

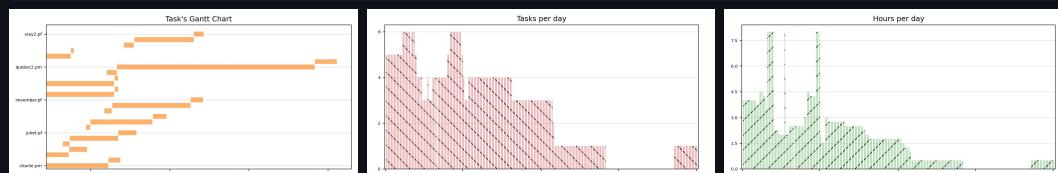
# Yumbo. Scheduling, Planning and Resource Allocation

Zbigniew Romanowski, Paweł Koczyk

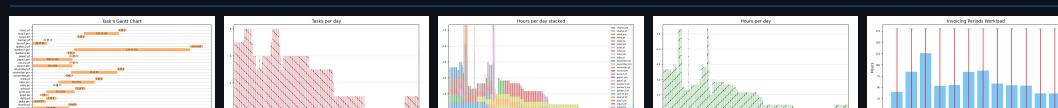
Source code, documentation and sample Excel input files can be found on [Yumbo](#) GitHub repository.

28 January 2025, 13:43:40 PM

## Experts overview



## PM.Angel the 1st unit



	Weekdays	charlie.pm	charlie(pf)	delta.pm	delta(pf)	juliet.pe	juliet(pf)	mike.pe	mike(pf)	november.pe	november(pf)	oscar2.pm	oscar2(pf)	papa2.pm	papa2(pf)	quebec2.pe	quebec2(pf)	quebec2.pm	quebec2(pf)	sierra2.pm	sierra2(pf)	xray2.pe	xray2(pm)	xray2(pf)	
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2025-01-03	Friday	0.75			0.75																			1.00	
2025-01-04	Saturday																								
2025-01-05	Sunday																								
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2025-01-12	Sunday																								
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2025-02-16	Sunday																								
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2025-02-22	Saturday																								
2025-02-23	Sunday																								
2025-02-24	Monday	0.75		0.50		0.75																		0.75	
2025-02-25	Tuesday	0.75		0.50		0.75																		0.75	
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2025-03-12	Wednesday	0.75		0.25		5.75												0.50		0.75					
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2025-03-16	Sunday																							
2025-03-17	Monday	0.75				0.25									0.50	0.75								
2025-03-18	Tuesday	0.75				0.25									0.50	0.75								
2025-03-19	Wednesday	0.75				0.25									0.50	0.75								
2025-03-20	Thursday	0.75				0.25									0.50	0.75								
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2025-03-23	Sunday																							
2025-03-24	Monday	0.75				0.25									0.50	0.75								
2025-03-25	Tuesday	0.75				0.25									0.50	0.75								
2025-03-26	Wednesday	0.75				0.25									0.50	0.75								
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2025-03-28	Friday	0.75													0.50	0.75								
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2025-04-03	Thursday	0.75													0.50	0.75								
2025-04-04	Friday	0.75													0.50	0.75								
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2025-05-02	Friday	0.75					0.50								0.50	0.75								
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2025-05-31	Saturday																							
2025-06-01	Sunday																							
2025-06-02	Monday	0.50						0.50								0.50	0.75							
2025-06-03	Tuesday	0.50						0.50								0.50								

Weekdays	charlie.pm	charlie(pf)	delta.pm	delta(pf)	juliet.pe	juliet.pm	mike.pe	mike.pm	november.pe	november.pm	november(pf)	oscar2.pm	oscar2(pf)	papa2.pm	papa2(pf)	quebec2.pe	quebec2.pm	quebec2(pf)	sierra2.pm	sierra2(pf)	xray2.pe	xray2.pm	xray2(pf)
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2025-06-29	Sunday																						
2025-06-30	Monday	0.50						0.25		0.25		3.50		3.50									
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2025-07-03	Thursday	0.50						0.50		0.50													
2025-07-04	Friday	0.50						0.50		0.50													
2025-07-05	Saturday																						
2025-07-06	Sunday																						
2025-07-07	Monday							0.50		0.50													
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2025-07-09	Wednesday							0.50		0.50													
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2025-08-31	Sunday																						
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2025-09-02	Tuesday							0.25		0.50													1.25
2025-09-03	Wednesday							0.25		0.50													1.25
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2025-09-05	Friday							0.25		0.50													1.25
2025-09-06	Saturday																						
2025-09-07	Sunday																						
2025-09-08	Monday							0.25		0.50													1.25
2025-09-09	Tuesday							0.25		0.50													1.25
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2025-09-11	Thursday							0.25		0.50													



