Trabalho prático de Introdução à Computação, ano 2003-2004

What a nice day, isn't it?!

There exist various calendars in the world. In fact, making calendars is probably as old as the human race. As old as calendars are the problems associated with making them. The most common problem is that the length of a year, the time it takes the earth to complete an entire orbit, is not a whole number of days, the time it takes the earth to spin around its axis. Instead it takes approximately 365.242190 days. In our modern calendar used in the western world, this problem is circumvented by introducing so-called leap years. By lengthening every fourth year by one day, on the average a year takes 365.25 days. Without doing this the year would rapidly be out of phase with the seasons. If we'd define every year to be exactly 365 days, after 754 years, the seasons would be half a year out of phase and 1st of January would be in the middle of summer! Julius Caesar, in 45 B.C., introduced the Julian calendar, which states that

- Every year divisible by 4 is a leap year.

Although the quarterly leap years improve things, they do not solve all the problems, since 365.25 days is not the same as 365.242190 days. That is why it was decided by decree of Pope Gregory XIII on 24 February 1582 that

- Every year divisible by 4 is a leap year.
- However, every year divisible by 100 is *not* a leap year.
- However, every year divisible by 400 *is* a leap year.

This makes the year on average 365+1/4−1/100+1/400 = 365.2425 days long; accurate enough. To recapture synchronization of the calendar with the seasons, when the Gregorian calendar was introduced (4 October 1582 in Portugal), 10 days were skipped; thus 4 October 1582 was followed by 15 October 1582. Interesting fact: in some Eastern countries, the church still uses the old calendar, without the skip of ten days and thus, for example, Christmas is celebrated in the beginning of January in these countries and the Russian October Revolution was actually in November!

Write a program that determines what day of the week a given date was.

For example: 12 April 2004 was a Monday.
The program should know which calendar to use (Julian or Gregorian) and should signal when a date does not exist, for example 8 October 1582 does not exist.

⇓ What day of the week was the battle of Waterloo (18 June 1815)?

Extend the program so that it shows how many days have passed since a given day.

Extend the program so that it shows a calendar of the month containing the given day.

- Use PASCAL for the program. Hand in your work on a floppy 1.4 MB.
- Work in groups of two people.
- Deadline: 14 June 2004.
- Counts for 20% of final note (together with 80% of exam).
- Who has more than or equal to 14 has to come and talk to a docent.
- Without handing in the work, you will not be admitted to the exam. As a reminder, students admitted to the exam will be those that have a score 10 or higher for the practical work and frequented the practical lectures.
- **Students who copy or let their work be copied will not be admitted to the exam.**