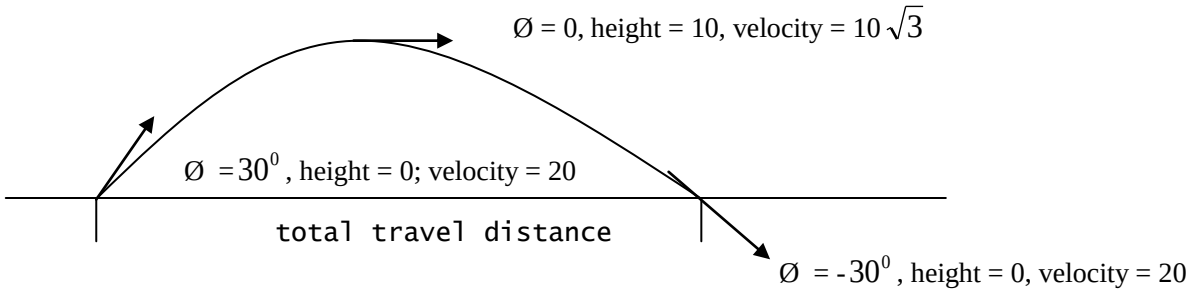
EECS 12 Assignment 2 (due 6pm, Oct. 12)
Fall 2013

In this assignment, you are to calculate the *parabolic trajectory* of a ball, given its initial velocity and its direction angle. We assume that the gravity is 10 m/s² and there is no resistance in the horizontal direction.

Parabolic Trajectory Example:



Basic Program Example:

```
def main():
    print("This program produces the parabolic trajectory of a ball.")
    velocity = eval(input("Enter the initial velocity from 100-200(m/s):"))
    angle = evel(input("Enter the initial angle, between 0 and 90:"))
    xVelocity = compute . . .
    yVelocity = compute . . .
    totalDistance = 0

    for each second from the time the ball is thrown to when the ball hits the ground:
        use chaos (seed = 0.5) to compute the wind resistance
        compute the current position, velocity, flight angle, etc.
        accumulate the total horizontal distance travelled so far
        print(the ball's position and flight angle)

    print("The total distance for the ball's flight is", totalDistance)
```

Requirements:

1. Modify the program pseudo code so that your program can determine the loop count (how many seconds before the ball hits the ground) based on the initial velocity and its angle.
2. Design the code inside the loop so that your program calculates ball velocity, flight angle and position at each second. Use the chaos formula to calculate a random wind resistance.
3. Calculate the totally traveled distance of the ball.
4. Print the ball position at each second, and the total distance at the end.

Grading Criteria (20 points):

- Correctly calculate ball position, flight angle at every second (10pt)
- Correctly calculate the totally travel length (5pt)
- Correctly print the whole table (5pt)
- Extra credit for taking the EEE survey (2pt)

Submission:

Submit your homework before **6pm, Oct. 12 (Saturday)** to the EEE Dropbox. Submit only the python source file, with file name "hw2.py".

Result Example:

This program calculates the height, velocity and velocity direction angle of Parabolic Trajectory of a ball
Enter the initial velocity, from 100 - 200 (m/s): 118
Enter the initial velocity angle, between 0 and 90: 30

Time	Angle	Px	Py
0	30.0	0	0.0
1	27.98151257967745	102.19099764656377	53.99999999999999
2	23.11891572982711	194.41837302258756	97.99999999999999
3	18.184242547487965	285.76901191144304	131.99999999999997
4	13.262753821862903	374.0548375756859	155.99999999999997
5	6.663089799062019	454.66452035866973	169.99999999999994
6	-0.822816343035182	531.7061516901682	173.99999999999994
7	-9.104547178932727	601.3351049335025	167.99999999999994
8	-17.807123622755995	669.9755165752372	151.99999999999994
9	-27.710207287061063	735.3549294336417	125.99999999999989
10	-35.06778598544423	794.3756783679642	89.99999999999989
11	-42.180274364699294	852.7825541849377	43.999999999999886

The ball totally travels: 898.825506159648