

## Mobility Script

**Software Recommended:** NetSim Academic/Standard/Pro (32/64 bit), Python 3.7

**Project Download Link:**

[https://github.com/NetSim-TETCOS/Intrusion\\_Detection\\_Systems\\_for\\_MANETs\\_v13.0/archive/refs/heads/main.zip](https://github.com/NetSim-TETCOS/Intrusion_Detection_Systems_for_MANETs_v13.0/archive/refs/heads/main.zip)

## Introduction

Mobility python script allows user to automatically generate the mobility.txt file without the need for manually writing from GUI. Mobility python script meets the user requirements which involves changing the value of time and distance co-ordinates.

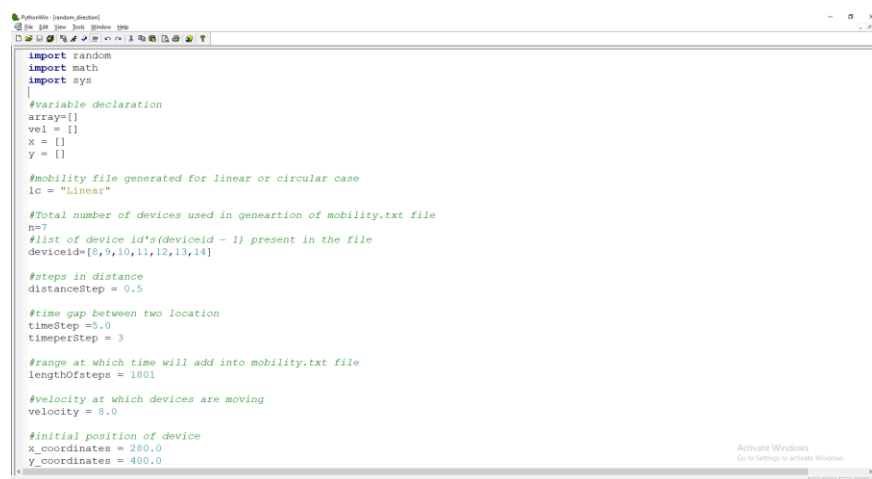
## Variables used in Mobility python code for generating mobility.txt

1. lc – This is used to get either linear or circular form of mobility file.
2. n - Total number of devices in which file-based mobility is enabled.
3. deviceid – list of device id's that user wants to add into the mobility file.
4. vel - Velocity at which device will moves from one point to another.
5. x\_coordinate –Initial position of device.
6. y\_coordinate –Initial position of device.
7. distancestep – It is used in finding the next location for each device.
8. timeperStep – Time gap between two location.
9. timeStep – It is used along with timeperStep to get the time value for node to move.
10. lengthOfsteps - Range in which, time value will add into mobility file.

## How to generate Mobility.txt file

### Case 1: Mobility file for uniform straight-line motion

1. Open the random.py script in python IDE.
2. User can modify parameters like lc, n, distancestep, timeperStep, timeStep, vel and x, y coordinates

A screenshot of a Python IDE window titled 'PythonFile: random.py'. The code is as follows:

```
import random
import math
import sys
|
#Variable declaration
array=[]
vel = []
x = []
y = []

#mobility file generated for linear or circular case
lc = "Linear"

#Total number of devices used in generation of mobility.txt file
n=7
#List of device id's(deviceid - 1) present in the file
deviceid=[8,9,10,11,12,13,14]

#Steps in distance
distancestep = 0.5

#Time gap between two location
timeStep =5.0
timeperStep = 3

#Range at which time will add into mobility.txt file
lengthOfsteps = 1801

#Velocity at which devices are moving
velocity = 8.0

#Initial position of device
x_coordinates = 280.0
y_coordinates = 400.0
```

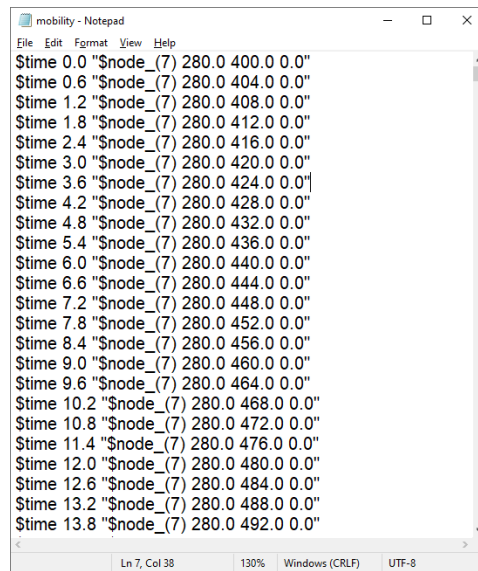
3. Generating Mobility file is started by opening command prompt in the directory of the Mobility script project and starting the python script as shown below.



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19041.804]
(c) 2020 Microsoft Corporation. All rights reserved.

