TYBSc CS 2020-2021 USCS607:Wireless Sensor Network

RollNo: 18043 Date: 03/02/2021

**Practical No.:4**

**Aim: Create simple Adhoc network.**

**Simulator used : Omnet++**

● Simulator can be downloaded from link: **https://omnetpp.org/download/old**

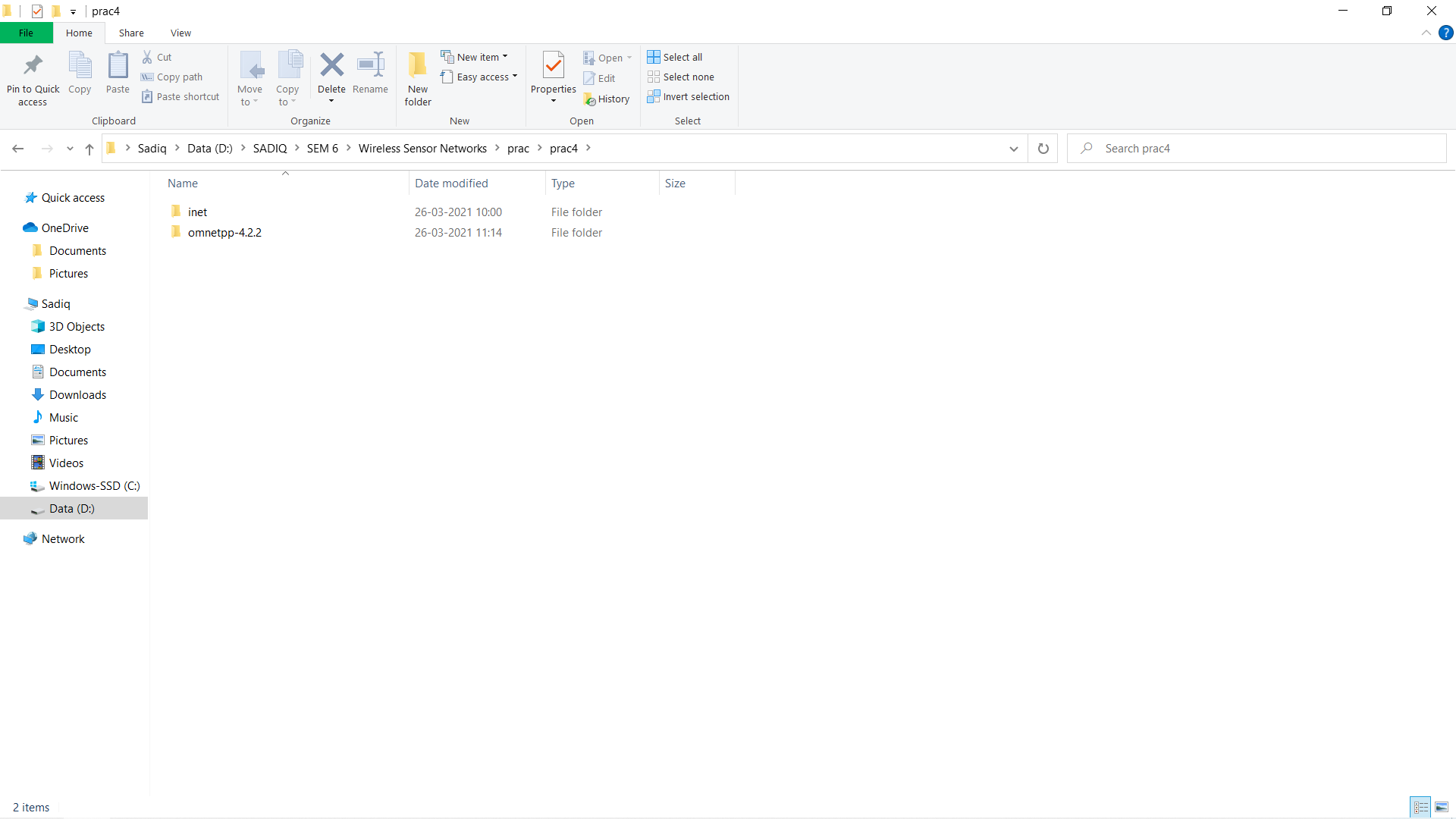
● After installing Omnet++, we need to install inet framework which is specially designed for wireless simulation. You can download inet framework from link : [**https://inet.omnetpp.org/Download.html**](https://inet.omnetpp.org/Download.html)

● After downloading there are certain steps to be followed to include this framework in omnet++ as follows:

