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AIM: Study and installation of Network Simulator.



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Steps for install ns2 in ubuntu 22.04.1

Step 1: Update your system using this command (Run command in terminal)

sudo apt update

Step2: Install Build Essential using this command (Run command in terminal)

sudo apt install build-essential autoconf automake libxmu-dev

Step3: For ns2 you require to install gcc-4.8 and g++-4.8 it's available only

up to ubuntu 18.04 version which the codename is bionic for that we need to modify sources.list file for that follow steps.

- Open sources.list file by using this command (Run command in terminal)
sudo gedit /etc/apt/sources.list
- After that we add one line in this file at the end of the file.
deb http://in.archive.ubuntu.com/ubuntu/ bionic main universe
- Make entry of above line in sources.list file and save it.

Step4: After that update your system by using this command (Run command in terminal)

sudo apt update

- During update if we face this type of error don't worry about it
- ❖ The following signatures couldn't be verified because the public key is not available:
NO_PUBKEY 3B4FE6ACC0B21F32

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Solution:

- Run this command but remember we need to put your own public key in this command that provided in the error just copy and past it in command. (Run command in terminal)
- In my case public key is **3B4FE6ACC0B21F32** in your case public is different.

sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys 3B4FE6ACC0B21F32

Step5: After that update your system again (Run command in terminal)

sudo apt update

Step6: After that install gcc-4.8 and g++-4.8 by using this command. (Run command in terminal)

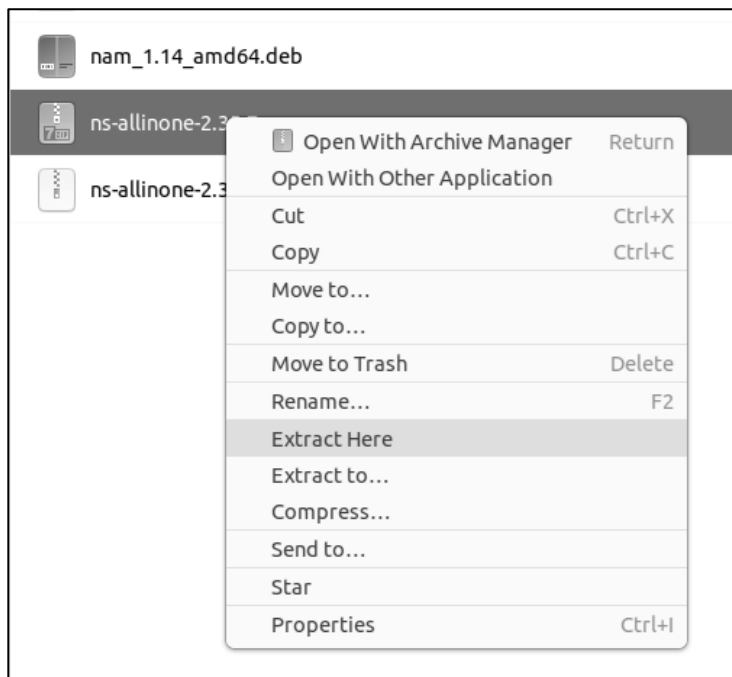
sudo apt install gcc-4.8 g++-4.8

Step7: After Installation of gcc-4.8 and g++-4.8 web need ns-allinone 2.35 file that available on this link simply download it.

Download NS2 source file from this link.

<https://drive.google.com/file/d/1sDlA6wJpWmTgFfBiv6WeAoab82Kzd2tS/view?usp=sharing>

Step8: After that extract it.



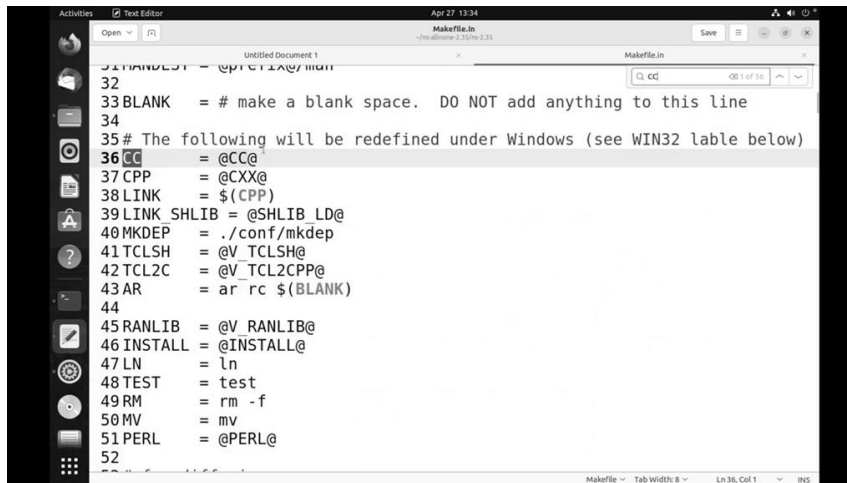
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Step9: After extract process is finished we need to modify some files as follow.

