		0.25				
2025-02-14	Friday	0.75		0.75		1.00		0.25				
2025-02-15	Saturday											
2025-02-16	Sunday											
2025-02-17	Monday	0.75		0.75		1.00		0.25				
2025-02-18	Tuesday	0.75		0.75		1.00		0.25				
2025-02-19	Wednesday	0.75		0.75		1.00		0.25				
2025-02-20	Thursday	0.75		0.75		1.00		0.25				
2025-02-21	Friday	0.75		0.75		1.00		0.25				
2025-02-22	Saturday											
2025-02-23	Sunday											
2025-02-24	Monday	0.75		0.75		1.00		0.25				
2025-02-25	Tuesday	0.75		0.75		1.00		0.25				
2025-02-26	Wednesday	0.75			3.75	1.00		0.25				
2025-02-27	Thursday	0.75			3.75	1.00		0.25				
2025-02-28	Friday	0.75			3.75	1.00		0.25				
2025-03-01	Saturday											
2025-03-02	Sunday											
2025-03-03	Monday	0.75			3.75	1.00		0.25				
2025-03-04	Tuesday	0.75				1.00		0.25				
2025-03-05	Wednesday	0.75				1.00		0.25				
2025-03-06	Thursday	0.75				1.00		0.25				
2025-03-07	Friday	0.75				1.00		0.25				
2025-03-08	Saturday											
2025-03-09	Sunday											
2025-03-10	Monday	0.75				1.00		0.25				
2025-03-11	Tuesday	0.75				1.00		0.25				
2025-03-12	Wednesday	0.75				1.00		0.25				
2025-03-13	Thursday	0.75				1.00		0.25				
2025-03-14	Friday	0.75				1.00		0.25				
2025-03-15	Saturday											
2025-03-16	Sunday											
2025-03-17	Monday	0.75				0.75		0.25		6.25		
2025-03-18	Tuesday		1.75			0.75		0.25		5.25		
2025-03-19	Wednesday		1.75			0.75		0.25		5.25		
2025-03-20	Thursday		1.75			0.75		0.25		5.25		
2025-03-21	Friday		1.75			1.00		0.25		5.00		
2025-03-22	Saturday											
2025-03-23	Sunday											
2025-03-24	Monday		1.50			1.00		0.25		5.25		
2025-03-25	Tuesday		1.50			1.00		0.25		5.25		
2025-03-26	Wednesday					1.00		0.25		6.75		
2025-03-27	Thursday					1.00		0.25		6.75		
2025-03-28	Friday						3.00	0.25		4.75		
2025-03-29	Saturday											
2025-03-30	Sunday											
2025-03-31	Monday						3.00	0.25		4.25		
2025-04-01	Tuesday						3.00	0.25				
2025-04-02	Wednesday						2.75	0.25				
2025-04-03	Thursday						2.75	0.25				
2025-04-04	Friday						2.75	0.25				
2025-04-05	Saturday											
2025-04-06	Sunday											
2025-04-07	Monday						2.75	0.25				
2025-04-08	Tuesday							0.25				
2025-04-09	Wednesday							0.25				
2025-04-10	Thursday							0.25			1.00	
2025-04-11	Friday							0.25			1.00	
2025-04-12	Saturday											
2025-04-13	Sunday											
2025-04-14	Monday							0.25			1.00	
2025-04-15	Tuesday							0.25			1.00	
2025-04-16	Wednesday							0.25			1.00	
2025-04-17	Thursday							0.25			1.00	

	Weekdays	india2.pm	india2.pf	kilo2.pm	kilo2.pf	november2.pm	november2.pf	romeo2.pm	romeo2.pf	victor2.pm	victor2.pf
2025-08-26	Tuesday										2.00
2025-08-27	Wednesday										2.00
2025-08-28	Thursday										2.00
2025-08-29	Friday										2.00
2025-08-30	Saturday										
2025-08-31	Sunday										
2025-09-01	Monday										2.00

☐ Show schedule as Streamlit table



Solver output at 28 January 2025, 13:58:08 PM

```
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, 6e+01]
  RHS     [3e+01, 4e+02]
Presolving model
68 rows, 413 cols, 532 nonzeros 0s
66 rows, 351 cols, 468 nonzeros 0s

Solving MIP model with:
  66 rows
  351 cols (60 binary, 291 integer, 0 implied int., 0 continuous)
  468 nonzeros
MIP-Timing: 0.0028 - 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	
R	0	0	0	0.00%	3314.175966	inf	inf	0	0	0	0	0.0s	
	0	0	0	0.00%	4339.796439	4339.796439	0.00%	0	0	0	35	0.0s	
	1	0	1	100.00%	4339.796439	4339.796439	0.00%	0	0	0	45	0.0s	

Solving report

Status: Optimal

Primal bound: 4339.79643874

Dual bound: 4339.79643874

Gap: 0% (tolerance: 0.01%)

P-D integral: 0

Solution status: feasible

4339.79643874 (objective)

0 (bound viol.)

0 (int. viol.)

0 (row viol.)

```
Timing          0.01 (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   45 (total)
                0 (strong br.)
                0 (separation)
                0 (heuristics)

HiGHS 1.8.1: optimal solution; objective 4339.796439
45 simplex iterations
1 branching nodes
```

Elapsed time for chart creation

Chart title	Chart short name	Number of calls	Elapsed time [s]	Average time per chart [s]
Hours per day stacked	simg	1	2.052	2.052
Plot task with its constrains	bimg	11	1.065	0.097
Tasks per day	timg	1	0.310	0.310
Hours per day	himg	1	0.293	0.293
Task's Gantt Chart	gimg	1	0.136	0.136
Invoicing Periods Workload	wimg	1	0.106	0.106