```
%function [] = economy_TEAM(floor_plan)
floorplan = importdata("floor_plan_3.floor");

%==========================================================================
%INITIALIZATION OF VARIABLES
  %initial robot coordinates set
  roombaX = 2;
  roombaY = 2;
  %initial move direction is set (0 = does not move)
  movedir = 0;
  %coordinates of the charging pad
  chargeX = 2;
  chargeY = 2;
  %create copy of floorplan to track where the robot has been (marked as 5)
  clean_map = floorplan;
  %variable set to 1 when direction needs to be changed
  switch_dir = 0;
  %variable set to 1 when charge is needed
  need_charge = 0;
  %i represents the battery life, the robot moves one tile per loop

% change below to just check for 3's with "high-end" model
while ismember(3, clean_map) == 1 || ismember(4, clean_map) == 1

%==========================================================================
%FIND NEXT UNCLEAN LOCATION - starts path from current position

  for i = 1:250 %change to 350 for "regular" model
        %find next tile to be cleaned if not returning to charger
        if need_charge == 0
            %change below to [k,m] = find(clean_map == 3,1); for "high-end"
            %model
            [k,m] = find(clean_map < 5 & clean_map > 2,1);
        end

%==========================================================================
%MOVEMENT - moves the robot by setting previous tile to white and
%setting current tile red.
       switch movedir
           case 1 % up
               roombaY = roombaY - 1;
               floorplan(roombaY + 1, roombaX) = 4;
               clean_map(roombaY + 1, roombaX) = 5;
               floorplan(roombaY, roombaX) = 2;
           case 2 % right
```

```
               roombaX = roombaX + 1;
               floorplan(roombaY, roombaX - 1) = 4;
               clean_map(roombaY, roombaX - 1) = 5;
               floorplan(roombaY, roombaX) = 2;
           case 3 % down
               roombaY = roombaY + 1;
               floorplan(roombaY - 1, roombaX) = 4;
               clean_map(roombaY - 1, roombaX) = 5;
               floorplan(roombaY, roombaX) = 2;
           case 4 % left
               roombaX = roombaX - 1;
               floorplan(roombaY, roombaX + 1) = 4;
               clean_map(roombaY, roombaX + 1) = 5;
               floorplan(roombaY, roombaX) = 2;
           otherwise
       end

%=========================================================================
%MOVEMENT DIRECTIONS - declares what movement the robot will have
%next loop

       %time between each movement in seconds
       pause(.005);

       %makes tile charging pad tile become blue whenever robot is off of
it
       if chargeX ~= roombaX || chargeY ~= roombaY
       floorplan(chargeY, chargeX) = 5;
       end

       %displays the new floorplan before next move is determined
       dispfloor(floorplan);

       %function used to find next direction of movement
       [movedir, switch_dir, clean_map] = nextdir(k, m, roombaX, roombaY,
movedir, switch_dir, floorplan, clean_map, need_charge);


  end

%=======================================================================
%RETURN TO CHARGE
   %returns to charging pad
   movedir = 0;
   k = chargeY;
   m = chargeX;
   need_charge = 1;
   %find route and travel back to charge station
   while need_charge == 1
       [movedir, switch_dir, clean_map, need_charge] = nextdir(k, m,
roombaX, roombaY, movedir, switch_dir, floorplan, clean_map, need_charge);
       switch movedir
           case 1 % up
               roombaY = roombaY - 1;
               floorplan(roombaY + 1, roombaX) = 4;
               floorplan(roombaY, roombaX) = 2;
           case 2 % right
               roombaX = roombaX + 1;
               floorplan(roombaY, roombaX - 1) = 4;
               floorplan(roombaY, roombaX) = 2;
           case 3 % down
               roombaY = roombaY + 1;
               floorplan(roombaY - 1, roombaX) = 4;
               floorplan(roombaY, roombaX) = 2;
           case 4 % left
               roombaX = roombaX - 1;
               floorplan(roombaY, roombaX + 1) = 4;
               floorplan(roombaY, roombaX) = 2;
           otherwise
       end
       %time between each movement in seconds
       pause(.005);
       %displays the new floorplan
       dispfloor(floorplan);
   end
end
```