9.1: open ns-allinone-2.35/ns-2.35/Makefile.in file find this

CC = @CC@

CPP = @CXX@

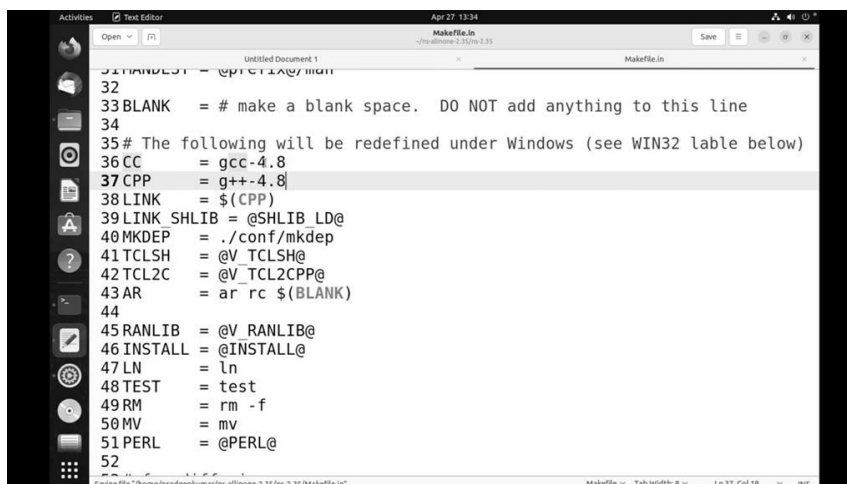


```
32
33 BLANK = # make a blank space. DO NOT add anything to this line
34
35 # The following will be redefined under Windows (see WIN32 table below)
36 CC = @CC@
37 CPP = @CXX@
38 LINK = $(CPP)
39 LINK_SHLIB = @SHLIB_LD@
40 MKDEP = ./conf/mkdep
41 TCLSH = @V_TCLSH@
42 TCL2C = @V_TCL2CPP@
43 AR = ar rc $(BLANK)
44
45 RANLIB = @V_RANLIB@
46 INSTALL = @INSTALL@
47 LN = ln
48 TEST = test
49 RM = rm -f
50 MV = mv
51 PERL = @PERL@
52
```

and replace with

CC = gcc-4.8

CPP = g++-4.8



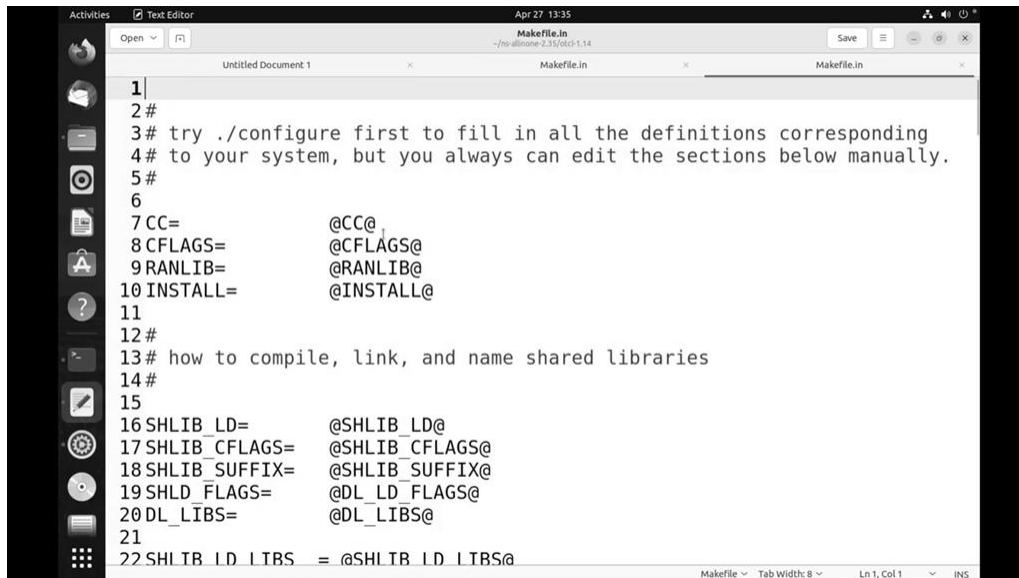
```
32
33 BLANK = # make a blank space. DO NOT add anything to this line
34
35 # The following will be redefined under Windows (see WIN32 table below)
36 CC = gcc-4.8
37 CPP = g++-4.8
38 LINK = $(CPP)
39 LINK_SHLIB = @SHLIB_LD@
40 MKDEP = ./conf/mkdep
41 TCLSH = @V_TCLSH@
42 TCL2C = @V_TCL2CPP@
43 AR = ar rc $(BLANK)
44
45 RANLIB = @V_RANLIB@
46 INSTALL = @INSTALL@
47 LN = ln
48 TEST = test
49 RM = rm -f
50 MV = mv
51 PERL = @PERL@
52
```

Save file and close

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9.2: open `ns-allinone-2.35/otcl-1.1.4/Makefile.in` file find this