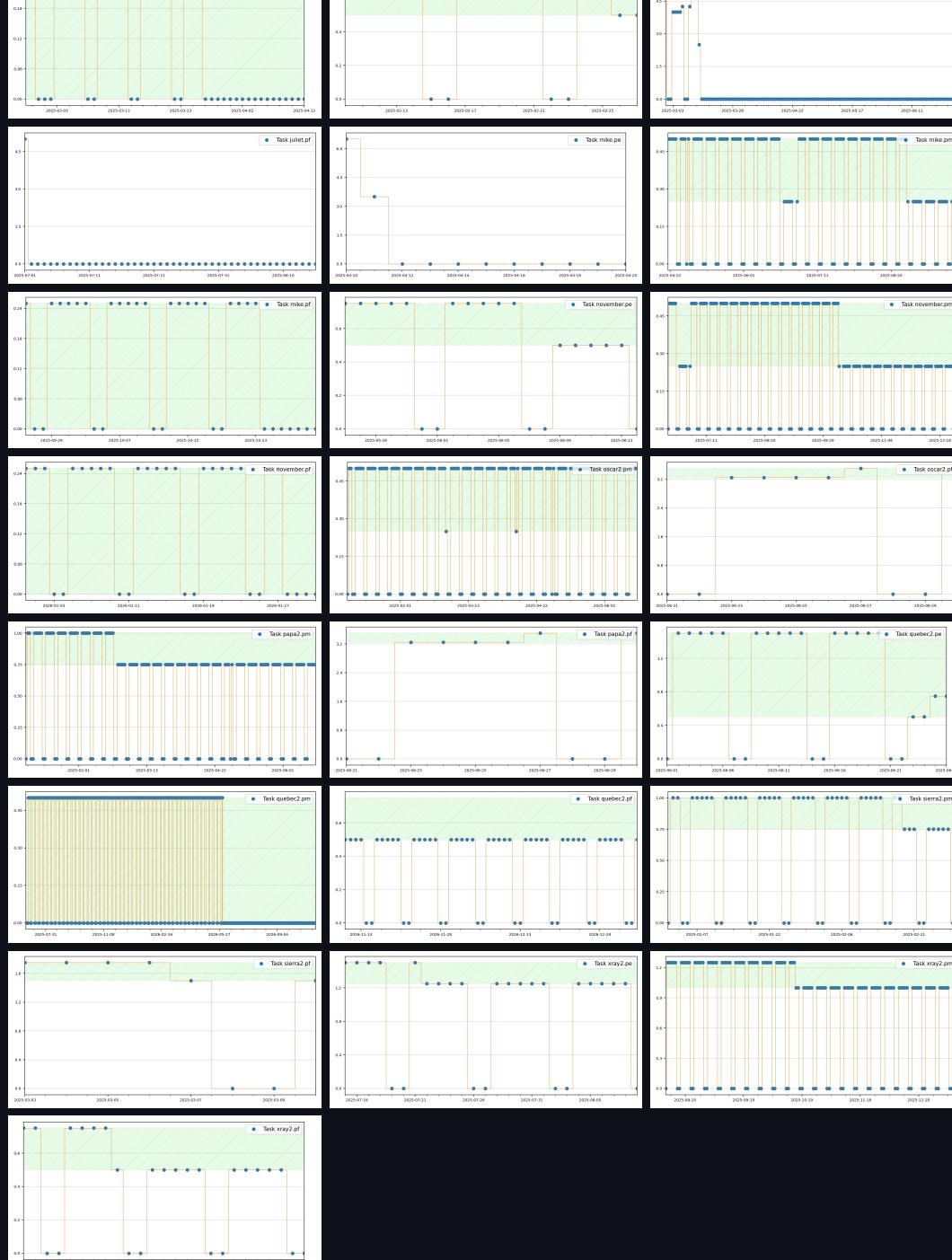


Weekdays	charlie.pm	charlie(pf)	delta.pm	delta(pf)	juliet.pe	juliet.pm	mike.pe	mike.pm	november.pe	november.pm	november(pf)	oscar2.pm	oscar2(pf)	papa2.pm	papa2(pf)	quebec2.pe	quebec2(pm)	quebec2(pf)	sierra2.pm	sierra2(pf)	xray2.pe	xray2(pm)	xray2(pf)
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2026-04-05																							
2026-04-06																						0.50	
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2026-07-04																							
2026-07-05																							



