A7 Notes

**New Functions:**

loadProbs: Returns the probability table I generated. Includes counts of how many times an (s,a,s') instance was sampled from the simulator. This probability table was generated by running the simulator using the environment described on page 2.

writeProbs: takes a probability table as input, and writes it to a file – Used this to generate loadProbs. Could just save the variable using matlab, but I wanted to be able to order it for better readability so I wrote this.

tprob: Reads in a file list (s,a,s') instances and returns a table of S,A counts, and a probability table from the file. Note, it includes the actions of P_WAIT, and P_WRAP_UP in the action set. To eliminate those actions from the data set simply run Pr = Pr(1:8,2:5) on the returned probability table.

logTransition: takes s,a,s' as an input and writes them to a file. The file it writes to is stored in a persistent variable and is changed by passing a fourth argument to the function, fname. If the argument fname is given, it updates the persistent variable, and doesn't write it to a file. This allows all calls to not require passing around a file name, but allows the file name to be easily changed if desired. Defaults to "tr.txt".

getstate: takes the value of nominal, rain, and wind, and returns the corresponding state integer.

**Files modified:**

CS6380_A7_ABMS: Now passes wind and rain as part of percept. Didn't change how it applies the wind/rain other than removing the intensity/2 and changing the rain intensity to .25 instead of .5.

CS6380_load_rain/wind_data: Modified stored variable structure for new model. Added more wind/rain to get a better distribution of states.

CS6380_rain/wind: incorporated updated wind/rain model, and added a return value to tell the simulator whether the position is affected by wind/rain. I'm sure there is still room for improvement here.

UAS_template/CS6380_UAS_tom_100-109: added variables to track the previous plan and state. Added random selection of plans. Added call to logTransition with s,a,s'.

**Data in results folder:**

tr.txt: The set of observed s,a,s' pairs, each line is an observation. Used to generate the probability table.

movie.mat: the movie returned by the simulation saved as matlab .mat file

r1.mat: the res returned by the simulation saved as matlab .mat file

loadProbs.m: the same file as above, returns the probability table. File is formatted for readability.

**Environment**

Ran for 100 seconds

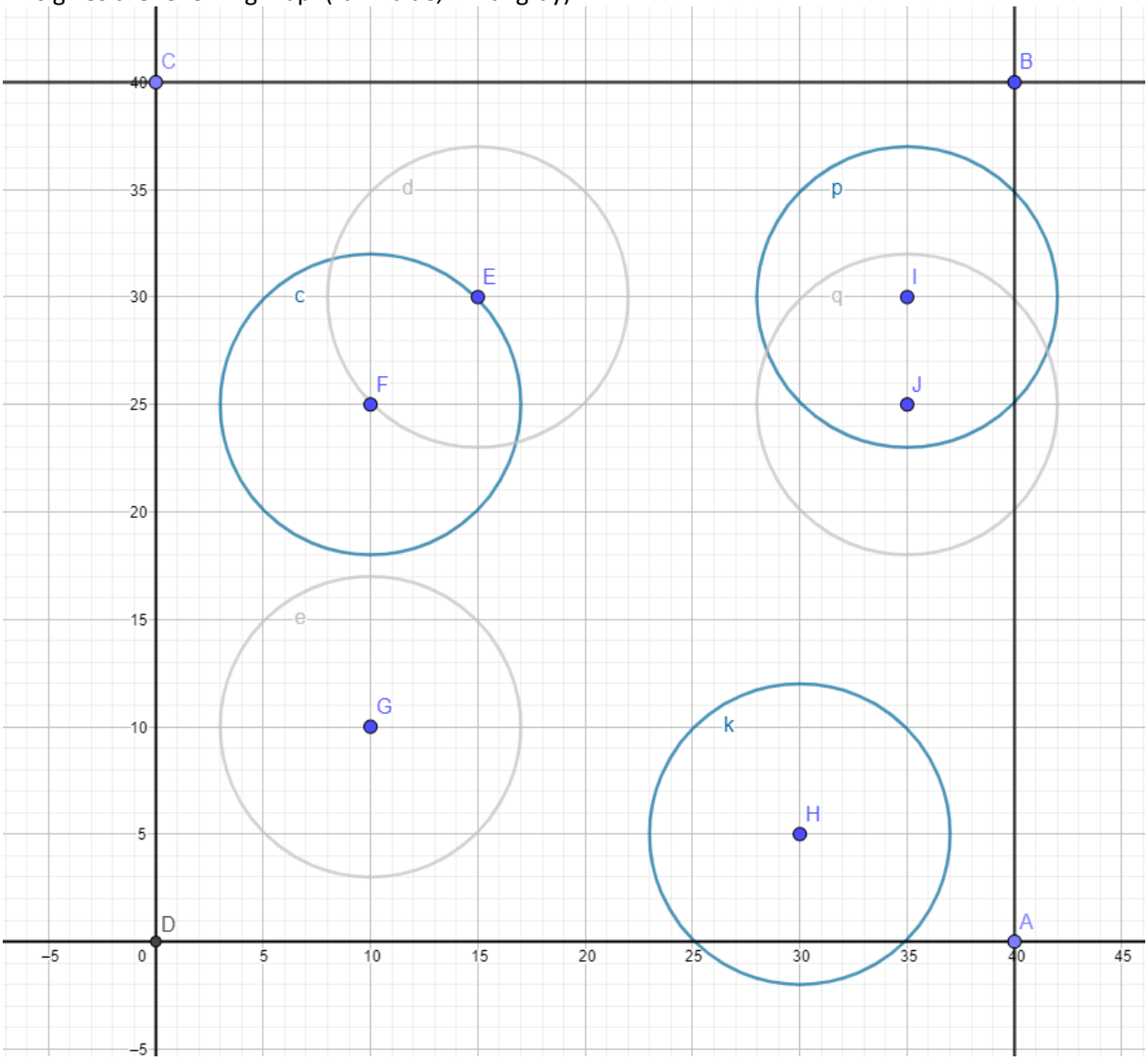
Wind Data: [x,y,h,r, magnitude, direction (CW(0)/CCW(1))]

```
centers = [10 10 0 7 2 1;...
           15 30 0 7 2 0;...
           35 25 0 7 2 0];
```

Rain data: [x y z r h theta]

```
centers = [10 25 0 7 0.25 pi/4;...
           35 30 0 7 0.25 pi/4;...
           30 5 0 7 0.25 pi/4];
```

Actions were selected randomly excluding P_wait and P_wrapup
This gives the following map: (rain: blue, wind: gray)



```
% States:
%   1: ~N, ~R, ~W
%   2: ~N, ~R,  W
%   3: ~N,  R, ~W
%   4: ~N,  R,  W
%   5:  N, ~R, ~W
%   6:  N, ~R,  W
%   7:  N,  R, ~W
%   8:  N,  R,  W
%
%   Actions
%   1: P_GO_TO_LANE
%   2: P_CORRECT_HEADING
%   3: P_CORRECT_SPEED
%   4: P_FOLLOW_LANE
```