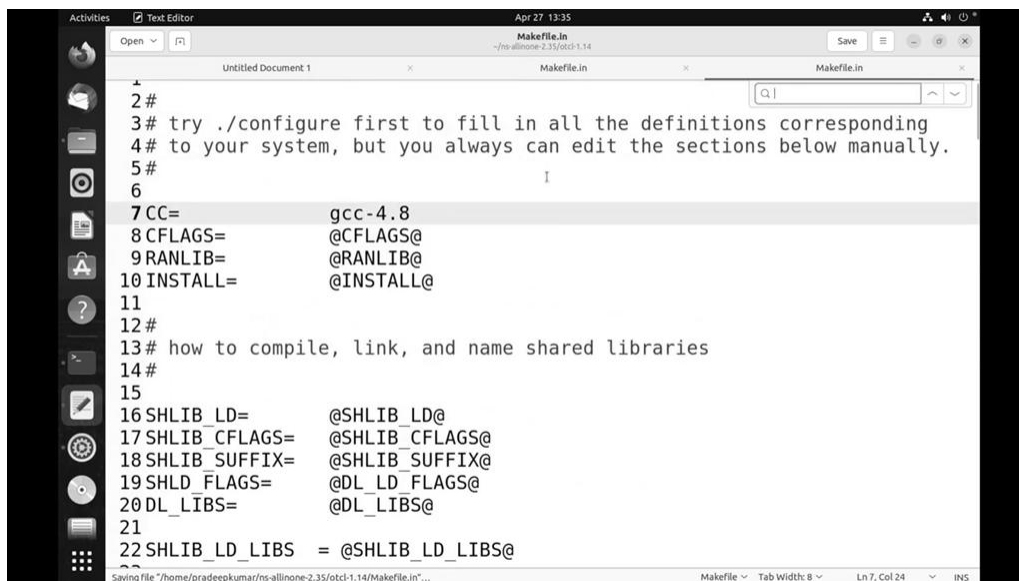
`CC= @CC@`



```
1|
2#
3# try ./configure first to fill in all the definitions corresponding
4# to your system, but you always can edit the sections below manually.
5#
6
7CC=          @CC@
8CFLAGS=      @CFLAGS@
9RANLIB=      @RANLIB@
10INSTALL=    @INSTALL@
11
12#
13# how to compile, link, and name shared libraries
14#
15
16SHLIB_LD=    @SHLIB_LD@
17SHLIB_CFLAGS= @SHLIB_CFLAGS@
18SHLIB_SUFFIX= @SHLIB_SUFFIX@
19SHLD_FLAGS=  @DL_LD_FLAGS@
20DL_LIBS=     @DL_LIBS@
21
22SHLIB_LD_LIBS = @SHLIB_LD_LIBS@
```

and replace with

`CC= gcc-4.8`



```
1#
2#
3# try ./configure first to fill in all the definitions corresponding
4# to your system, but you always can edit the sections below manually.
5#
6
7CC=          gcc-4.8
8CFLAGS=      @CFLAGS@
9RANLIB=      @RANLIB@
10INSTALL=    @INSTALL@
11
12#
13# how to compile, link, and name shared libraries
14#
15
16SHLIB_LD=    @SHLIB_LD@
17SHLIB_CFLAGS= @SHLIB_CFLAGS@
18SHLIB_SUFFIX= @SHLIB_SUFFIX@
19SHLD_FLAGS=  @DL_LD_FLAGS@
20DL_LIBS=     @DL_LIBS@
21
22SHLIB_LD_LIBS = @SHLIB_LD_LIBS@
```

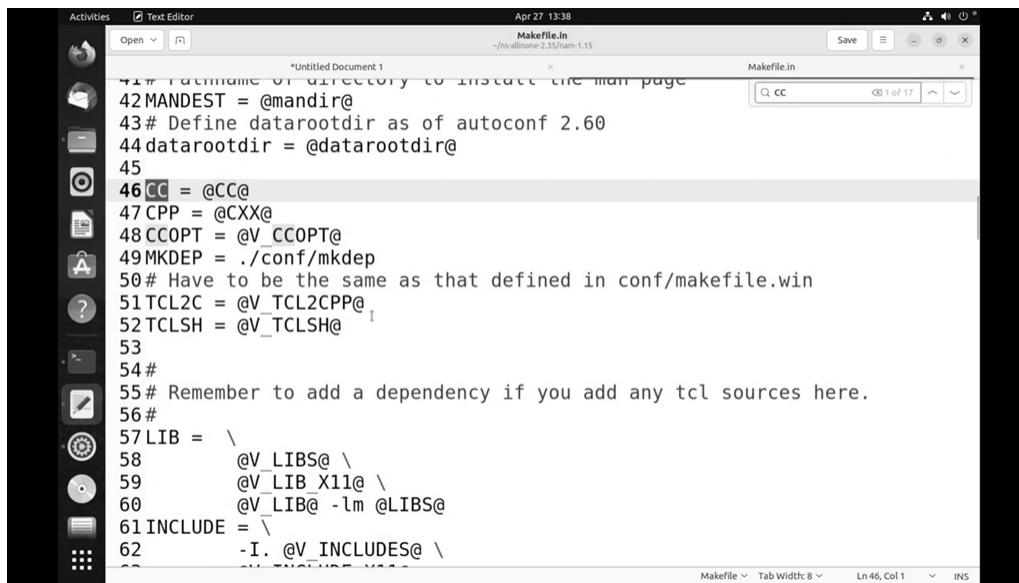
Save file and close

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9.3: open **ns-allinone-2.35/nam-1.15/Makefile.in** file find this

