

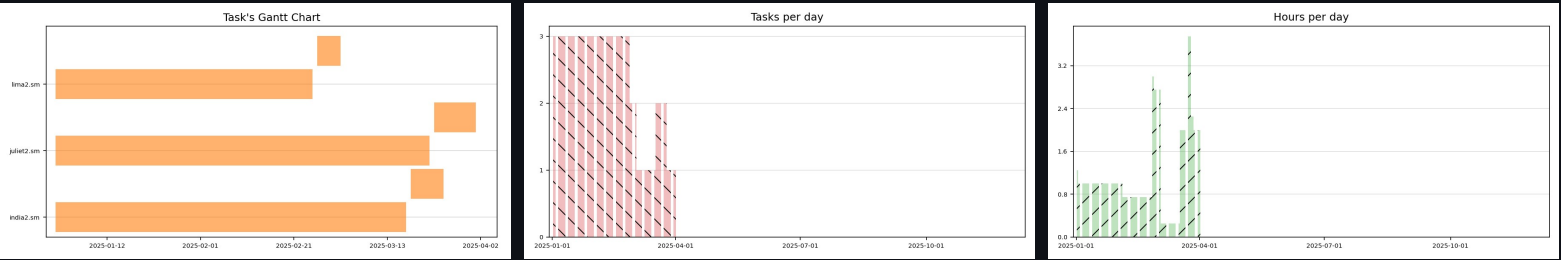
# Yumbo. Scheduling, Planning and Resource Allocation

Zbigniew Romanowski, Paweł Koczyk

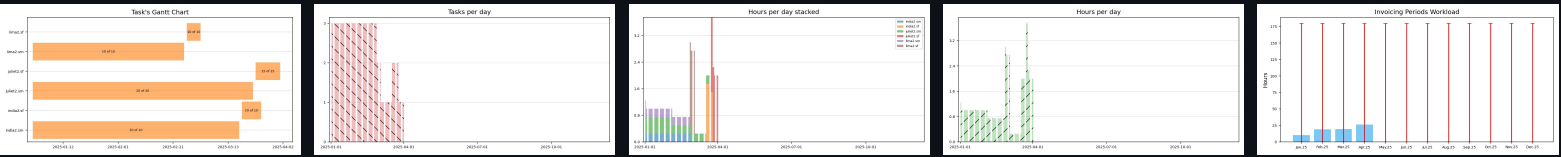
Source code, documentation and sample Excel input files can be found on [Yumbo's](#) GitHub repository.

28 January 2025, 14:02:44 PM

## Experts overview



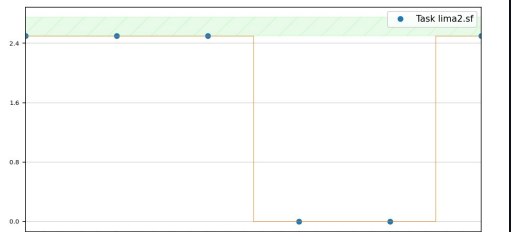
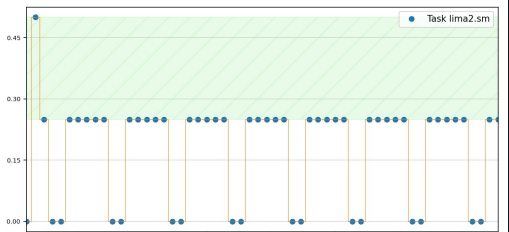
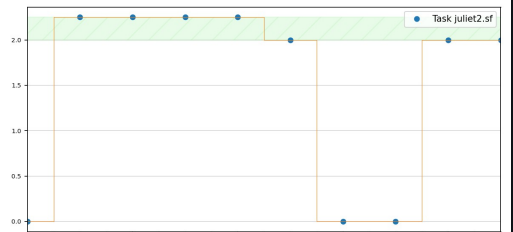
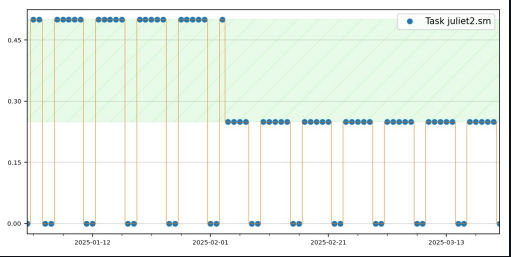
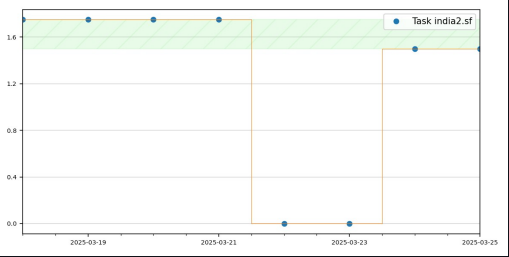
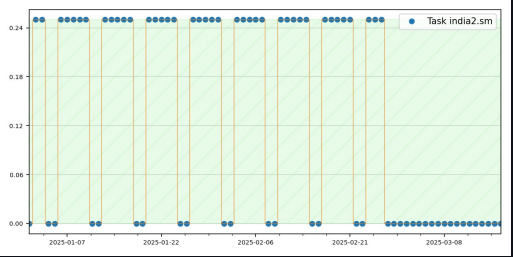
## SA.Justin the 2nd unit



