



305construction

Backhoes and Scheduling

binary name: 305construction
repository name: 305construction
repository rights: ramassage-tek
language: C, C++, perl 5, python 3 (≥ 3.5), ruby 2 (≥ 2.2), php 5.6, bash 4
group size: 1-2
compilation: via Makefile, including re, clean and fclean rules



- Your repository must contain the totality of your source files, but no useless files (binary, temp files, obj files,...).
- All the bonus files (including a potential specific Makefile) should be in a directory named *bonus*.
- Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).

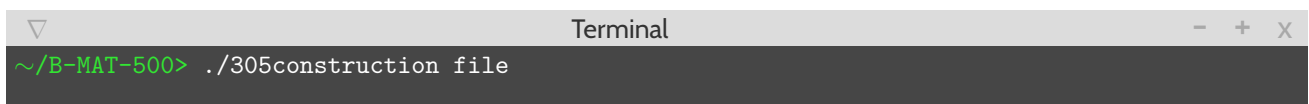
Subject

In the construction industry, the foreman is the person who manages, among other things, the scheduling of a construction site, and who also plans when contractors will intervene (which can be frequently). In order to do this, they have software that uses all the methods of operational research.

You must create a project's software that helps organize construction, based on the MPM method: starting from a file that describes all of the project's tasks, you will display the following:

- total duration of construction,
- the earliest and latest dates for each task,
- a Gantt diagram that specifies intervals of fluctuation.

Prototyping



file describe all of the tasks. Each line represents a task, and contains 4 separate pieces of information that are separated by semicolons, in the following order:

- the task's code,
- the description of the task,
- the duration of the task,



- the list of the task's prerequisites (they are also separated by semicolons).

Bonus

- a graphical display,
- other functionalities,

Examples

```
Terminal
~/B-MAT-500> cat house.csv
Car;carpenter;4;Fou
Hea;heat;3;Ele;Mas
Cov;cover;2;Car
Ele;electricity;1;Cov;Mas
Fin;finishing touches;9;Cov;Ele;Mas;Plu
Fou;foundations;8;Lan
Mas;masonry;4;Lan;Fou
Plu;plumbing;1;Ele;Mas
Lan;landscaping;3
```

```

Terminal
~/B-MAT-500> ./305construction house.csv
total duration of construction: 28 weeks

Lan must begin at t=0
Fou must begin at t=3
Car must begin at t=11
Mas must begin between t=11 and t=13
Cov must begin at t=15
Ele must begin at t=17
Plu must begin at t=18
Hea must begin between t=18 and t=25
Fin must begin at t=19

Lan      (0)      ===
Fou      (0)      =====
Car      (0)      =====
Mas      (2)      =====
Cov      (0)      ==
Ele      (0)      =
Plu      (0)      =
Hea      (7)      ===
Fin      (0)      =====

```



The tasks and the intervals of fluctuation are separated by a tab (not a space).
Same for the intervals of fluctuation and the schedule.



The Gantt diagram doesn't contain spaces after the tasks, nor between the '='.