● **Download the INET sources.**

**● Unpack it into the directory of your choice**

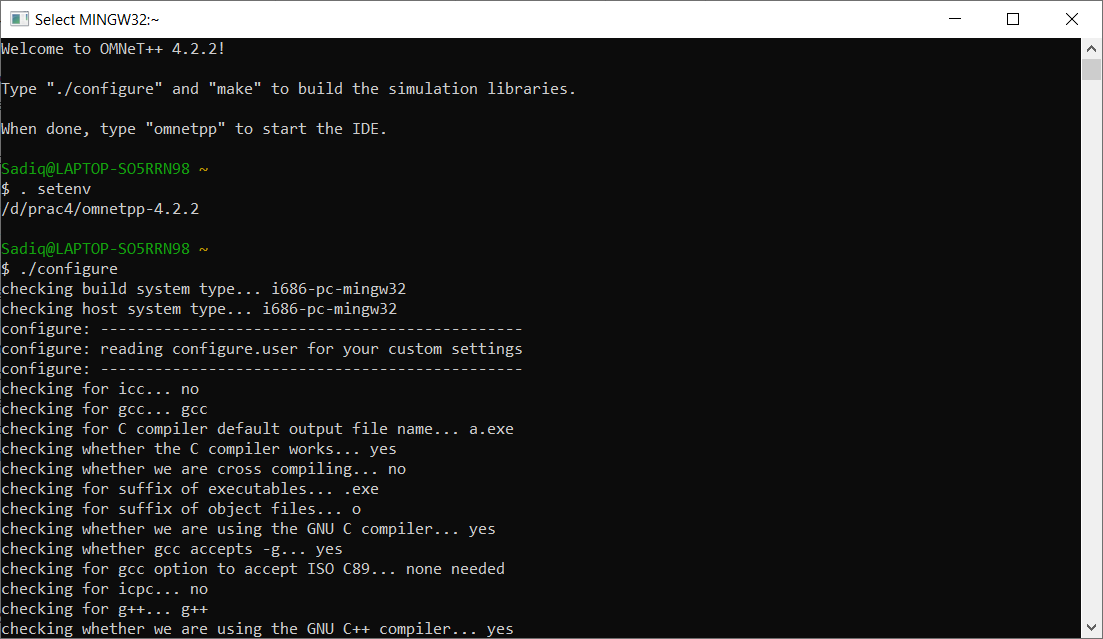
**● Recommeded version is inet 2.1**

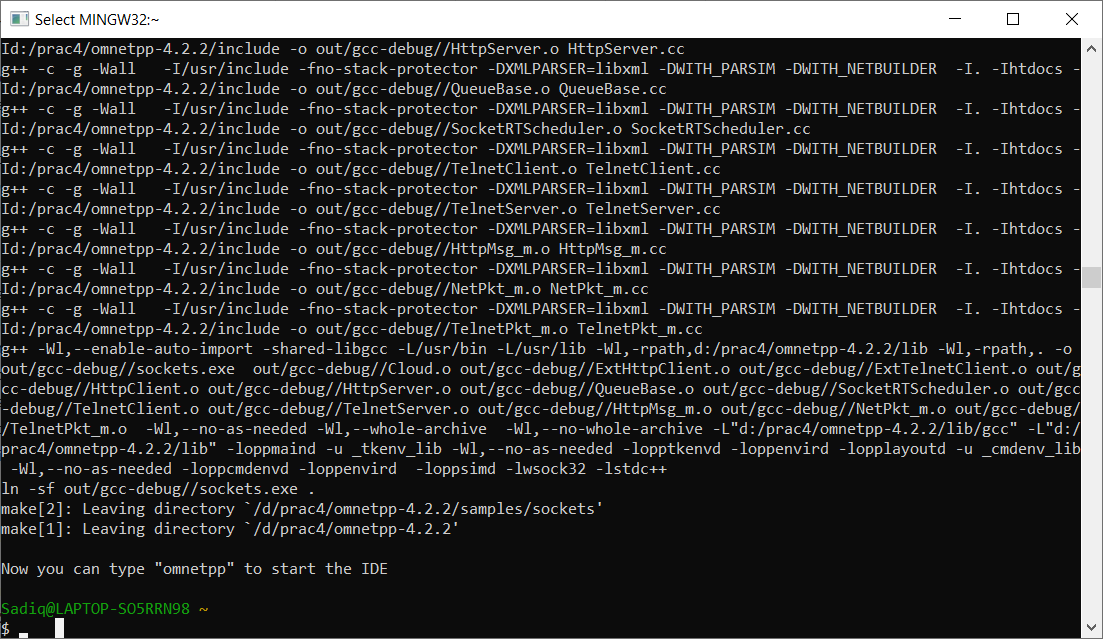


