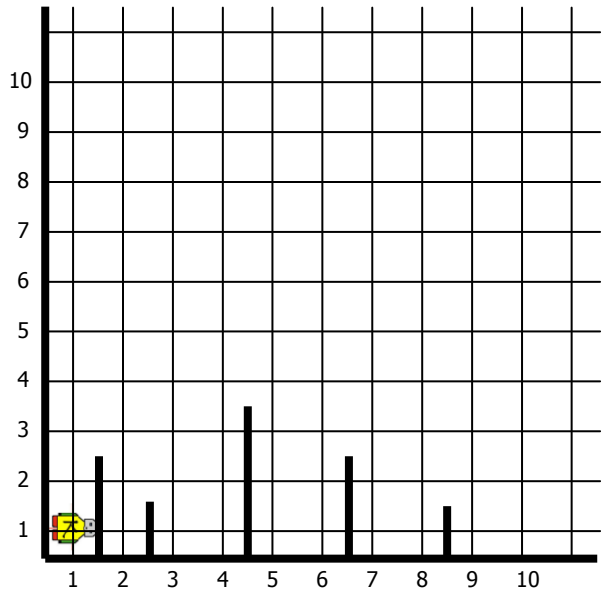
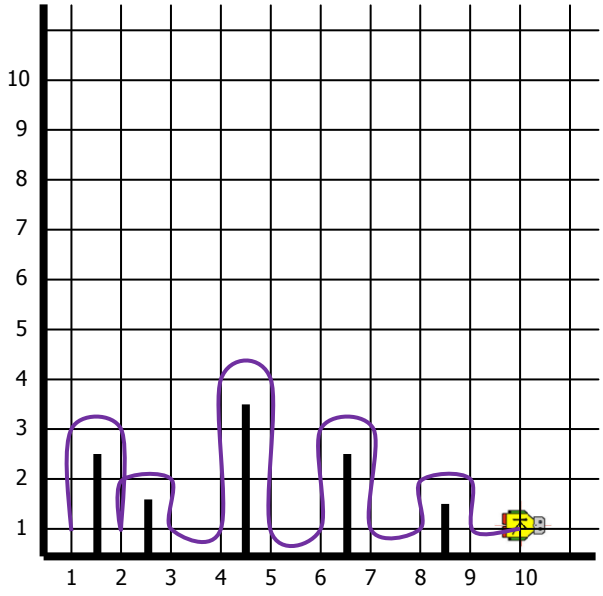
AP Computer Science
Karel Chapter 5 Programs

