function [movedir, switch\_dir, clean\_map, need\_charge] = nextdir(k, m, roombaX, roombaY, movedir, switch\_dir, floorplan, clean\_map, need\_charge)

%if in desired position to clean mark as cleaned or reset charge

if roombaX == m && roombaY == k

movedir = 0;

if need\_charge == 1;

need\_charge = 0;

else

clean\_map(roombaY, roombaX) = 5;

end

%-----------------------------------------------------RIGHT MOVEMENT----------------------------------------------------

%move right if no obstacle

elseif roombaX < m && floorplan(roombaY, roombaX + 1) > 2

movedir = 2;

if switch\_dir == 1

switch\_dir = 0;

end

%move up if no obstacle is up and right is obstacle

elseif roombaX < m && switch\_dir == 0

if floorplan(roombaY - 1, roombaX) > 2

movedir = 1;

else

switch\_dir = 1;

movedir = 0;

end

%move down if obstacle up and right (switch directions)

elseif roombaX < m && floorplan(roombaY + 1, roombaX) > 2 && switch\_dir == 1

movedir = 3;

%move left if up, down, and right have obstacles

elseif roombaX < m && roombaY >= k && floorplan(roombaY - 1, roombaX) < 3 && floorplan(roombaY, roombaX - 1) > 2

movedir = 4;

%------------------------------------------------------LEFT MOVEMENT-----------------------------------------------------

%move left if no obstacle

elseif roombaX > m && floorplan(roombaY, roombaX - 1) > 2 && movedir ~= 2

movedir = 4;

if switch\_dir == 2

switch\_dir = 0;

end

%move up if no obstacle is up and left is obstacle

elseif roombaX > m && switch\_dir == 0

if floorplan(roombaY - 1, roombaX) > 2

movedir = 1;

else

switch\_dir = 2;

movedir = 0;

end

%move down if obstacle up and left (switch directions)

elseif roombaX > m && floorplan(roombaY + 1, roombaX) > 2 && switch\_dir == 2

movedir = 3;

%move right if up, down, and left have obstacles

elseif roombaX > m && roombaY > k && floorplan(roombaY - 1, roombaX) < 3 && floorplan(roombaY, roombaX + 1) > 2

movedir = 2;

%--------------------------------------------------------UP MOVEMENT-------------------------------------------------------

%move up if no obstacle

elseif roombaY > k && floorplan(roombaY - 1, roombaX) > 2

movedir = 1;

if switch\_dir == 3

switch\_dir = 0;

end

%move right if no obstacle is right and up is obstacle

elseif roombaY > k && switch\_dir == 0

if floorplan(roombaY, roombaX + 1) > 2

movedir = 2;

else

switch\_dir = 3;

movedir = 0;

end

%move left if obstacle up and right (switch directions)

elseif roombaY > k && floorplan(roombaY, roombaX - 1) > 2 && switch\_dir == 3

movedir = 4;

%move down if up, right, and left have obstacles

elseif roombaY > k && roombaX > m && floorplan(roombaY, roombaX - 1) < 3 && floorplan(roombaY + 1, roombaX) > 2

movedir = 3;

%------------------------------------------------------DOWN MOVEMENT-----------------------------------------------------

%move down if no obstacle

elseif roombaY < k && floorplan(roombaY + 1, roombaX) > 2

movedir = 3;

if switch\_dir == 4

switch\_dir = 0;

end

%move right if no obstacle is right and down is obstacle

elseif roombaY < k && switch\_dir == 0

if floorplan(roombaY, roombaX + 1) > 2

movedir = 2;

else

switch\_dir = 4;

movedir = 0;

end

%move left if obstacle down and right (switch directions)

elseif roombaY < k && floorplan(roombaY, roombaX - 1) > 2 && switch\_dir == 4

movedir = 4;

%move up if down, right, and left have obstacles

elseif roombaY < k && roombaX > m && floorplan(roombaY, roombaX - 1) < 3 && floorplan(roombaY - 1, roombaX) > 2

movedir = 1;

end

end