

2. (30 points) WPI has decided to automate housing selection. Rather than having students gather in person to select rooms, students will submit a function that takes the number of rooms available in each dorm and returns the name of the dorm they want a room in. For this problem, we'll assume all rooms are doubles in Morgan and Daniels.

A housing request consists of the names of two students (to share a double) and a function that takes two numbers (the number of rooms available in Morgan and Daniels) and returns either 'morgan or 'daniels. The following data definition captures a housing request:

A room-request is a
(make-request symbol symbol (number number -> symbol))
(define-struct request (student1 student2 choose))

A dorm assignment lists two students and the dorm in which they will live. Here is the data definition for a room assignment:

A dorm-asgmt is a
(make-asgmt symbol symbol symbol)
(define-struct asgmt (student1 student2 dorm))

- (a) (10 points) Beavis and Butthead would choose a room in Daniels if there were at least two rooms open there (so their friends, drawing right after them, could also live there); otherwise, they'll take Morgan. Write the *make-request* example that captures this request.

- (b) (20 points) Write a program *draw-rooms* that consumes two numbers (the available rooms in Morgan and Daniels, respectively) and a list of requests and returns a list of dorm assignments. The program should process the requests in order and return the list of resulting dorm assignments. Processing a request should decrease the number of available rooms in the appropriate dorm. Assume there are enough rooms that every request will yield either 'morgan or 'daniels.

For example, if *BB-request* refers to your answer from part (a) (and assuming the same request were processed twice):

```
(draw-rooms 9 1 (list BB-request))  
= (list (make-asgmt 'Beavis 'Butthead 'morgan)  
  
(draw-rooms 9 2 (list BB-request BB-request))  
= (list (make-asgmt 'Beavis 'Butthead 'daniels)  
        (make-asgmt 'Beavis 'Butthead 'morgan))
```