* **Now install omnet++ as shown below:**

**Open MINGW32 in extracted omnet++ folder and type :**

1. **. setenv**
2. **./configure**
3. **make**

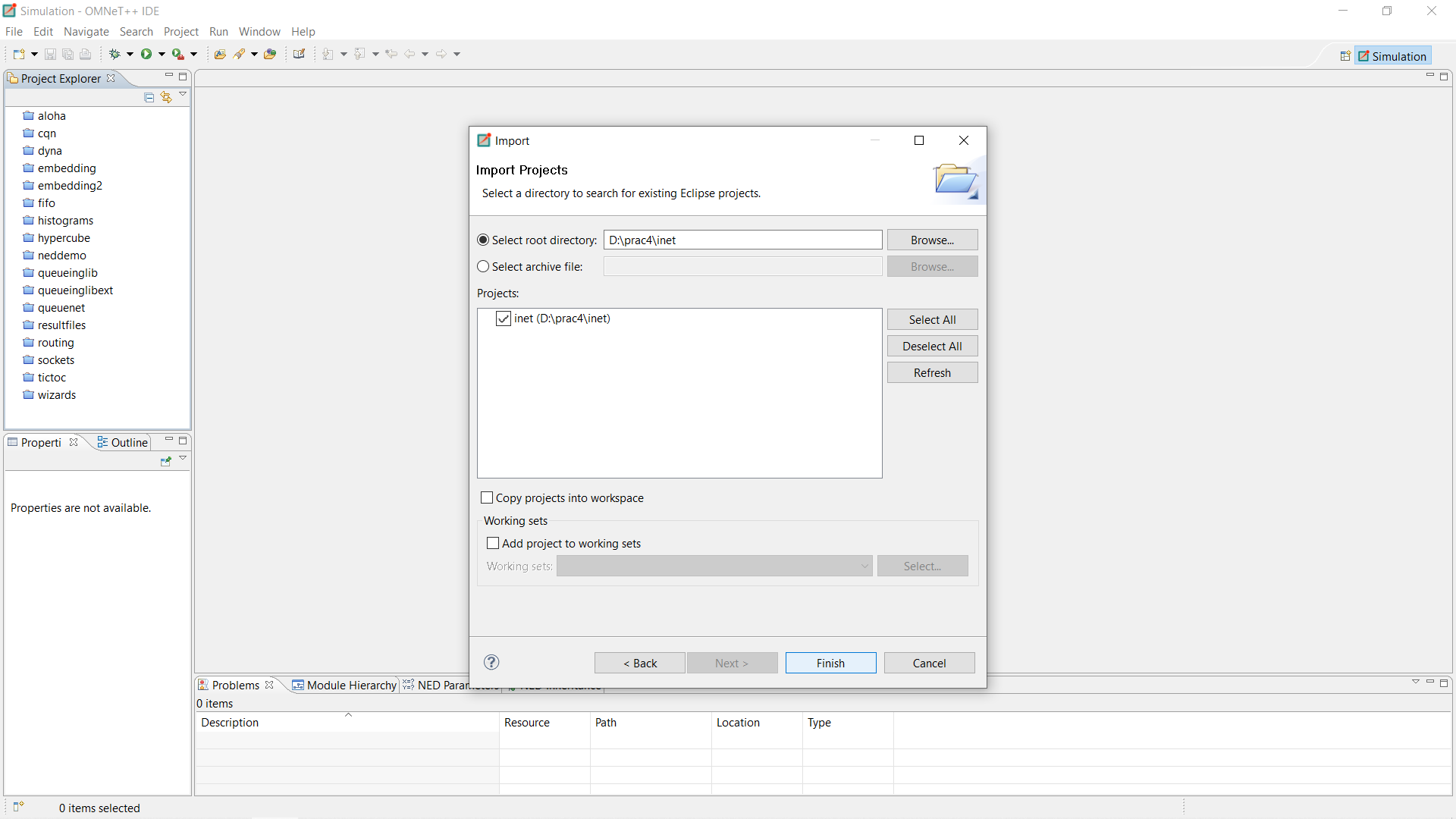
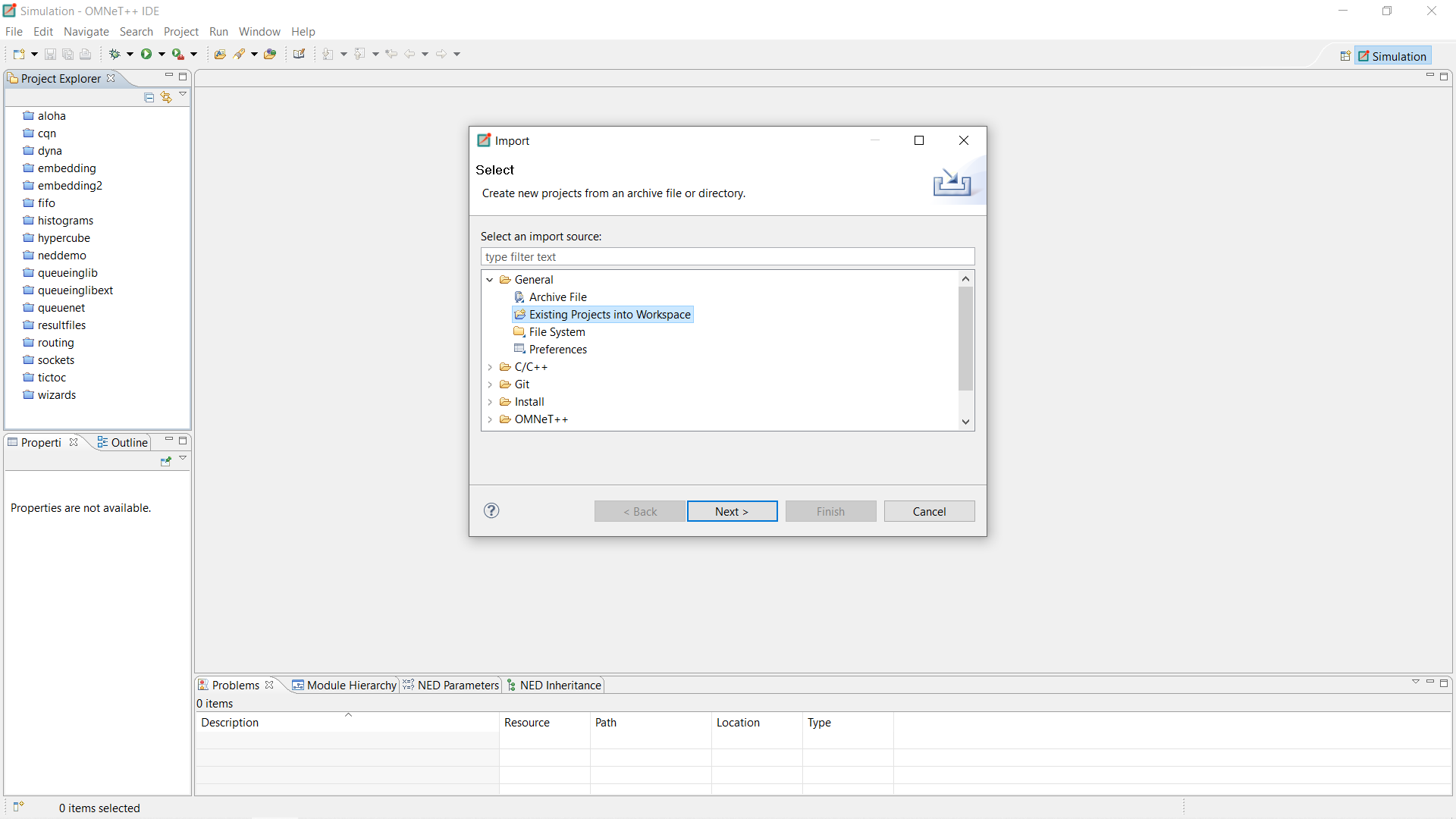




