

Project E

We want to build a skyscraper in the historic center of Padua. The workers who build the steel structures of skyscrapers are highly specialized, therefore difficult to find. The table below shows the requests for workers on site in a six-month period. Transfers from other construction sites in Padua are only possible on the first of each month and cost 100 euros per worker. At the end of each month, workers can go to other sites for 160 euros. Over/understaffing costs 200 euros per month per person (in case of lack of staff, the missing hours must be covered through the overtime of the available workers).

| March | April | May | June | July | August |
|-------|-------|-----|------|------|--------|
| 4 | 6 | 7 | 4 | 6 | 2 |

Overtime must be limited to 25% of the total hours worked. Every month, at most three workers can arrive at the construction site. The departure of workers to other construction sites is limited, due to the agreements with the trade unions, to one third of the total staff employed in the month. Suppose that 3 workers are already present on site at the end of February, that no one is transferred at the end of February and that 3 workers remain on site at the end of August. What is the number of departures and arrivals that minimizes the total cost?