CC = @CC@

CPP = @CXX@

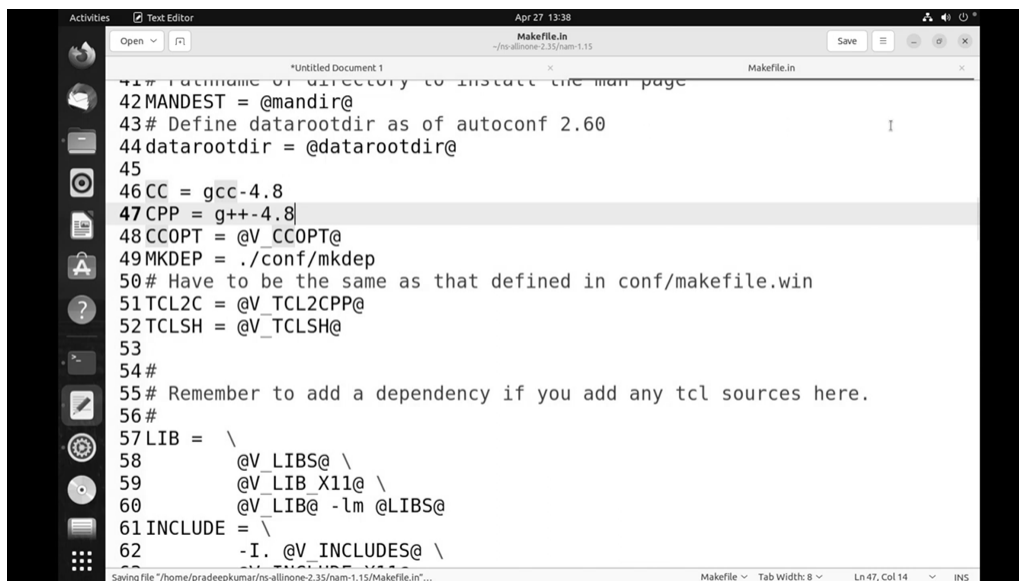


```
41# Pathname of directory to install the man page
42MANDEST = @mandir@
43# Define datarootdir as of autoconf 2.60
44datarootdir = @datarootdir@
45
46CC = @CC@
47CPP = @CXX@
48CCOPT = @V_CCOPT@
49MKDEP = ./conf/mkdep
50# Have to be the same as that defined in conf/makefile.win
51TCL2C = @V_TCL2CPP@
52TCLSH = @V_TCLSH@
53
54#
55# Remember to add a dependency if you add any tcl sources here.
56#
57LIB = \
58    @V_LIBS@ \
59    @V_LIB_X11@ \
60    @V_LIB@ -lm @LIBS@
61INCLUDE = \
62    -I. @V_INCLUDES@ \
```

and replace with

CC = gcc-4.8

CPP = g++-4.8



```
41# Pathname of directory to install the man page
42MANDEST = @mandir@
43# Define datarootdir as of autoconf 2.60
44datarootdir = @datarootdir@
45
46CC = gcc-4.8
47CPP = g++-4.8
48CCOPT = @V_CCOPT@
49MKDEP = ./conf/mkdep
50# Have to be the same as that defined in conf/makefile.win
51TCL2C = @V_TCL2CPP@
52TCLSH = @V_TCLSH@
53
54#
55# Remember to add a dependency if you add any tcl sources here.
56#
57LIB = \
58    @V_LIBS@ \
59    @V_LIB_X11@ \
60    @V_LIB@ -lm @LIBS@
61INCLUDE = \
62    -I. @V_INCLUDES@ \
```