Weekdays	charlie.pm	charlie(pf)	delta.pm	delta(pf)	juliet.pe	juliet(pm)	mike.pe	mike(pm)	november.pe	november(pm)	november(pf)	oscar2.pm	oscar2(pf)	papa2.pm	papa2(pf)	quebec2.pe	quebec2(pm)	quebec2(pf)	sierra2.pm	sierra2(pf)	xray2.pe	xray2.pm	xray2(pf)
2026-10-12	Monday																						
2026-10-13	Tuesday																						
2026-10-14	Wednesday																						
2026-10-15	Thursday																						
2026-10-16	Friday																						
2026-10-17	Saturday																						
2026-10-18	Sunday																						
2026-10-19	Monday																						
2026-10-20	Tuesday																						
2026-10-21	Wednesday																						
2026-10-22	Thursday																						
2026-10-23	Friday																						
2026-10-24	Saturday																						
2026-10-25	Sunday																						
2026-10-26	Monday																						
2026-10-27	Tuesday																						
2026-10-28	Wednesday																						
2026-10-29	Thursday																						
2026-10-30	Friday																						
2026-10-31	Saturday																						
2026-11-01	Sunday																						
2026-11-02	Monday																						
2026-11-03	Tuesday																						
2026-11-04	Wednesday																						
2026-11-05	Thursday																						
2026-11-06	Friday																						
2026-11-07	Saturday																						
2026-11-08	Sunday																						
2026-11-09	Monday																						
2026-11-10	Tuesday																			0.50			
2026-11-11	Wednesday																			0.50			
2026-11-12	Thursday																			0.50			
2026-11-13	Friday																			0.50			
2026-11-14	Saturday																						
2026-11-15	Sunday																						
2026-11-16	Monday																			0.50			
2026-11-17	Tuesday																			0.50			
2026-11-18	Wednesday																			0.50			
2026-11-19	Thursday																			0.50			
2026-11-20	Friday																			0.50			
2026-11-21	Saturday																						
2026-11-22	Sunday																						
2026-11-23	Monday																			0.50			
2026-11-24	Tuesday																			0.50			
2026-11-25	Wednesday																			0.50			
2026-11-26	Thursday																			0.50			
2026-11-27	Friday																			0.50			
2026-11-28	Saturday																						
2026-11-29	Sunday																						
2026-11-30	Monday																			0.50			
2026-12-01	Tuesday																			0.50			
2026-12-02	Wednesday																			0.50			
2026-12-03	Thursday																			0.50			
2026-12-04	Friday																			0.50			
2026-12-05	Saturday																						
2026-12-06	Sunday																						
2026-12-07	Monday																			0.50			
2026-12-08	Tuesday																			0.50			
2026-12-09	Wednesday																			0.50			
2026-12-10	Thursday																			0.50			
2026-12-11	Friday																			0.50			
2026-12-12	Saturday																						
2026-12-13	Sunday																						
2026-12-14	Monday																			0.50			
2026-12-15	Tuesday																			0.50			
2026-12-16	Wednesday																			0.50			
2026-12-17	Thursday																			0.50			
2026-12-18	Friday																			0.50			
2026-12-19	Saturday																						
2026-12-20	Sunday																						
2026-12-21	Monday																			0.50			
2026-12-22	Tuesday																			0.50			
2026-12-23	Wednesday																			0.50			
2026-12-24	Thursday																			0.50			
2026-12-25	Friday																			0.50			
2026-12-26	Saturday																						
2026-12-27	Sunday																						
2026-12-28	Monday																			0.50			
2026-12-29	Tuesday																			0.50			
2026-12-30	Wednesday																			0.50			
2026-12-31	Thursday																			0.50			
2027-01-01	Friday																			0.50			
2027-01-02	Saturday																						
2027-01-03	Sunday																						
2027-01-04	Monday																			0.50			





### Solver output at 28 January 2025, 13:42:22 PM

```

HIGHS 1.8.1: tec: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, 7e+02]
Resolving model
1243 rows, 2649 cols, 4598 nonzeros 0s
1673 rows, 1964 cols, 4243 nonzeros 0s

Solving MIP model with:
 1673 rows
 1964 cols (910 binary, 1054 integer, 0 implied int., 0 continuous)
 4243 nonzeros
MIP-timing: 0.019 - 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.  UpIters Time
R    0     0       0  0.00%  7398.610836      inf      inf      0      0      0      0  0.0s
R    0     0       0  0.00% 12589.011159 12589.011159  0.00%      0      0      0      313  0.0s
R    1     0       1 100.00% 12589.011159 12589.011159  0.00%      0      0      0      324  0.0s

Solving report
  Status      Optimal
  Primal_bound 12589.011159
  Dual bound 12589.011159
  Gap 0% (tolerance: 0.01%)
  P-D integral 1.04244182079e-18
  Solution status feasible
  12589.011159 (objective)
  0 (bound viol.)
  0 (int. viol.)
  0 (row viol.)
Timing 0.04 (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 324 (total)
  0 (strong br.)
  0 (separation)
  0 (heuristics)

HIGHS 1.8.1: optimal solution; objective 12589.01116
324 simplex iterations
1 branching nodes
absmipgap 1.81899e-12, relmipgap=2.90829e-16

```

