Q1. If you are connected to the SOC’s Plug and Play network through wireless or wired connection, or to a PC in a programming lab, find out the following.

a. The DHCP server address
b. DNS server(s) address
c. Default Gateway address
d. The lease time given by the DHCP server

Q2. Understanding DNS through nslookup (Please note that you have to work yourself on this to get a good understanding of how DNS functions).

a. The nslookup command is a program that is used to query Internet domain name servers (DNS). DNSs are distributed databases that provide mapping between domain names and IP addresses. The nslookup command is available on most of the systems.

Type /usr/sbin/nslookup at sunfire prompt. Type the following command,

> set qu=ns
> comp.nus.edu.sg.

Find out all the name servers in SOC.

Find the number of name servers maintained by Microsoft and Singapore Polytechnic. What are your observations?

b. Set query to SOA record and type comp.nus.edu.sg to find out the email address of the system administrator and identify the primary name server of SOC. Type microsoft.com and find out the differences in SOA record settings between the two. What is the minimum time for which SOC’s name server will cache www.microsoft.com address? How about Singapore Polytechnic name server?

c. Set query to AAAA (IPv6 records) and find the IPv6 address of www.kame.net.

d. Set query to A records and find the IP addresses of web server of school of computing and the host “pasta”. [Set qu=a]

e. DNSs also provides reverse mapping. Find out the domain names of 192.168.1.48 and 137.132.90.56 [Set qu=PTR]

f. You can make nslookup function like a nameserver. The difference in operation between a resolver and a name server is that the resolver implements the search list and the name server doesn’t. By
default, nslookup appends the domains in the search list to names that don’t end in a dot. In addition resolver requests recursive services and name servers seldom do. They select each name server referral one by one. In this example, try to make nslookup (resolver) emulate the behavior of a name server by turning off recursion and search.

i) Using *nslookup* execute the following commands,

```
> set norec
> set nosearch
> set type=ns
> .
```

Find out what these commands do *(refer to man nslookup)*
Find all the top level domain name servers and their IP addresses. How many top level servers also resolve names to IPv6 addresses?

ii) Now select one of the root servers by issuing the command

```
> server name-of-a-root-server
```

iii) Now try to resolve *www.smu.edu.sg* by issuing the query

```
> www.smu.edu.sg
```

What does the query display?

iv) Now select the first server in the list by issuing the command

```
server name of the server.
```

v) Now try to resolve *www.smu.edu.sg* by issuing the query

```
> www.smu.edu.sg
```

What does the query display?

vi) Repeat this until you get a name server for smu.edu.sg domain.

vii) Then set that name server’s address and set query type=A and resolve the address of *www.smu.edu.sg*.

What is the IP address of *www.smu.edu.sg*? What is its canonical name?

viii) Verify this address by setting the server to ns1.comp.nus.edu.sg and resetting recursion and search by issuing the following commands

```
server ns1.comp.nus.edu.sg.
set rec
set search
www.smu.edu.sg
```