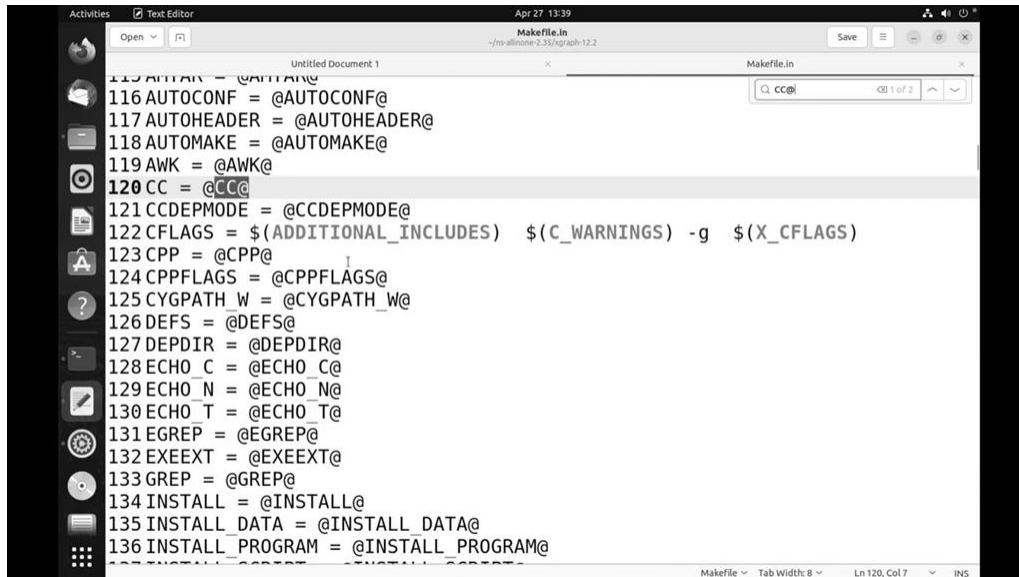
Save file and close

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9.4: open `ns-allinone-2.35/xgraph-12.2/Makefile.in` file find this

`CC = @CC@`

`CPP = @CPP@`

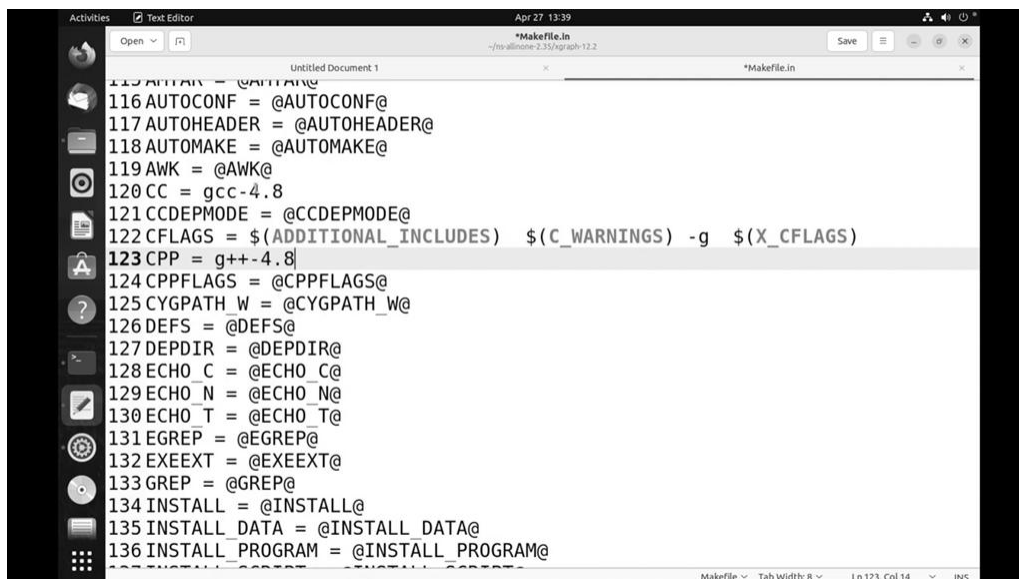


```
115 PREFIX = @PREFIX@
116 AUTOCONF = @AUTOCONF@
117 AUTOHEADER = @AUTOHEADER@
118 AUTOMAKE = @AUTOMAKE@
119 AWK = @AWK@
120 CC = @CC@
121 CCDEPMODE = @CCDEPMODE@
122 CFLAGS = $(ADDITIONAL_INCLUDES) $(C_WARNINGS) -g $(X_CFLAGS)
123 CPP = @CPP@
124 CPPFLAGS = @CPPFLAGS@
125 CYGPATH_W = @CYGPATH_W@
126 DEFS = @DEFS@
127 DEPDIR = @DEPDIR@
128 ECHO_C = @ECHO_C@
129 ECHO_N = @ECHO_N@
130 ECHO_T = @ECHO_T@
131 EGREP = @EGREP@
132 EXEEXT = @EXEEXT@
133 GREP = @GREP@
134 INSTALL = @INSTALL@
135 INSTALL_DATA = @INSTALL_DATA@
136 INSTALL_PROGRAM = @INSTALL_PROGRAM@
```

