# CS542 Project User Manual

## (Link State Routing Simulator)

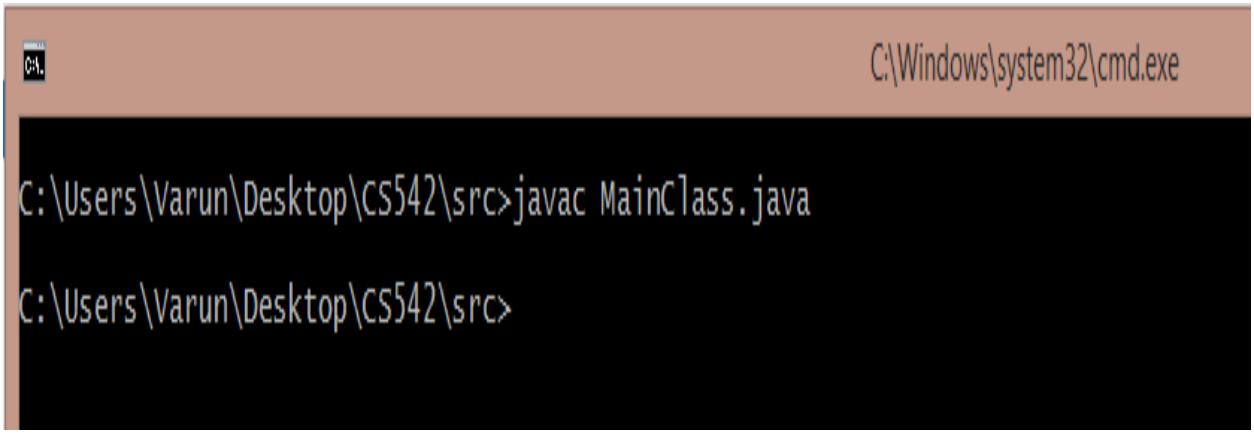
Name – FNU, Varun Kumar

CWID – A20365139

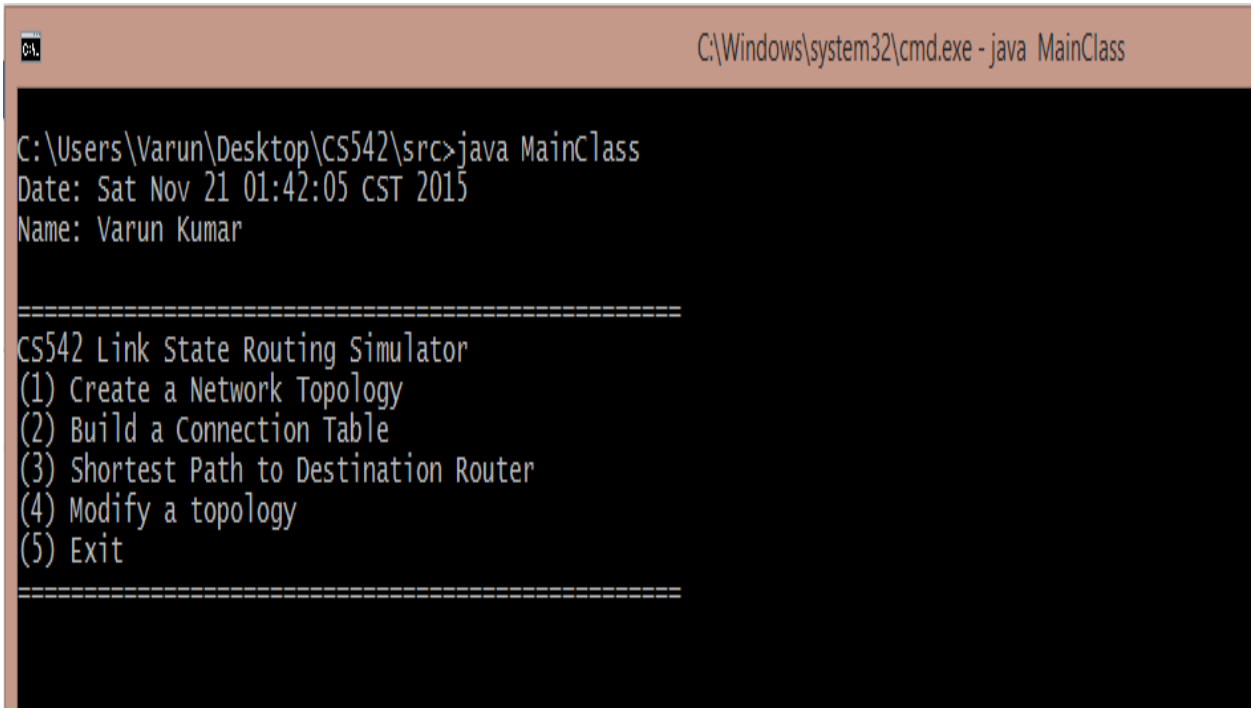
Section - 02

**Step 1: Compile** and build the Source Code (all java Files)

Please open command prompt then go to **src** directory and compile the compile the java code as below:




**Step 2:** After Successful Compilation, **Run** java Code as below:



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**A20365139**

## How to run executable Jar File:

### Step 3: Create Network Topology

From the Menu perform different operations, First of all create network topology.

Choose option 1 - it will read matrix data from text file and will create network topology matrix table.

Note: Make sure network topology file should be present in **src** directory.

```
================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
================================================
1
Input original network topology matix data file:
input.txt
Review original topology matrix: [Matrix Table]
0       4       -1      -1      -1      -1      -1      8       -1

4       0       8       -1      -1      -1      -1      11      -1

-1      8       0       7       -1      4       -1      -1      2

-1      -1      7       0       9       14      -1      -1      -1

-1      -1      -1      9       0       10      -1      -1      -1

-1      -1      4       14      10      0       2       -1      -1

-1      -1      -1      -1      -1      2       0       1       6

8       11      -1      -1      -1      -1      1       0       7

-1      -1      2       -1      -1      -1      6       7       0
```

**Step 4:** Build Connection Table for a Router.

Enter option 2 to build the connection table and then select router.

```
================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
================================================
2
Select a source router:
1
  Router 1 Connection Table
  Destination     Interface
=======================================
   Router 1       -
   Router 2       2
   Router 3       2
   Router 4       2
   Router 5       8
   Router 6       8
   Router 7       8
   Router 8       8
   Router 9       2
```