**● Start the Omnet++ IDE, and import the project via File -> Import -> Existing Projects to the Workspace. A project named inet should appear.**

**● Build with Project -> Build, or hit ctrl+b**

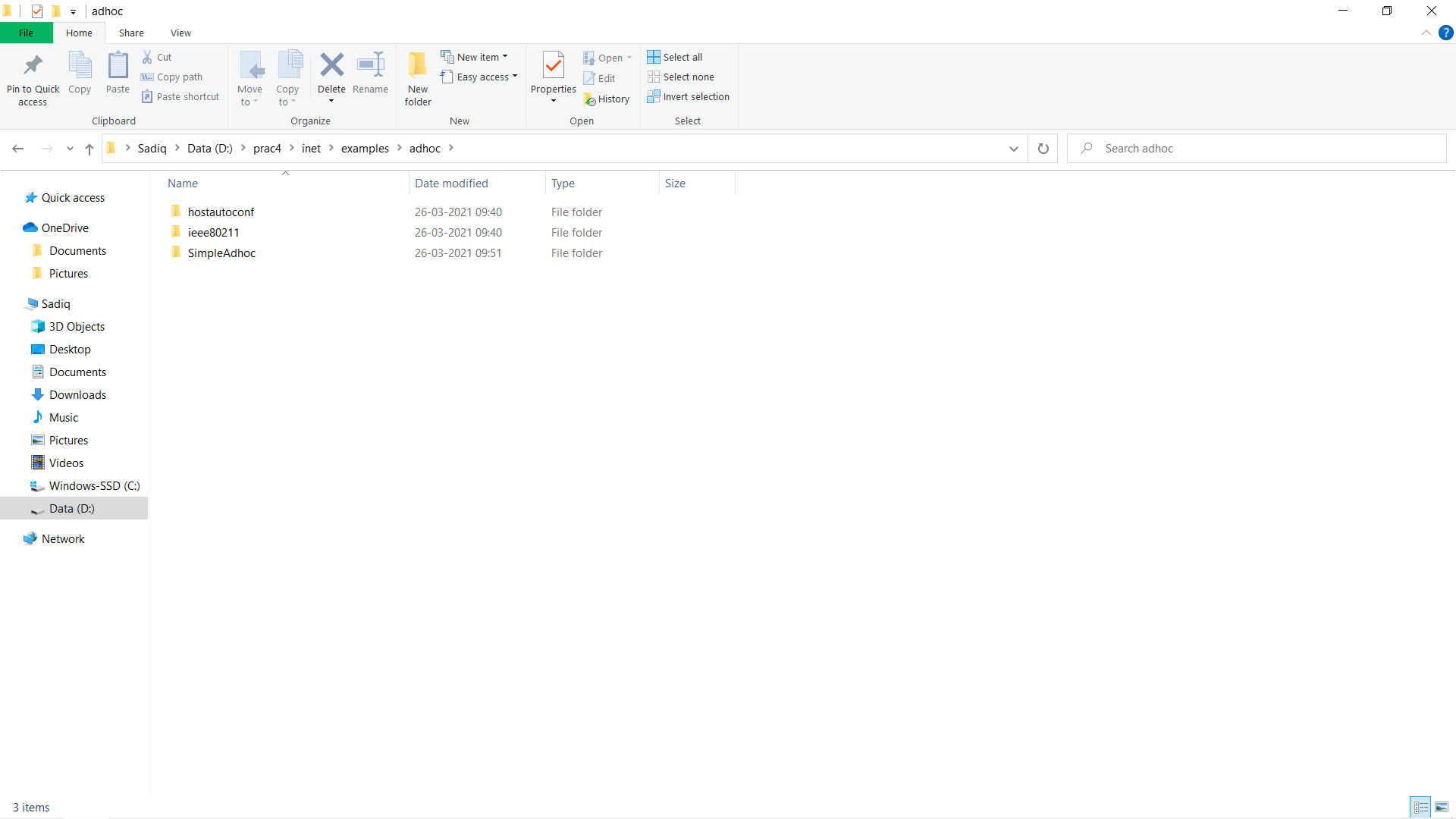
**● Now you should be able to launch example simulations.**