	Weekdays	india2.sm	india2.sf	juliet2.sm	juliet2.sf	lima2.sm	lima2.sf
2025-01-01	Wednesday						
2025-01-02	Thursday	0.25		0.50		0.50	
2025-01-03	Friday	0.25		0.50		0.25	
2025-01-04	Saturday						
2025-01-05	Sunday						
2025-01-06	Monday	0.25		0.50		0.25	
2025-01-07	Tuesday	0.25		0.50		0.25	
2025-01-08	Wednesday	0.25		0.50		0.25	
2025-01-09	Thursday	0.25		0.50		0.25	
2025-01-10	Friday	0.25		0.50		0.25	
2025-01-11	Saturday						
2025-01-12	Sunday						
2025-01-13	Monday	0.25		0.50		0.25	
2025-01-14	Tuesday	0.25		0.50		0.25	
2025-01-15	Wednesday	0.25		0.50		0.25	
2025-01-16	Thursday	0.25		0.50		0.25	
2025-01-17	Friday	0.25		0.50		0.25	
2025-01-18	Saturday						
2025-01-19	Sunday						
2025-01-20	Monday	0.25		0.50		0.25	
2025-01-21	Tuesday	0.25		0.50		0.25	
2025-01-22	Wednesday	0.25		0.50		0.25	
2025-01-23	Thursday	0.25		0.50		0.25	
2025-01-24	Friday	0.25		0.50		0.25	
2025-01-25	Saturday						
2025-01-26	Sunday						
2025-01-27	Monday	0.25		0.50		0.25	
2025-01-28	Tuesday	0.25		0.50		0.25	
2025-01-29	Wednesday	0.25		0.50		0.25	
2025-01-30	Thursday	0.25		0.50		0.25	
2025-01-31	Friday	0.25		0.50		0.25	
2025-02-01	Saturday						
2025-02-02	Sunday						
2025-02-03	Monday	0.25		0.50		0.25	
2025-02-04	Tuesday	0.25		0.25		0.25	
2025-02-05	Wednesday	0.25		0.25		0.25	
2025-02-06	Thursday	0.25		0.25		0.25	
2025-02-07	Friday	0.25		0.25		0.25	
2025-02-08	Saturday						
2025-02-09	Sunday						
2025-02-10	Monday	0.25		0.25		0.25	
2025-02-11	Tuesday	0.25		0.25		0.25	