**Step 5: Find Shortest Path to a destination router.**

Choose option 3 then enter the destination router. It will display shortest path from source to destination router and the total cost value.

```
================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
================================================
3
Select the destination router:
9
The shortest path from 1 to 9 is ::  1 -->  2 -->  3 -->  9
The total cost is: 14
```

**Step 6: Modify a network topology.**

Choose option 4 then select a router to which you want to shut down (remove). After modification select source and destination router, it will display updated connection table, shortest path from source to destination router and the total cost value.

```
================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
================================================
4

Select a Router to be Removed
9
Updated Matrix Table:
0       4       -1      -1      -1      -1      -1      8       -1
4       0       8       -1      -1      -1      -1      11      -1
-1      8       0       7       -1      4       -1      -1      -1
-1      -1      7       0       9       14      -1      -1      -1
-1      -1      -1      9       0       10      -1      -1      -1
-1      -1      4       14      10      0       2       -1      -1
-1      -1      -1      -1      -1      2       0       1       -1
8       11      -1      -1      -1      -1      1       0       -1
-1      -1      -1      -1      -1      -1      -1      -1      -1
```

```
Select a source router:
1
  Router 1 Connection Table
  Destination     Interface
=======================================
   Router 1       -
   Router 2       2
   Router 3       2
   Router 4       2
   Router 5       8
   Router 6       8
   Router 7       8
   Router 8       8

Select the destination router:
8
The shortest path from 1 to 8 is ::  1 -->  8
The total cost is: 8
```

## Step 7: Exit from Project.

```
==================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
==================================================
5
 Exit CS542 project. Good Bye!

C:\Users\Varun\workspace\CS542\src>
```

## Extra credit: Implemented Routing algorithm which supports Extra features as below:

- **Minimum initial number of nodes: 8 - implemented and working fine.**
  It supports for more than 8 nodes.

