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# "maya/scripts/gen_coords.py"
# This script is responsible for creating lists
# of xyz coordinates.
import random
import math

def cubic(num, side):
    data = []
    for n in range(10):
        x = random.uniform(-side/2, side/2)
        y = random.uniform(-side/2, side/2)
        z = random.uniform(-side/2, side/2)
        data.append( (x, y, z) )
    return data

#-----
def spherical(num, outer_radius):
    data = []
    n = 0
    while n < num:
        x = random.uniform(-outer_radius, outer_radius)
        y = random.uniform(-outer_radius, outer_radius)
        z = random.uniform(-outer_radius, outer_radius)
        dist = math.sqrt( x * x + y * y + z * z)
        if dist <= outer_radius:
            data.append( (x, y, z) )
            n = n + 1
    return data

#-----
def hollow_spherical(num, outer_radius, inner_radius):
    data = []
    n = 0
    while n < num:
        x = random.uniform(-outer_radius, outer_radius)
        y = random.uniform(-outer_radius, outer_radius)
        z = random.uniform(-outer_radius, outer_radius)
        dist = math.sqrt(x * x + y * y + z * z)
        if dist <= outer_radius and dist >= inner_radius:
            data.append( (x,y,z) )
            n = n + 1
    return data

#-----
def box(num, width, height, depth):
    data = []
    for n in range(num):
        x = random.uniform(-width/2, width/2)
        y = random.uniform(-height/2, height/2)
        z = random.uniform(-depth/2, depth/2)
        data.append( (x, y, z) )
    return data

#-----
def disk(num, radius):
    data = []
    n = 0

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while n < num:
    x = random.uniform(-radius, radius)
    y = 0
    z = random.uniform(-radius, radius)
    dist = math.sqrt( x * x + y * y + z * z)
    if dist <= radius:
        data.append( (x, y, z) )
        n = n + 1
return data
#-----
def cylindrical(num, radius, height):
    data = []
    n = 0
    while n < num:
        x = random.uniform(-radius, radius)
        y = 0
        z = random.uniform(-radius, radius)
        dist = math.sqrt( x * x + y * y + z * z)
        if dist <= radius:
            y = random.uniform(0, height)
            data.append( (x, y, z) )
            n = n + 1
    return data
#-----
def cone(num, radius, height):
    data = []
    n = 0
    while n < num:
        x = random.uniform(-radius, radius)
        z = random.uniform(-radius, radius)
        dist = math.sqrt( x * x + z * z)
        y = random.uniform(0, height)
        r = 1 - y/height
        if dist <= r:
            data.append( (x, y, z) )
            n = n + 1
    return data
#-----
if __name__ == '__main__':
    pass
    #coords = cubic(20,4)
    #for coord in coords:
    #    print(coord)

```