D:\AE_Task\mobility_Script>python random.py
```

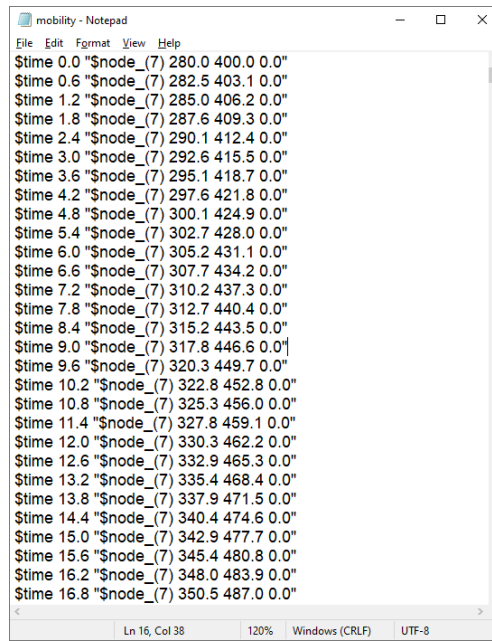
4. After executing the command mobility.txt file will be created in the same folder that contains the random.py python script.
5. A sample uniform straight line mobility file generated using this script is shown below.



```
mobility - Notepad
File Edit Format View Help
$time 0.0 "$node_(7) 280.0 400.0 0.0"
$time 0.6 "$node_(7) 280.0 404.0 0.0"
$time 1.2 "$node_(7) 280.0 408.0 0.0"
$time 1.8 "$node_(7) 280.0 412.0 0.0"
$time 2.4 "$node_(7) 280.0 416.0 0.0"
$time 3.0 "$node_(7) 280.0 420.0 0.0"
$time 3.6 "$node_(7) 280.0 424.0 0.0"
$time 4.2 "$node_(7) 280.0 428.0 0.0"
$time 4.8 "$node_(7) 280.0 432.0 0.0"
$time 5.4 "$node_(7) 280.0 436.0 0.0"
$time 6.0 "$node_(7) 280.0 440.0 0.0"
$time 6.6 "$node_(7) 280.0 444.0 0.0"
$time 7.2 "$node_(7) 280.0 448.0 0.0"
$time 7.8 "$node_(7) 280.0 452.0 0.0"
$time 8.4 "$node_(7) 280.0 456.0 0.0"
$time 9.0 "$node_(7) 280.0 460.0 0.0"
$time 9.6 "$node_(7) 280.0 464.0 0.0"
$time 10.2 "$node_(7) 280.0 468.0 0.0"
$time 10.8 "$node_(7) 280.0 472.0 0.0"
$time 11.4 "$node_(7) 280.0 476.0 0.0"
$time 12.0 "$node_(7) 280.0 480.0 0.0"
$time 12.6 "$node_(7) 280.0 484.0 0.0"
$time 13.2 "$node_(7) 280.0 488.0 0.0"
$time 13.8 "$node_(7) 280.0 492.0 0.0"
Ln 7, Col 38 130% Windows (CRLF) UTF-8
```

## Case 2: Mobility file for uniform circular motion

1. Users need to set lc = "Circular" and other steps are similar as above.
2. A sample uniform circular mobility file generated using this script is shown below.



```
File Edit Format View Help
$time 0.0 "$node_(7) 280.0 400.0 0.0"
$time 0.6 "$node_(7) 282.5 403.1 0.0"
$time 1.2 "$node_(7) 285.0 406.2 0.0"
$time 1.8 "$node_(7) 287.6 409.3 0.0"
$time 2.4 "$node_(7) 290.1 412.4 0.0"
$time 3.0 "$node_(7) 292.6 415.5 0.0"
$time 3.6 "$node_(7) 295.1 418.7 0.0"
$time 4.2 "$node_(7) 297.6 421.8 0.0"
$time 4.8 "$node_(7) 300.1 424.9 0.0"
$time 5.4 "$node_(7) 302.7 428.0 0.0"
$time 6.0 "$node_(7) 305.2 431.1 0.0"
$time 6.6 "$node_(7) 307.7 434.2 0.0"
$time 7.2 "$node_(7) 310.2 437.3 0.0"
$time 7.8 "$node_(7) 312.7 440.4 0.0"
$time 8.4 "$node_(7) 315.2 443.5 0.0"
$time 9.0 "$node_(7) 317.8 446.6 0.0"
$time 9.6 "$node_(7) 320.3 449.7 0.0"
$time 10.2 "$node_(7) 322.8 452.8 0.0"
$time 10.8 "$node_(7) 325.3 456.0 0.0"
$time 11.4 "$node_(7) 327.8 459.1 0.0"
$time 12.0 "$node_(7) 330.3 462.2 0.0"
$time 12.6 "$node_(7) 332.9 465.3 0.0"
$time 13.2 "$node_(7) 335.4 468.4 0.0"
$time 13.8 "$node_(7) 337.9 471.5 0.0"
$time 14.4 "$node_(7) 340.4 474.6 0.0"
$time 15.0 "$node_(7) 342.9 477.7 0.0"
$time 15.6 "$node_(7) 345.4 480.8 0.0"
$time 16.2 "$node_(7) 348.0 483.9 0.0"
$time 16.8 "$node_(7) 350.5 487.0 0.0"
Ln 16, Col 38 120% Windows (CRLF) UTF-8
```

The script can be modified to generate mobility patterns in addition to those that are supported currently.