



305construction

binary name: 305construction
language: everything working on "the dump"
compilation: when necessary, via Makefile, including re, clean and fclean rules



- The totality of your source files, except all useless files (binary, temp files, obj files,...), must be included in your delivery.
- 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).

In the construction industry, the foreman is the person who manages, among other things, the scheduling of a construction site, and plans when contractors are intervening (which can be frequently). In order to do this, he uses software to automate the scheduling.

You must create a project management software that helps organize construction, based on the MPM method. Starting from a file that describes all of the project tasks, you have to display the following:

- Total duration of construction,
- The earliest and latest start dates for each task,
- A Gantt chart that specifies intervals of fluctuation.



In the Gantt chart, tasks are ordered first by earliest start date, then by duration and finally by id.



USAGE

```
Terminal
~/B-MAT-500> ./305construction -h
USAGE
  ./305construction file

DESCRIPTION
  file      file describing the tasks
```

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

- The task id,
- The description of the task,
- The duration of the task,
- The list of the task prerequisites (also separated by semicolons).

SUGGESTED BONUSES

- A graphical display,
- Additional constraints.

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 chart doesn't contain spaces after the tasks, nor between the '='.