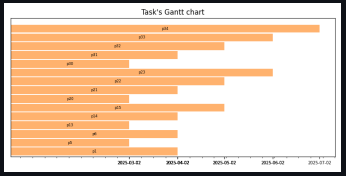
Yumbo. Scheduling, Planning and Resource Allocation

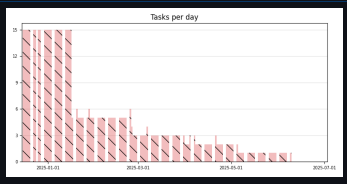
Zbigniew Romanowski, Paweł Koczyk

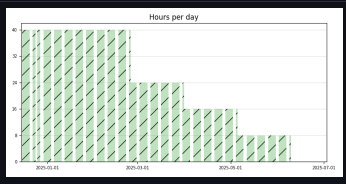
Source code, documentation and sample Excel input files can be found on Yumbo's GitHub repository.

12 January 2025, 17:50:54 PM

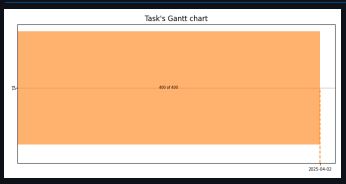
All experts overview

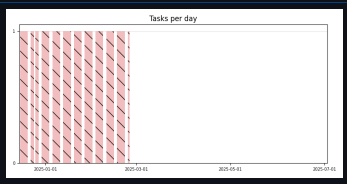


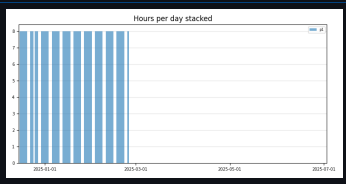




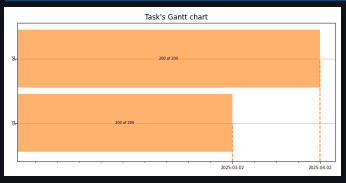
Alojzy 1 task per day

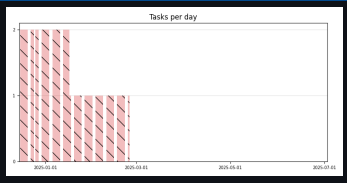


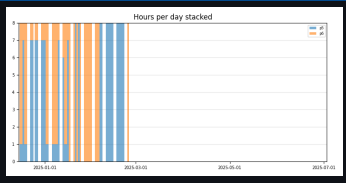




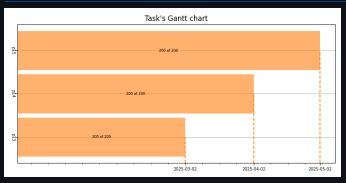
Eugeniusz 2 tasks per day

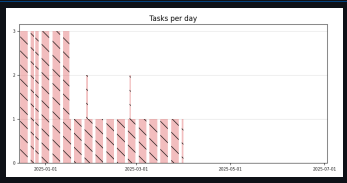


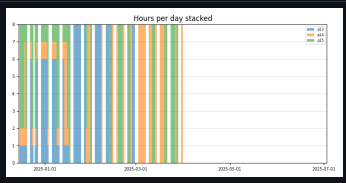




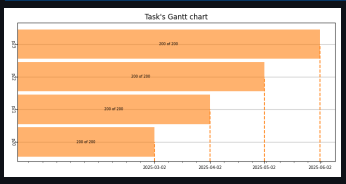
Ignacy 3 tasks per day

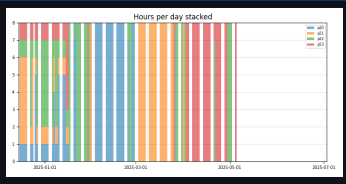




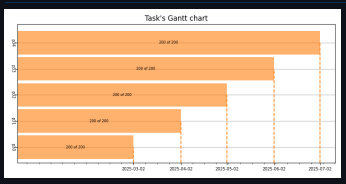


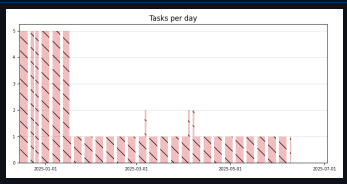
Pafnucy 4 tasks per day

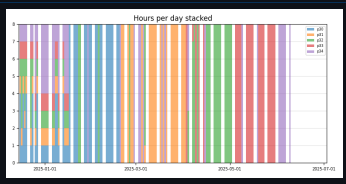




Romuald 5 tasks per day







Solver output at 03 January 2025, 17:50:55 PM

```
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>: fastmip 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 12538 variables (6855 bin, 6400 int, 0 impl, 75 cont) and 12358 constraints
  12358 constraints of type <linear>


original problem has 33015 active (0.020995%) nonzeros and 33015 (0.020995%) check nonzeros

presolving:
(round 1, fast)       5196 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 0 upgd conss, 0 impls, 0 clqs
(round 2, fast)       10316 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 0 upgd conss, 0 impls, 0 clqs
(round 3, exhaustive) 10316 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 1695 upgd conss, 0 impls, 0 clqs
(round 4, exhaustive) 10316 del vars, 10315 del conss, 0 add conss, 15 chg bounds, 0 chg sides, 0 chg coeffs, 1995 upgd conss, 993 impls, 0 clqs
   (0.1s) probing: 100/935 (10.7%) - 0 fixings, 0 aggregations, 167 implications, 0 bound changes
   (0.1s) probing: 200/935 (21.4%) - 0 fixings, 0 aggregations, 365 implications, 0 bound changes
   (0.1s) probing: 300/935 (32.1%) - 0 fixings, 0 aggregations, 546 implications, 0 bound changes
   (0.1s) probing: 400/935 (42.8%) - 0 fixings, 0 aggregations, 729 implications, 0 bound changes
   (0.1s) probing: 500/935 (53.5%) - 0 fixings, 0 aggregations, 905 implications, 0 bound changes
   (0.1s) probing: 600/935 (64.2%) - 0 fixings, 0 aggregations, 1123 implications, 0 bound changes
