**Sensehat Marble Code**

from sense\_hat import SenseHat

sense = SenseHat()

from time import sleep

#while True:

# pitch = sense.get\_orientation()['pitch']

# roll = sense.get\_orientation()['roll']

# print("pitch {0} roll {1}".format(round(pitch,0), round(roll,0)))

# sleep(0.05)

b = (0,0,0)

w = (255,255,255)

r = (255,0,0)

g = (0,255,0)

board = [[r,r,r,r,r,r,r,r],

[r,b,b,b,b,b,b,r],

[r,b,b,b,g,r,b,r],

[r,r,r,b,r,r,b,r],

[r,b,b,b,b,b,b,r],

[r,b,b,r,r,b,b,r],

[r,b,b,r,b,b,b,r],

[r,r,r,r,r,r,r,r] ]

y=2

x=2

board[y][x]=w

board\_1D=sum(board,[]) #convert to 1 dimensional list

sense.set\_pixels(board\_1D)

def move\_marble(pitch,roll,x,y):

new\_x = x #assume no change to start with

new\_y = y #assume no change to start with

if 1 < pitch < 179 and x != 0:

new\_x -= 1 # move left

elif 359 > pitch > 179 and x != 7:

new\_x += 1 # move right

if 1 < roll < 179 and y != 7:

new\_y += 1 # move up

elif 359 > roll > 179 and y != 0:

new\_y -= 1 # move down

new\_x,new\_y = check\_wall(x,y,new\_x,new\_y)

return new\_x, new\_y

def check\_wall(x,y,new\_x,new\_y):

if board[new\_y][new\_x] != r:

return new\_x, new\_y

elif board[new\_y][x] != r:

return x, new\_y

elif board[y][new\_x] != r:

return new\_x, y

return x,y

game\_over = False

while not game\_over:

pitch = sense.get\_orientation()['pitch']

roll = sense.get\_orientation()['roll']

board[y][x]= b

x,y = move\_marble(pitch,roll,x,y)

board[y][x] = w

sense.set\_pixels(sum(board,[]))

if board[2][4] != g:

sense.clear()

sense.show\_message("yay!!")

game\_over = True

sleep(0.05)

**BULLCOW Code**

import random

def gen\_4\_dif\_nums():

numList = [1,2,3,4,5,6,7,8,9,0]

return random.sample(numList,4)

def bulls\_and\_cows():

game\_answer = gen\_4\_dif\_nums()

print(game\_answer, "test only")

game\_over = False

attempts = 0

while not game\_over:

player\_input = input("Please input 4 digits: ")

attempts += 1

bulls = 0

cows = 0

player\_guess = [int(d) for d in str(player\_input)]

print (player\_guess)

for i in range(len(player\_guess)):

if player\_guess[i] == game\_answer[i]:

bulls += 1

elif player\_guess[i] in game\_answer:

cows += 1

if bulls == 4:

print("You win!")

print("Attempts: ", attempts)

game\_over = True

else:

print(bulls, " A (Bulls) ", cows, " B (Cows) ")

bulls\_and\_cows()