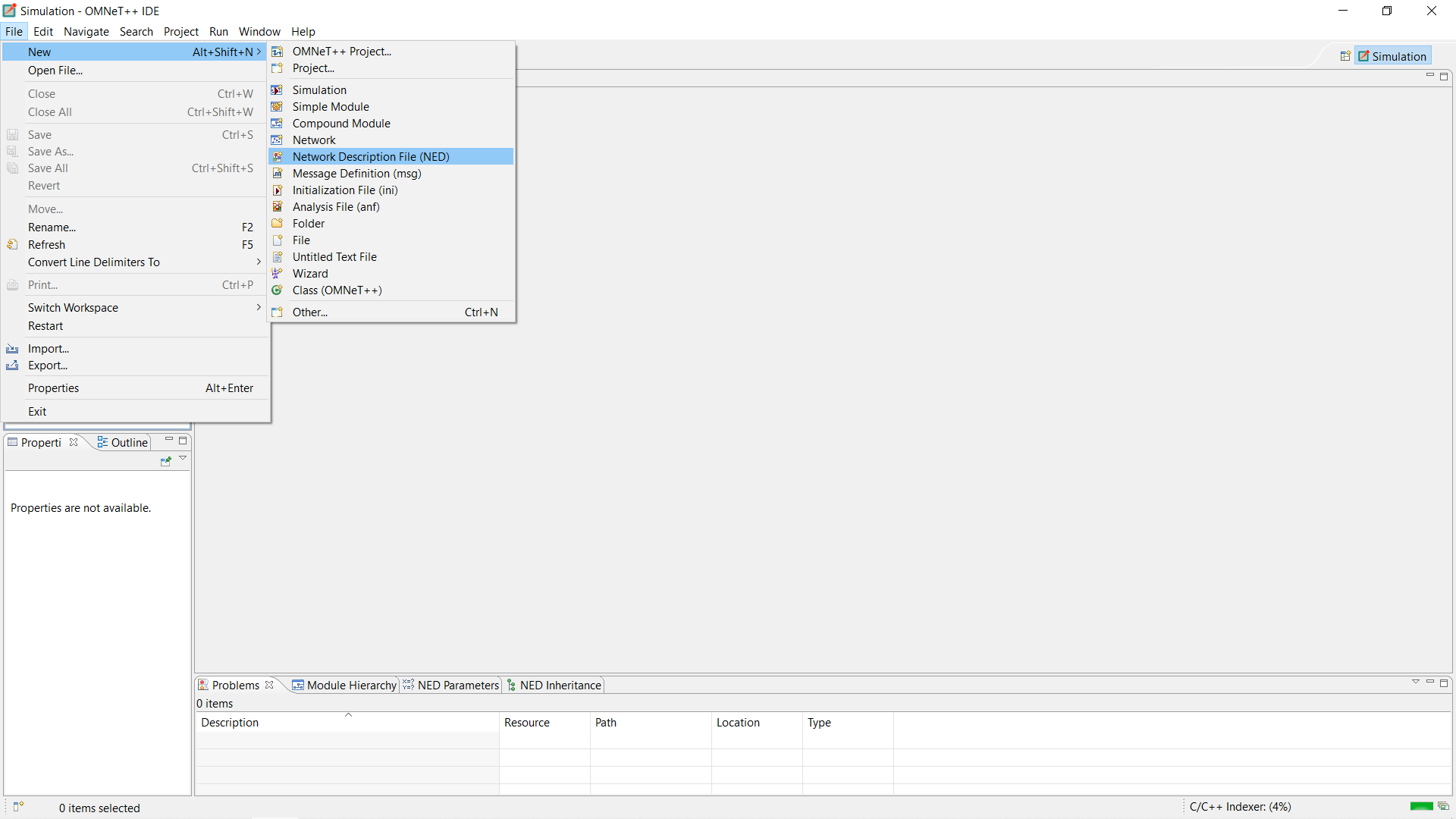
**Steps for practical:**

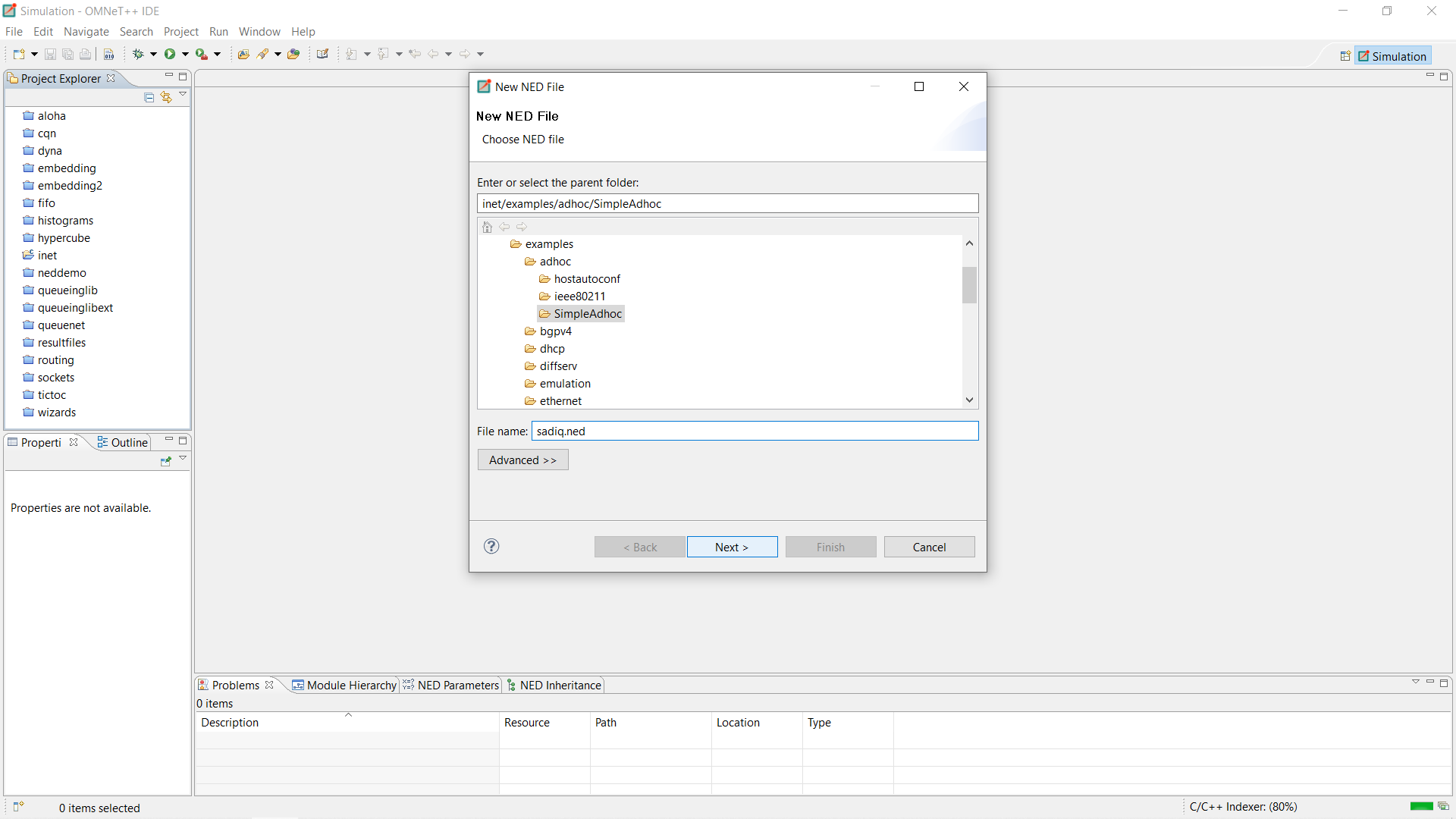
**● Then open inet/examples/**

**● Right click on adhoc -create new folder as SimpleAdhoc.**

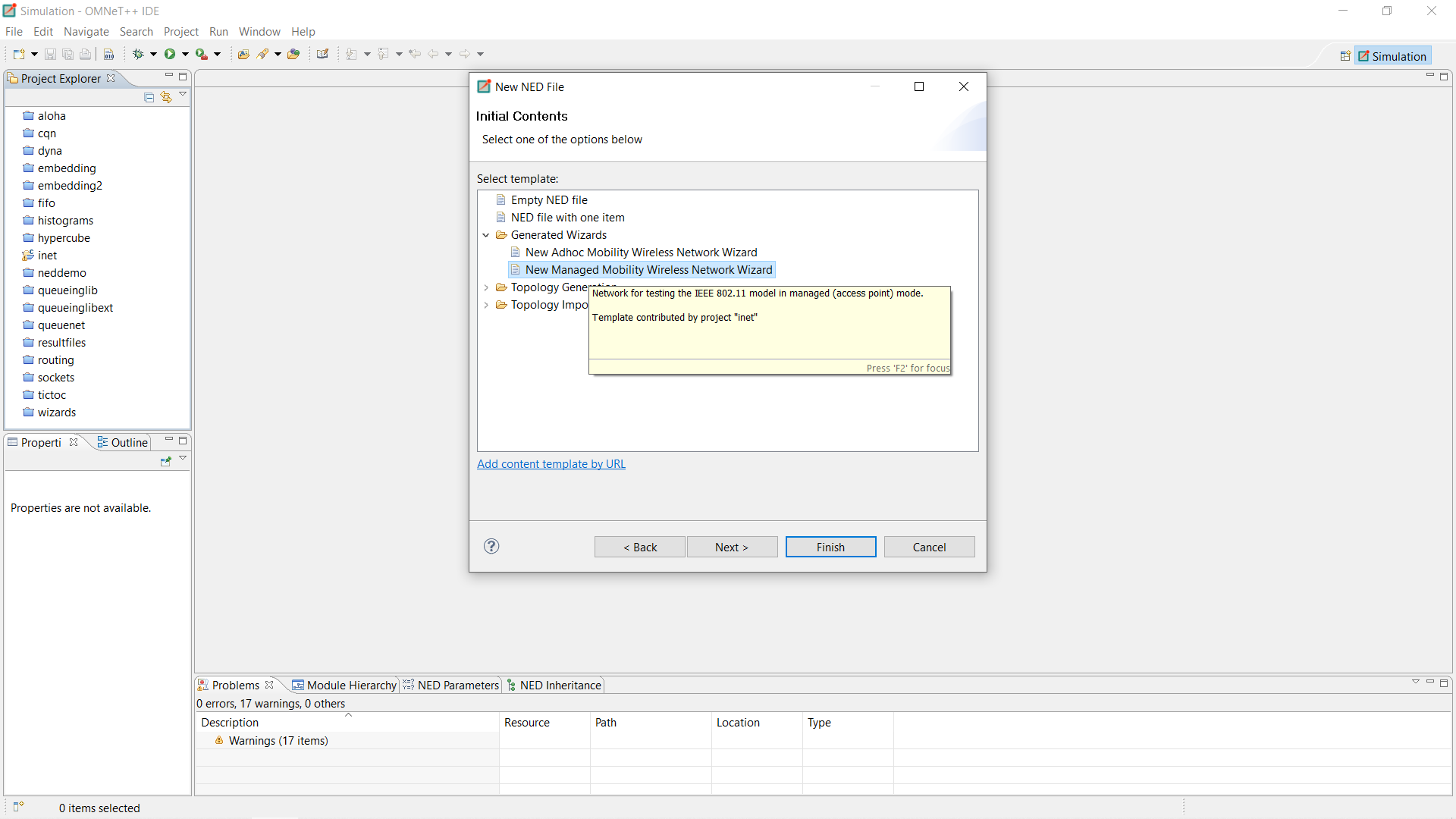


**● Right click on your newly created folder and select NED file. Give name as sadiq**

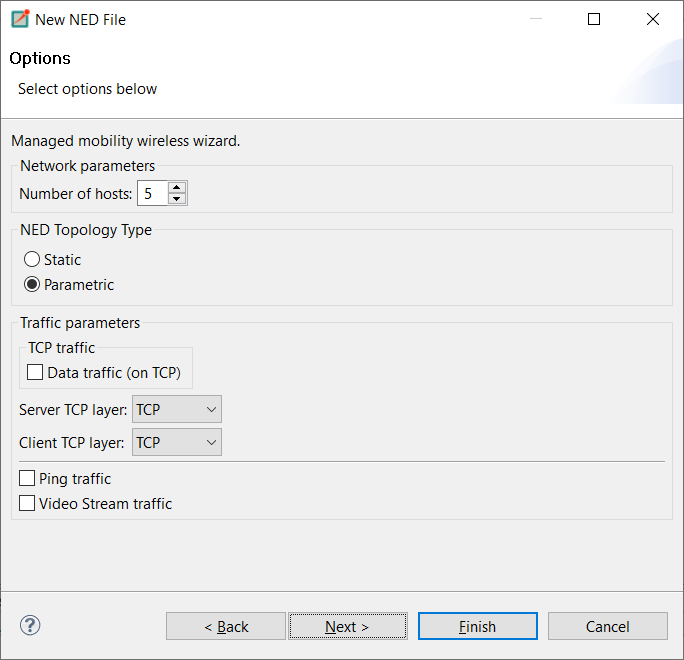




