2003/2004 SOUTHERN CALIFORNIA REGIONAL
ACM INTERNATIONAL COLLEGIATE PROGRAMMING CONTEST

Problem 6
Turnaround Time Metrics

The buzzword for product offering organizations today is turnaround time! The product can be either a service, such as responding to a customer repair request, or goods, such as shipping books ordered online. Your team has been hired by a quality rating firm to assess the performance of companies that log their turnaround time. Turnaround time is measured in working days. It is expected that unless specified in the input, weekends (Saturdays and Sundays) are not considered working days.

Input is a multipart specification that contains all the information necessary to produce turnaround reports. Each section is separated by a line that has a pound sign '#' in column one. The first section contains a list of unique product numbers versus the expected turnaround time in days. Product numbers are positive integers in the range 1..100. There will never be more than 100 products. Whitespace separates the product number from the turnaround time.

The second section contains zero or more exceptional dates. If a line with an exceptional date begins with a plus sign '+' in column 1, the date specified is to be considered a workday; if the line begins with a minus sign '-' in column 1, the date is not a workday (such as a holiday). A single space separates the plus or minus sign from the exceptional date. Any particular exceptional date is specified only once.

The third section contains the log of completed jobs. Each line in this section has three elements, separated by whitespace. The first element is the product number. The second and third elements are the start and end dates, respectively, for the job. Start and end dates will always fall within the years 1990..2010. Start and end dates always occur on workdays. If a product is turned around the same day that it is started, then it is measured as taking zero days. The input will never contain more than 250 log entries.

The fourth and final section is a list of reporting date ranges. Each line in the final section has two dates, start and end, separated by whitespace. You are to report summary information for any jobs that *started* within the specified date range. The final section is terminated by end-of-file.

Output is a summary report, one line per reporting date range. Print the date range with a dash between start and end date. Then for jobs that started within that range, print a space, the number of delinquent jobs (those that exceeded the expected turnaround time) right justified in 3 characters, a space, and the on-time percentage (the percentage of jobs that were completed within the expected turnaround time). Print the percentage as three characters before the decimal point, a decimal point, and one digit after the decimal point. For the characters preceding the decimal point, pad with leading spaces when the percentage is less than 100.0. (For example, zero percent would print with two leading spaces as " **`0.0`**") Follow the numeric percentage with a percent sign. When there are no jobs that started within the reporting date range, print only the date range. See the *Output for the Sample Input* as a formatting example.

Dates are of the form **`YYYYMMDD`**, where **`YYYY`** is a four-digit year, **`MM`** is the month, 01..12, and **`DD`** is the day of the month, 01..31. Years will be in the range 1990..2010. January 1, 1990 is a Monday.

Hint: you may execute the Unix **`cal`** *command to view the calendar for a particular year. E.g.*

```
cal 2003
```

Problem 6
Turnaround Time Metrics (continued)

Sample Input

```
10 5
 2 3
# end of product definitions
- 20020101
- 20030101
- 20020704
+ 20020706
- 20030704
# end of exceptional dates
10 20020703 20020710
  2 20021230 20030103
 2 20020706 20020711
# end of job log
20020701 20020731
20001226 20001231
20021229 20030104
```

Output for the Sample Input

```
20020701-20020731   1  50.0%
20001226-20001231
20021229-20030104   0 100.0%
```