

```
dir_name="NOVU_0"
nw_file="./$dir_name/novu_0.nsa"
```

```
#nnode: number of nodes in the network
nnode=5000
```

```
#alpha: if 1, then only the edge weights will be used i.e. the global importance of nodes will not be used.
alpha=1
```

```
#maxk: Number of columns you want to use in laplacian matrix. Maximum value could be the nnode.
#k1: number of communities you want to have
#k2: number of communities you want to have
maxk=500
k1=15
k2=15
```

```
#op1: weighted adjacency matrix
#op2: for running maximal clique finding algorithm mentioned below (step 2)
#op3: page rank score of the nodes
#op4: file containing maximal clique information
#op6: betweenness scores of the nodes
#op7: normalized laplacian matrix containing maxk number of columns
op1="ori_weight.txt"
op2="edge_list.txt"
op3="pr_score.txt"
op4="clq.txt"
op5="cl_adj.txt"
op6="bwsc_node.txt"
op7="lap_mat.txt"
```

```
#required to run maximal clique finding algorithm mentioned below (step 2)
ip="./$dir_name/"$op2
op="./$dir_name/clq.txt"
```

```
#Step 1:
Rscript --vanilla source_code_P1.R $dir_name $nw_file $op1 $op2 $op3
```

```
#Step 2:
#finding maximal cliques in sparse networks can be done using Quick Cliques:
#Listing All Maximal Cliques in Large Sparse Real-World Graphs in Near-Optimal Time, D. Eppstein,
M. Löffler, and D. Strash, Journal of Experimental Algorithmics, 18 (3): 3.1, 2013,
doi:10.1145/2543629
#use --input-file=$ip and output file $op
```

```
#Step 3:
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```
gcc -o step_12345 step_12345.c -lm  
./step_12345 $nnode $dir_name $op1 $op3 $op4 $alpha $op5
```

#Step 4:

```
Rscript --vanilla source_code_P2.R $dir_name $maxk $op5 $nw_file $op6 $op7
```

#Step 5:

```
gcc -o comm_algo comm_algo.c -lm  
./comm_algo $nnode $maxk $k1 $k2 $dir_name $op7 $op6 $nw_file
```

#community membership file (comm.txt) vector will be generated in \$dir_name directory