and replace with

`CC = gcc-4.8`

`CPP = g++-4.8`



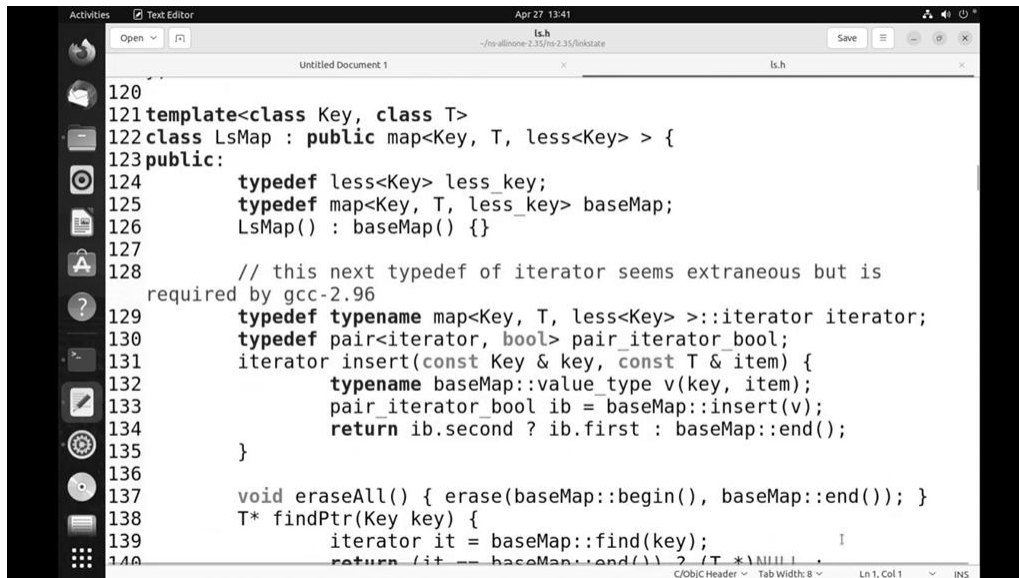
```
115 PREFIX = @PREFIX@
116 AUTOCONF = @AUTOCONF@
117 AUTOHEADER = @AUTOHEADER@
118 AUTOMAKE = @AUTOMAKE@
119 AWK = @AWK@
120 CC = gcc-4.8
121 CCDEPMODE = @CCDEPMODE@
122 CFLAGS = $(ADDITIONAL_INCLUDES) $(C_WARNINGS) -g $(X_CFLAGS)
123 CPP = g++-4.8
124 CPPFLAGS = @CPPFLAGS@
125 CYGPATH_W = @CYGPATH_W@
126 DEFS = @DEFS@
127 DEPDIR = @DEPDIR@
128 ECHO_C = @ECHO_C@
129 ECHO_N = @ECHO_N@
130 ECHO_T = @ECHO_T@
131 EGREP = @EGREP@
132 EXEEXT = @EXEEXT@
133 GREP = @GREP@
134 INSTALL = @INSTALL@
135 INSTALL_DATA = @INSTALL_DATA@
136 INSTALL_PROGRAM = @INSTALL_PROGRAM@
```

Save file and close

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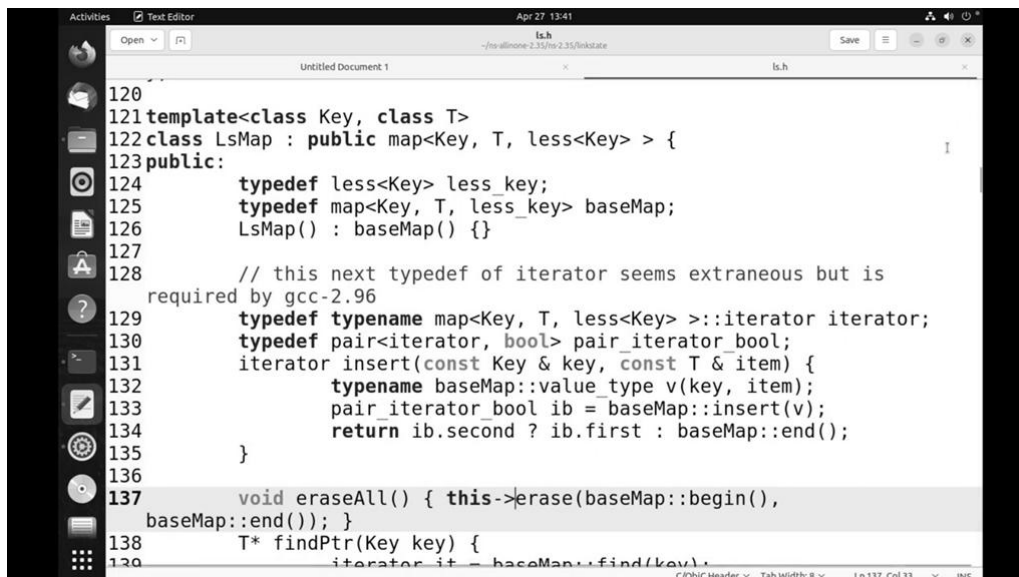
9.5: open file **ns-allinone-2.35/ns-3.35/linkstate/ls.h** and goto line no **137**.

- change the line **erase** to **this->erase**



```
120
121 template<class Key, class T>
122 class LsMap : public map<Key, T, less<Key> > {
123 public:
124     typedef less<Key> less_key;
125     typedef map<Key, T, less_key> baseMap;
126     LsMap() : baseMap() {}
127
128     // this next typedef of iterator seems extraneous but is
    required by gcc-2.96
129     typedef typename map<Key, T, less<Key> >::iterator iterator;
130     typedef pair<iterator, bool> pair_iterator_bool;
131     iterator insert(const Key & key, const T & item) {
132         typename baseMap::value_type v(key, item);
133         pair_iterator_bool ib = baseMap::insert(v);
134         return ib.second ? ib.first : baseMap::end();
135     }
136
137     void eraseAll() { erase(baseMap::begin(), baseMap::end()); }
138     T* findPtr(Key key) {
139         iterator it = baseMap::find(key);
140         return (it == baseMap::end()) ? (T *)NULL : it->second;
```