   (0.1s) probing: 700/935 (74.9%) - 0 fixings, 0 aggregations, 1292 implications, 0 bound changes
   (0.1s) probing: 800/935 (85.6%) - 0 fixings, 0 aggregations, 1469 implications, 0 bound changes
   (0.1s) probing: 900/935 (96.3%) - 0 fixings, 0 aggregations, 1681 implications, 0 bound changes
   (0.1s) probing cycle finished: starting next cycle
   (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 1 undirected components at node 1, depth 0 (0)
clique table cleanup detected 0 bound changes

presolved problem has 4181 active (0.188968%) nonzeros and 4181 (0.188968%) check nonzeros

presolving (5 rounds: 5 fast, 3 medium, 3 exhaustive):
 10853 deleted vars, 10852 deleted constraints, 0 added constraints, 15 tightened bounds, 0 added holes, 0 changed sides, 0 changed coefficients
 3788 implications, 0 cliques
presolved problem has 1477 variables (635 bin, 842 int, 0 impl, 0 cont) and 1498 constraints
   1313 constraints of type <varbound>
    185 constraints of type <linear>
Presolving Time: 0.12

 time | node  | left  |LP iter|LP it|n|mem|heur|mdpt |vars |conss|rows |cuts |sepa|confs|strbr|  dualbound   |  primalbound  |  gap   | compl.
p 0.2s|     1 |     0 |     0 |     0 |     - | vbounds|   0 |1477 |1498 |1498 |   0 |   0 |   0 |   0 | 5.017065e+03 | 1.232383e+04 | 145.64% | unknown
  0.2s|     1 |     0 |     0 |   806 |     - |    STM |   0 |1477 |1498 |1498 |   0 |   0 |   0 |   0 | 1.181620e+04 | 1.232383e+04 |   4.30% | unknown
  0.2s|     1 |     0 |   104 |     - |     - |    STM |   0 |1477 |1498 |1509 |   6 |   1 |   0 |   0 | 1.181620e+04 | 1.232383e+04 |   4.30% | unknown
  0.2s|     1 |     0 |   908 |     - |     - |    SDM |   0 |1477 |1498 |1506 |   8 |   2 |   0 |   0 | 1.181620e+04 | 1.232383e+04 |   4.30% | unknown
r 0.2s|     1 |     0 |   908 |     - |randrou|   0 |1477 |1498 |1506 |   0 |   2 |   0 |   0 | 1.181620e+04 | 1.181620e+04 |   0.00% | unknown
  0.2s|     1 |     0 |   908 |     - |    SDM |   0 |1477 |1498 |1506 |   8 |   2 |   0 |   0 | 1.181620e+04 | 1.181620e+04 |   0.00% | unknown

SCIP Status        : problem is solved [optimal solution found]
Solving Time (sec) : 0.20
Solving Nodes      : 1
Primal Bound       : +1.18162013478445e+04 (2 solutions)
Dual Bound         : +1.18162013478445e+04
Gap                : 0.00 %
WARNING: No dual information available when presolving was performed.
SCIP 9.0.1: optimal solution; objective 11810.20135
908 simplex iterations
1 branching nodes
```