- **Create a connection table of each node as default and display all - implemented and working fine.**
  This project is generating all connection table of each node and displaying properly.

```
C:\Windows\system32\cmd.exe - java  MainClass

C:\Users\Varun\workspace\CS542\src>java MainClass
==================================================
CS542 Link State Routing Simulator
(1) Create a Network Topology
(2) Build a Connection Table
(3) Shortest Path to Destination Router
(4) Modify a topology
(5) Exit
==================================================
1
Input original network topology matix data file:
input.txt
Review original topology matrix: [Matrix Table]
0       4       -1      -1      -1      -1      -1      8       -1
4       0       8       -1      -1      -1      -1      11      -1
-1      8       0       7       -1      4       -1      -1      2
-1      -1      7       0       9       14      -1      -1      -1
-1      -1      -1      9       0       10      -1      -1      -1
-1      -1      4       14      10      0       2       -1      -1
-1      -1      -1      -1      -1      2       0       1       6
8       11      -1      -1      -1      -1      1       0       7
-1      -1      2       -1      -1      -1      6       7       0
```

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**A20365139**

```
  Router 1 Connection Table
  Destination      Interface
=======================================
   Router 1        -
   Router 2        2
   Router 3        2
   Router 4        2
   Router 5        8
   Router 6        8
   Router 7        8
   Router 8        8
   Router 9        2

  Router 2 Connection Table
  Destination      Interface
=======================================
   Router 2        -
   Router 1        1
   Router 3        3
   Router 4        3
   Router 5        3
   Router 6        3
   Router 7        8
   Router 8        8
   Router 9        3

  Router 3 Connection Table
  Destination      Interface
=======================================
   Router 3        -
   Router 1        2
   Router 2        2
   Router 4        4
   Router 5        6
   Router 6        6
   Router 7        6
   Router 8        6
   Router 9        9
```

```
  Router 4 Connection Table
  Destination      Interface
=======================================
   Router 4        -
   Router 1        3
   Router 2        3
   Router 3        3
   Router 5        5
   Router 6        3
   Router 7        3
   Router 8        3
   Router 9        3

  Router 5 Connection Table
  Destination      Interface
=======================================
   Router 5        -
   Router 1        6
   Router 2        6
   Router 3        6
   Router 4        4
   Router 6        6
   Router 7        6
   Router 8        6
   Router 9        6

  Router 6 Connection Table
  Destination      Interface
=======================================
   Router 6        -
   Router 1        7
   Router 2        3
   Router 3        3
   Router 4        3
   Router 5        5
   Router 7        7
   Router 8        7
   Router 9        3
```

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```
  Router 7 Connection Table
  Destination      Interface
=======================================
    Router 7       -
    Router 1       8
    Router 2       8
    Router 3       6
    Router 4       6
    Router 5       6
    Router 6       6
    Router 8       8
    Router 9       9

  Router 8 Connection Table
  Destination      Interface
=======================================
    Router 8       -
    Router 1       1
    Router 2       2
    Router 3       7
    Router 4       7
    Router 5       7
    Router 6       7
    Router 7       7
    Router 9       9

  Router 9 Connection Table
  Destination      Interface
=======================================
    Router 9       -
    Router 1       3
    Router 2       3
    Router 3       3
    Router 4       3
    Router 5       3
    Router 6       3
    Router 7       7
    Router 8       8
```

**Network Topology:**