Replace with



```
120
121 template<class Key, class T>
122 class LsMap : public map<Key, T, less<Key> > {
123 public:
124     typedef less<Key> less_key;
125     typedef map<Key, T, less_key> baseMap;
126     LsMap() : baseMap() {}
127
128     // this next typedef of iterator seems extraneous but is
    required by gcc-2.96
129     typedef typename map<Key, T, less<Key> >::iterator iterator;
130     typedef pair<iterator, bool> pair_iterator_bool;
131     iterator insert(const Key & key, const T & item) {
132         typename baseMap::value_type v(key, item);
133         pair_iterator_bool ib = baseMap::insert(v);
134         return ib.second ? ib.first : baseMap::end();
135     }
136
137     void eraseAll() { this->erase(baseMap::begin(),
    baseMap::end()); }
138     T* findPtr(Key key) {
139         iterator it = baseMap::find(key);
```

Save and close

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Step10: After change is made open terminal and open ns-allinone-2.35 folder in terminal and just type `./install` for installation of ns2 source file.

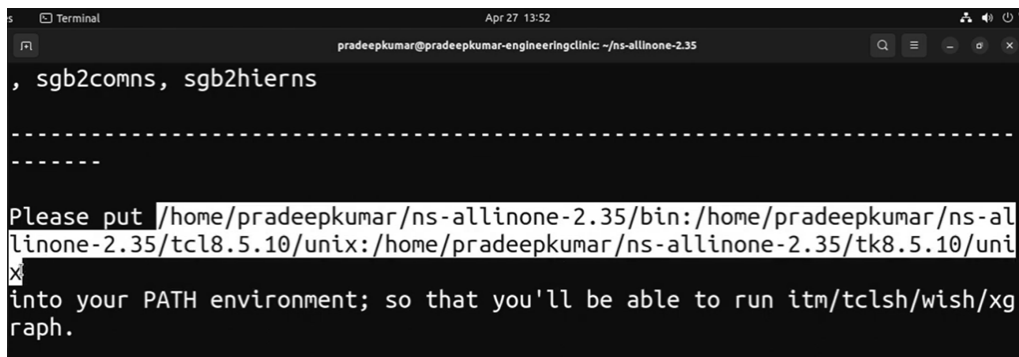
Step11: After installation is completed we need to set path of ns2 but don't close terminal it is needed for set path.

11.1: open `.bashrc` file for that first you go to root dir after that run this command.

sudo gedit .bashrc

11.2: After open file copy path from terminal that show below image but thing you have remember your path may be different not copy from this document it's for example purpose.

home/username/Downloads/ns-allinone-2.35/bin:/home/username/Downloads/ns-allinone-2.35/tcl8.5.10/unix:/home/username/Downloads/ns-allinone-2.35/tk8.5.10/unix

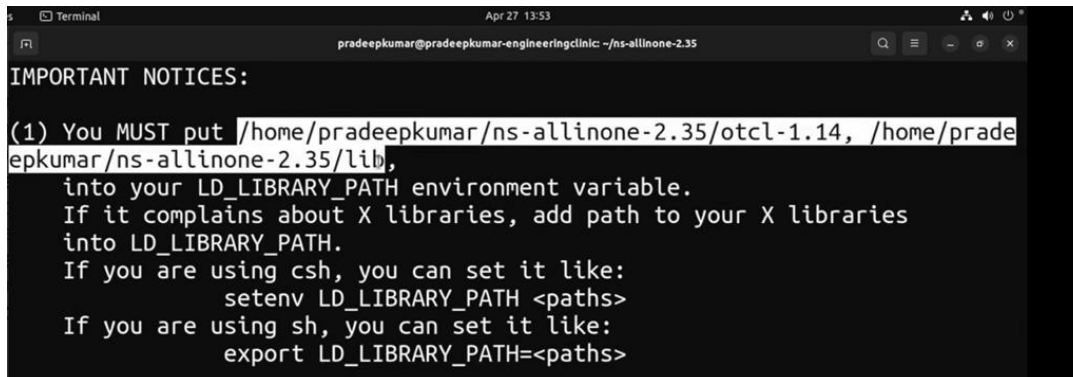
A terminal window titled 'Terminal' with a timestamp of 'Apr 27 13:52'. The user is 'pradeepkumar' and the directory is '~/ns-allinone-2.35'. The terminal shows the command `, sgb2comns, sgb2hierns` followed by a dashed line separator. Below the separator, a text box highlights the path `/home/pradeepkumar/ns-allinone-2.35/bin:/home/pradeepkumar/ns-allinone-2.35/tcl8.5.10/unix:/home/pradeepkumar/ns-allinone-2.35/tk8.5.10/unix`. The text below the path says: 'Please put [path] into your PATH environment; so that you'll be able to run itm/tclsh/wish/xgraph.'