Load a Excel data file

Excel file required in format 'xlsx'

Drag and drop file here

Limit 200MB per file

Browse files

02-many-tasks.xlsx 24.6KB

See the Yumbo's GitHub repository for sample Excel input files.

Today: 2024-12-15

Hours per day: 8

Customise report

Expert	Show?	Stacked?	Gantt?	Table?	Workloa
Alojzy	☑	☑	☑	☐	☐
Eugeniusz	☑	☑	☑	☐	☐
Ignacy	☑	☑	☑	☐	☐
Pafnucy	☑	☑	☑	☐	☐
Romuald	☑	☑	☑	☐	☐

Tasks definition

Name	Start day	End day	Work	Days	Workdays	Avg
p1	2024-12-16	2025-04-02	400	108	77	5.19
p5	2024-12-16	2025-03-02	200	77	54	3.70
p6	2024-12-16	2025-04-02	200	108	77	2.60
p13	2024-12-16	2025-03-02	200	77	54	3.70
p14	2024-12-16	2025-04-02	200	108	77	2.60
p15	2024-12-16	2025-05-02	200	138	99	2.02
p20	2024-12-16	2025-03-02	200	77	54	3.70
p21	2024-12-16	2025-04-02	200	108	77	2.60
p22	2024-12-16	2025-05-02	200	138	99	2.02
p23	2024-12-16	2025-06-02	200	169	120	1.67

Experts names

Name	Comment
Alojzy	1 task per day
Eugeniusz	2 tasks per day
Ignacy	3 tasks per day
Pafnucy	4 tasks per day
Romuald	5 tasks per day

Links

Expert	Task
Alojzy	p1
Eugeniusz	p5
Eugeniusz	p6
Ignacy	p13
Ignacy	p14
Ignacy	p15
Pafnucy	p20
Pafnucy	p21
Pafnucy	p22
Pafnucy	p23

Bounds xbday

Expert	Task	Start day	End day	Lower	Upper

empty

Bounds xbsum

Expert	Task	Start day	End day	Lower	Upper

empty

Bounds ubday

Expert	Start day	End day	Lower	Upper
Alojzy	2024-12-16	2025-01-16	1	1
Eugeniusz	2024-12-16	2025-01-16	2	2
Ignacy	2024-12-16	2025-01-16	3	3
Pafnucy	2024-12-16	2025-01-16	4	4
Romuald	2024-12-16	2025-01-16	5	5

Bounds ubsum

Expert	Task	Start day	End day	Lower	Upper

empty

Expert bounds and preferences

Expert	Start day	End day	Lower	Upper

empty

Invoicing periods

Name	Start day	End day	Days	Workdays
25.Jan	2024-12-11	2025-01-15	36	25
25.Feb	2025-01-16	2025-02-13	29	21
25.Mar	2025-02-14	2025-03-16	31	21
25.Apr	2025-03-17	2025-04-14	29	21
25.May	2025-04-15	2025-05-18	34	24

Invoicing periods bounds

Expert	Period	Lower	Upper

empty