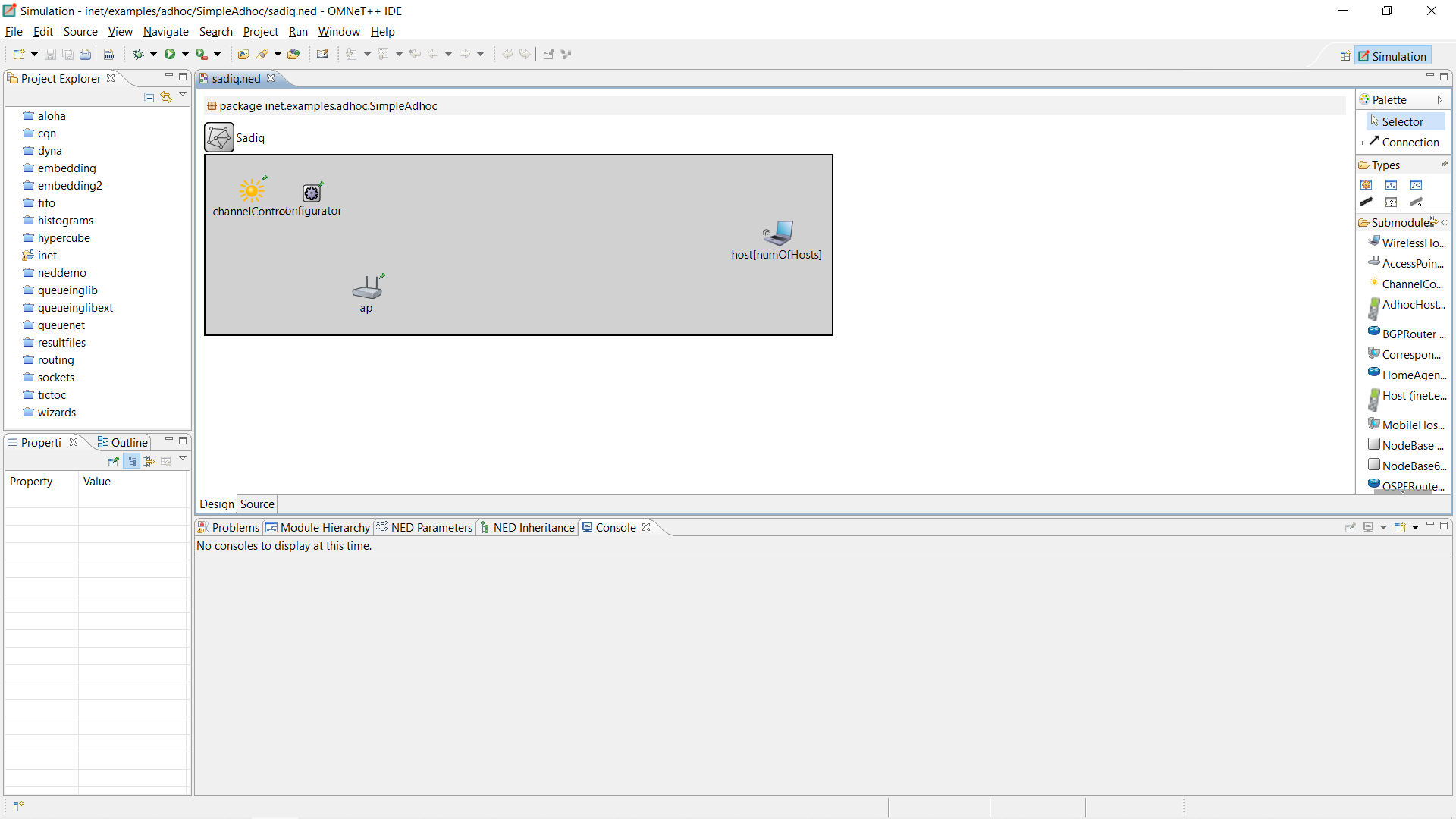
**●Click on new manages mobility wireless network wizard.**



**●Then configure as follows:**



**●Then click on finish.**



**● Below is the code that will be available in source part of sadiq.ned once configured.**

**package** inet.examples.adhoc.SimpleAdhoc;

*// numOfHosts: 5*

**import** inet.networklayer.autorouting.ipv4.IPv4NetworkConfigurator;

**import** inet.nodes.inet.WirelessHost;

**import** inet.nodes.wireless.AccessPoint;

**import** inet.world.radio.ChannelControl;

**network** Net

{

**parameters**:

**int** numOfHosts;

**submodules**:

host[numOfHosts]: WirelessHost

{

**@display**("r=,,#707070");

}

ap: AccessPoint

{

**@display**("p=213,174;r=,,#707070");

}

channelControl: ChannelControl

{

numChannels = 2;