`export PATH=$PATH:/home/username/Downloads/ns-allinone-2.35/bin:/home/username/Downloads/ns-allinone-2.35/tcl8.5.10/unix:/home/username/Downloads/ns-allinone-2.35/tk8.5.10/unix`

after copy path goto `.bashrc` file and write `export PATH=$PATH:(past your copied path)`

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11.3: copy LD_LIBRARY_PATH path from terminal that show below image
/home/username/Downloads/ns-allinone-2.35/otcl-1.14:/home/username/Downloads/ns-allinone-2.35/lib



```
Terminal
pradeepkumar@pradeepkumar-engineeringclinic: ~/ns-allinone-2.35

IMPORTANT NOTICES:

(1) You MUST put /home/pradeepkumar/ns-allinone-2.35/otcl-1.14, /home/pradeepkumar/ns-allinone-2.35/lib,
into your LD_LIBRARY_PATH environment variable.
If it complains about X libraries, add path to your X libraries
into LD_LIBRARY_PATH.
If you are using csh, you can set it like:
    setenv LD_LIBRARY_PATH <paths>
If you are using sh, you can set it like:
    export LD_LIBRARY_PATH=<paths>
```

```
export LD_LIBRARY_PATH=/home/username/Downloads/ns-allinone-2.35/otcl-1.14:/home/username/Downloads/ns-allinone-2.35/lib
```

after copy path goto .bashrc file and write export LD_LIBRARY_PATH=(past your copied path)

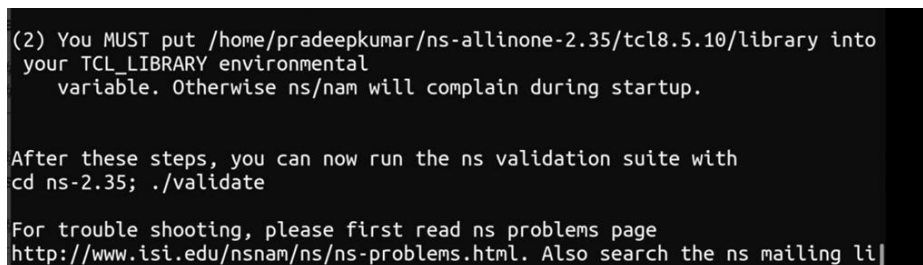
after past it replace , (coma) with : (colon)

```
export LD_LIBRARY_PATH=/home/username/Downloads/ns-allinone-2.35/otcl-1.14,
/home/username/Downloads/ns-allinone-2.35/lib
```

replace with : (colon)

```
export LD_LIBRARY_PATH=/home/username/Downloads/ns-allinone-2.35/otcl-1.14:/home/username/Downloads/ns-allinone-2.35/lib
```

11.4: copy TCL_LIBRARY path from terminal that show below image
/home/username/Downloads/ns-allinone-2.35/tcl8.5.10/library



```
(2) You MUST put /home/pradeepkumar/ns-allinone-2.35/tcl8.5.10/library into
your TCL_LIBRARY environmental
variable. Otherwise ns/nam will complain during startup.

After these steps, you can now run the ns validation suite with
cd ns-2.35; ./validate

For trouble shooting, please first read ns problems page
http://www.isi.edu/nsnam/ns/ns-problems.html. Also search the ns mailing li
```

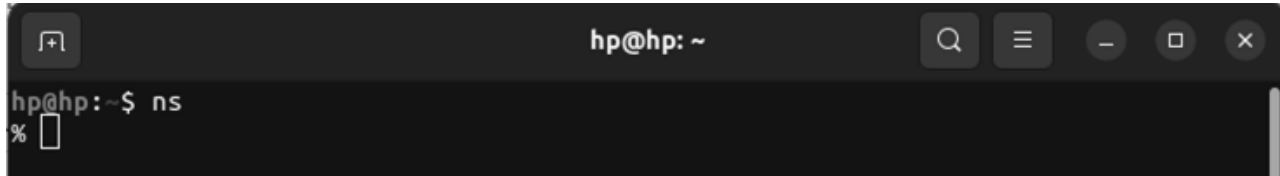
```
export TCL_LIBRARY=/home/username/Downloads/ns-allinone-2.35/tcl8.5.10/library
```

after copy path goto .bashrc file and write export TCL_LIBRARY=(past your copied path)

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Step12: After path set complete install ns2 by using this command
sudo apt install ns2

after ns2 installed check it is working or not type **ns** in terminal if we get **%** that mean ns2 working fine.



```
hp@hp: ~  
hp@hp:~$ ns  
% 
```

Step13: Install **nam** by using this command.
sudo apt install nam

after nam installed check it is working or not type **nam** in terminal if network animator is open that mean **nam** is working fine

if **nam** install successful but not open just display **nam**: follow the solution below.

13.1: First remove/uninstall current **nam** by using this command.
sudo apt remove nam

13.2: Download **nam_1.14** file from this link give below. Download **nam_1.14** file as per your system configuration.

<https://www.linuxquestions.org/questions/linux-newbie-8/ns-stop-couldn-t-execute-nam-permission-denied-while-executing-exec-nam-4175524760/#2>

in my case my system is **amd64** so i can download **nam_1.14_amd64.deb** file

- After download is completed just install it.
- Just open with Software Install and click install.
- After installation is complete just check it is working or not in most case it working fine.