	Weekdays	india2.sm	india2.sf	juliet2.sm	juliet2.sf	lima2.sm	lima2.sf
2025-02-12	Wednesday	0.25		0.25		0.25	
2025-02-13	Thursday	0.25		0.25		0.25	
2025-02-14	Friday	0.25		0.25		0.25	
2025-02-15	Saturday						
2025-02-16	Sunday						
2025-02-17	Monday	0.25		0.25		0.25	
2025-02-18	Tuesday	0.25		0.25		0.25	
2025-02-19	Wednesday	0.25		0.25		0.25	
2025-02-20	Thursday	0.25		0.25		0.25	
2025-02-21	Friday	0.25		0.25		0.25	
2025-02-22	Saturday						
2025-02-23	Sunday						
2025-02-24	Monday	0.25		0.25		0.25	
2025-02-25	Tuesday	0.25		0.25		0.25	
2025-02-26	Wednesday	0.25		0.25			2.50
2025-02-27	Thursday			0.25			2.50
2025-02-28	Friday			0.25			2.50
2025-03-01	Saturday						
2025-03-02	Sunday						
2025-03-03	Monday			0.25			2.50
2025-03-04	Tuesday			0.25			
2025-03-05	Wednesday			0.25			
2025-03-06	Thursday			0.25			
2025-03-07	Friday			0.25			
2025-03-08	Saturday						
2025-03-09	Sunday						
2025-03-10	Monday			0.25			
2025-03-11	Tuesday			0.25			
2025-03-12	Wednesday			0.25			
2025-03-13	Thursday			0.25			
2025-03-14	Friday			0.25			
2025-03-15	Saturday						
2025-03-16	Sunday						
2025-03-17	Monday			0.25			
2025-03-18	Tuesday		1.75	0.25			
2025-03-19	Wednesday		1.75	0.25			
2025-03-20	Thursday		1.75	0.25			
2025-03-21	Friday		1.75	0.25			
2025-03-22	Saturday						
2025-03-23	Sunday						
2025-03-24	Monday		1.50		2.25		
2025-03-25	Tuesday		1.50		2.25		
2025-03-26	Wednesday				2.25		
2025-03-27	Thursday				2.25		
2025-03-28	Friday				2.00		
2025-03-29	Saturday						
2025-03-30	Sunday						
2025-03-31	Monday				2.00		
2025-04-01	Tuesday				2.00		

☐ Show schedule as Streamlit table



2025-03-23

2025-03-25

2025-03-27

2025-03-29

2025-03-31

2025-01-07

2025-01-22

2025-02-06

2025-02-21

2025-02-26

2025-02-27

2025-02-28

2025-03-01

2025-03-02

2025-03-03

Solver output at 28 January 2025, 14:02:45 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, 4e+01]

RHS [4e+01, 8e+01]

Presolving model

111 rows, 215 cols, 374 nonzeros 0s

5 rows, 162 cols, 162 nonzeros 0s

4 rows, 123 cols, 123 nonzeros 0s

4 rows, 123 cols, 123 nonzeros 0s

Solving MIP model with:

4 rows

123 cols (53 binary, 70 integer, 0 implied int., 0 continuous)

123 nonzeros

MIP-Timing: 0.0017 - 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
T	0	0	0	0.00%	472.0273262	inf	inf	0	0	0	0	0.0s
	0	0	0	0.00%	472.0273262	653.2268714	27.74%	0	0	0	4	0.0s
	1	0	1	100.00%	653.2268714	653.2268714	0.00%	0	0	0	4	0.0s

Solving report

StatusOptimal

Primal bound653.226871405

Dual bound653.226871405

Gap0% (tolerance: 0.01%)

P-D integral4.69560445188e-06

Solution statusfeasible

653.226871405 (objective)

0 (bound viol.)

0 (int. viol.)

0 (row viol.)

Timing0.00 (total)

0.00 (presolve)

0.00 (solve)

0.00 (postsolve)

Max sub-MIP depth0

Nodes1

Repair LPs0 (0 feasible; 0 iterations)

LP iterations4 (total)

0 (strong br.)

0 (separation)

0 (heuristics)

HiGHS 1.8.1: optimal solution; objective 653.2268714

4 simplex iterations

1 branching nodes

absmipgap=1.13687e-13, relmipgap=0

## 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	1.064	1.064
Plot task with its constrains	bimg	6	0.876	0.146
Tasks per day	timg	1	0.304	0.304
Hours per day	himg	1	0.295	0.295
Invoicing Periods Workload	wimg	1	0.115	0.115
Task's Gantt Chart	gimg	1	0.102	0.102