**@display**("p=61,46");

}

configurator: IPv4NetworkConfigurator

{

**@display**("p=140,50");

}

}

**● On design part you will find components appearing according to the code as the above snapshot.**

**Same as do this in omnetpp.ini file :**

**Source code for omnetpp.ini:**

[General]

network = Net1

\*.numOfHosts = 5

*#debug-on-errors = true*

tkenv-plugin-path = ../../../etc/plugins

\*\*.constraintAreaMinX = 0m

\*\*.constraintAreaMinY = 0m

\*\*.constraintAreaMinZ = 0m

\*\*.constraintAreaMaxX = 600m

\*\*.constraintAreaMaxY = 400m

\*\*.constraintAreaMaxZ = 0m

\*\*.debug = **true**

\*\*.coreDebug = **false**

\*\*.host\*.\*\*.channelNumber = 0

*# channel physical parameters*

\*.channelControl.carrierFrequency = 2.4GHz

\*.channelControl.pMax = 2.0mW

\*.channelControl.sat = -110dBm

\*.channelControl.alpha = 2

*# mobility*

\*\*.host\*.mobilityType = "MassMobility"

\*\*.host\*.mobility.initFromDisplayString = **false**

\*\*.host\*.mobility.changeInterval = truncnormal(2s, 0.5s)

\*\*.host\*.mobility.changeAngleBy = normal(0deg, 30deg)

\*\*.host\*.mobility.speed = truncnormal(20mps, 8mps)

\*\*.host\*.mobility.updateInterval = 100ms

*# ping app (host[0] pinged by others)*

\*.host[0].numPingApps = 0

\*.host[\*].numPingApps = 2

\*.host[\*].pingApp[\*].destAddr = "host[0]"

\*\*.pingApp[0].startTime = uniform(1s,5s)

\*\*.pingApp[1].startTime = 5s+uniform(1s,5s)

\*\*.pingApp[\*].printPing = **true**

*# nic settings*

\*\*.wlan[\*].bitrate = 2Mbps

\*\*.wlan[\*].mgmt.frameCapacity = 10

\*\*.wlan[\*].mac.address = "auto"

\*\*.wlan[\*].mac.maxQueueSize = 14

\*\*.wlan[\*].mac.rtsThresholdBytes = 3000B

\*\*.wlan[\*].mac.retryLimit = 7

\*\*.wlan[\*].mac.cwMinData = 7

\*\*.wlan[\*].radio.transmitterPower = 2mW

\*\*.wlan[\*].radio.thermalNoise = -110dBm

\*\*.wlan[\*].radio.sensitivity = -85dBm

\*\*.wlan[\*].radio.pathLossAlpha = 2

\*\*.wlan[\*].radio.snirThreshold = 4dB

[Config Ping1]

description = "host1 pinging host0"

[Config Ping2] *# interactive*

description = "n hosts"

*# leave numHosts undefined here*

\*\*.mobility.constraintAreaMinZ = 0m

\*\*.mobility.constraintAreaMaxZ = 0m

\*\*.mobility.constraintAreaMinX = 0m

\*\*.mobility.constraintAreaMinY = 0m

\*\*.mobility.constraintAreaMaxX = 600m

\*\*.mobility.constraintAreaMaxY = 400m

\*\*.debug = **false**

\*\*.coreDebug = **false**

\*\*.channelNumber = 0

*# channel physical parameters*

\*.channelControl.carrierFrequency = 2.4GHz

\*.channelControl.pMax = 20.0mW

\*.channelControl.sat = -110dBm

\*.channelControl.alpha = 2

*# mobility*

\*\*.host[\*].mobilityType = "MassMobility"

\*\*.host[\*].mobility.changeInterval = truncnormal(2s, 0.5s)

\*\*.host[\*].mobility.changeAngleBy = normal(0deg, 30deg)

\*\*.host[\*].mobility.speed = truncnormal(20mps, 8mps)

\*\*.host[\*].mobility.updateInterval = 100ms

*# nic settings*

\*\*.bitrate = 2Mbps

\*\*.mac.address = "auto"

\*\*.mac.maxQueueSize = 14

\*\*.mac.rtsThresholdBytes = 3000B

\*\*.wlan[\*].mac.retryLimit = 7

\*\*.wlan[\*].mac.cwMinData = 7

\*\*.wlan[\*].mac.cwMinMulticast = 31

\*\*.radio.transmitterPower = 20.0mW

\*\*.radio.carrierFrequency = 2.4GHz

\*\*.radio.thermalNoise = -110dBm

\*\*.radio.sensitivity = -85dBm

\*\*.radio.pathLossAlpha = 2

\*\*.radio.snirThreshold = 4dB

*# relay unit configuration*

\*\*.relayUnitType = "MACRelayUnitNP"

\*\*.relayUnit.addressTableSize = 100

\*\*.relayUnit.agingTime = 120s

\*\*.relayUnit.bufferSize = 1MiB

\*\*.relayUnit.highWatermark = 512KiB

\*\*.relayUnit.pauseUnits = 300 *# pause for 300\*512 bit (19200 byte) time*

\*\*.relayUnit.addressTableFile = ""

\*\*.relayUnit.numCPUs = 2

\*\*.relayUnit.processingTime = 2us

**EXECUTION:**

**Now try to execute by right click on ned file Run as-1-Omnet++ simulation.**

