

# Scheduling Nurses

## Problem description

Mr. Schedule has been asked to organize the schedule of nurses for the Cardiology service at St. Joseph's hospital. A working day in this service is subdivided into twelve periods of two hours. The personnel requirement changes from period to period: for instance, only a few nurses are required during the night, but the total number must be relatively high during the morning to provide specific care to the patients. The following table lists the personnel requirement for every time period.

**Question 1:** Determine the minimum number of nurses required to cover all the requirements, knowing that a nurse works eight hours per day and that she is entitled to a break of two hours after she has worked for four hours.

**Question 2:** The service only has 80 nurses, which is not sufficient with the given requirements. Mr. Schedule therefore proposes that part of the personnel works two additional hours per day. These two additional hours follow immediately after the last four hours, without any break. Determine the schedule of the nurses in this service that minimizes the number of nurses working overtime.

Number	Time interval	Minimum number of nurses
0	00am - 02am	15
1	02am - 04am	15
2	04am - 06am	15
3	06am - 08am	35
4	08am - 10am	40
5	10am - 12pm	40
6	12pm - 02pm	40
7	02pm - 04pm	30
8	04pm - 06pm	31
9	06pm - 08pm	35
10	08pm - 10pm	30
11	10pm - 12am	20

*Table 1 Personnel requirement per time period*