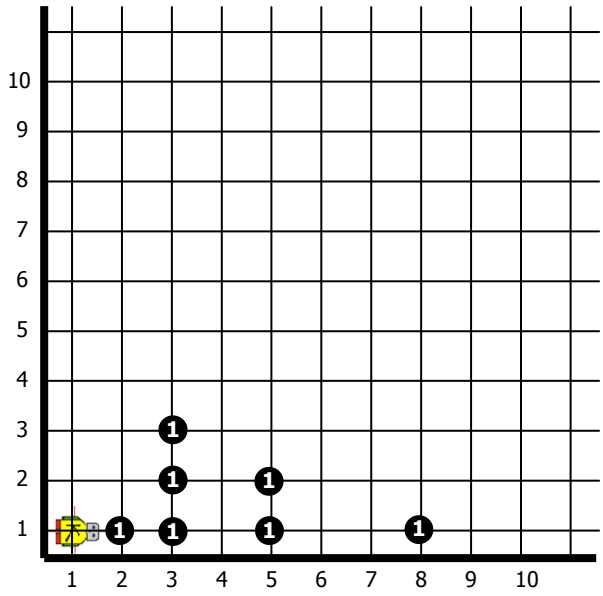
Name: _____
Date: _____ Period: _____

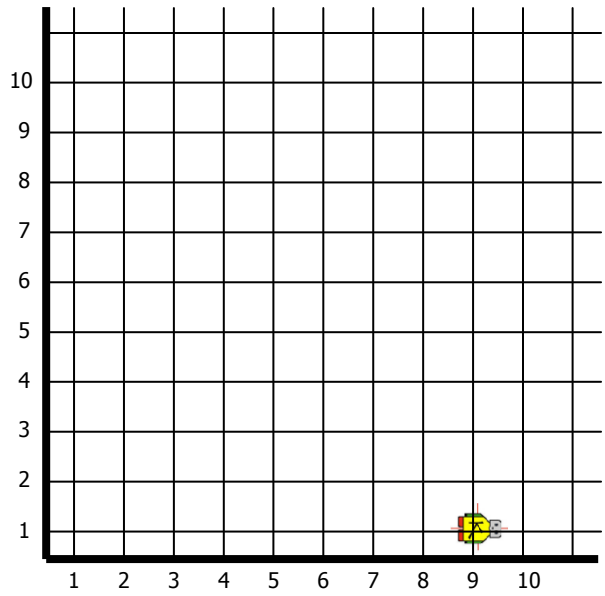
1. Program a robot to run a mile long steeplechase. The steeplechase course is similar to the hurdle race, but here the barriers can be one, two, or three blocks high. The figure below shows one sample initial situation where the robot's final situation and path are shown. Call the class of this new robot `Steeplechaser`. It should have `Hurdler` as a parent class. Override appropriate instructions of `Hurdler` to implement the new behavior.



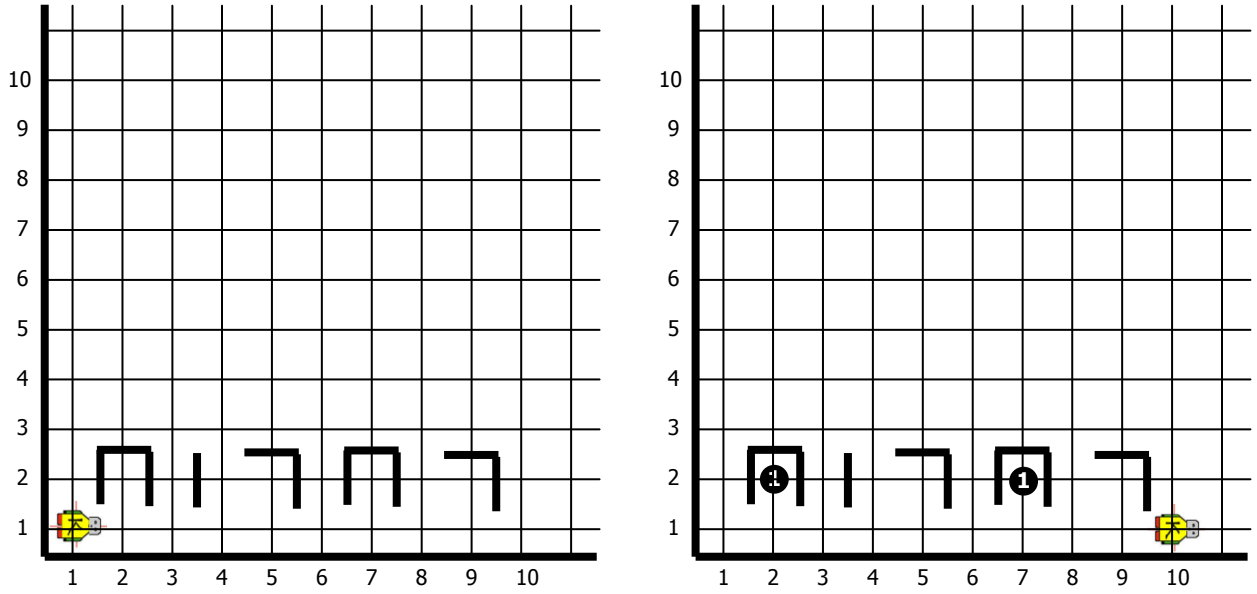


2. Program a robot to run a mile-long steeplechase where the steeples are made from beepers instead of wall segments. The robot must jump the steeples in this race by picking the beepers that make up the steeples. Each steeple is made from beepers that are positioned in columns that are one, two, or three blocks long. Corners have either zero or one beeper. There are no gaps in any of the steeples. The figure below shows one sample initial situation.





3. A robot named karel has been hired to carpet some "small rooms" along a one mile section of its world. A "small room" is a corner that has a wall segment immediately to the west, north, and east. The door is to the south. Karel is to put a single beeper in only the "small rooms" and on no other corners. The figure below shows one set of initial and final situations. You may assume that karel has exactly eight beepers in its beeper-bag.



4. Karel has been hired for a complex carpeting task. The area to be carpeted is one mile long. The rooms are now one, two, or three blocks long. The room must have continuous walls on its west and east side and at its northern end. If any walls are missing, the area must not be carpeted. Also, karel must not reuse beepers. This means that once a beeper has been put down, it must not be picked up. The figure below shows one set of initial and final situations. You give karel exactly twenty-four beepers during construction and delivery.