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# THE JAVA PROGRAMMING LANGUAGE

## PLAYGROUNDS IN A CITY PARK

University of Wrocław  
Institute of Computer Science

Paweł Rzechonek

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### Exercise

Consider a city park with paths in the form of lattice. In the park there are several playgrounds for children, located at the intersections of alleys. In this park there is also a lot of parents with their children. They walk the alleys and look for the playground to their child could play for a while. If in encountered playground exists free space, then the parent with the child stays there for a long time. If there is no free space, the parent waits for a short moment — if during this time free space appears, then the parent with children occupies it and stays there for a long time, and if not, goes further.

Write an application which will illustrate the city park and the behavior of its guests. We can assume that in the park are  $w$  lanes from the north to the south and  $h$  lanes from the east to the west.  $n$  parents with their children walk through the park, where  $n > w + h$ . Define each parent with child as a thread. Each playground for children should be a shared resource with a given capacity. There are  $k$  playgrounds for children, where  $k \sim \frac{w+h}{2}$ . Each of the playground has a given capacity  $c_0, c_1, \dots, c_{k-1}$ , where  $\sum_{i=0}^{k-1} c_i < n$ .

Your application should generate a simple drawing of the park with playgrounds and parents walking through the park with their children. Refresh this drawing every  $\frac{1}{20}$  second — use for this purpose an object `javax.swing.Timer` (*Swing* timer fires one or more action events after a specified delay).

### Requirement

Create, build, and run your application in *NetBeans* environment.