SE424: Distributed Systems	**Recitation 7**
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Domain Name System Resolution

Today we will play around a bit with the DNS resolving tools called `nslookup` and `dig`.

1 Domain Name System

We have discussed the fundamentals of the Domain Name System (DNS) in class. There are a large number of copies of the `roots` which contain the basic information for finding all of the top level domains. There are about 1500 top level domains as well as some special domains which are used for specific tasks.

`example.com, example.net` The domains are reserved for example URLs and will never be sold to anyone

`in-addr.arpa` Used for mapping IP addresses back to names. Example: `moodle85.kinneret.ac.il` → 212.150.112.47, `47.112.150.212.in-addr.arpa` → `ip47.kinneret.ac.il`

We saw how to use `nslookup` in class, so today we'll see a slightly more modern tool - `dig`.

2 nslookup

`nslookup` is an older tool used for DNS lookup. It's a DNS client program found in Windows and Linux. As a review of using `nslookup`, let's perform the following steps.

1. Use `nslookup` to find the IP addresses of `www.illinois.edu`. What is it?

2. In the previous query, you used `nslookup` to ask for the IP address of `www.illinois.edu` without specifying any particular name server. Notice that the response included the line "non-authoritative response". Who responded to the query? Why does the response include a warning that it's not authoritative?

3. Use `nslookup` tool to discover the name servers responsible for `www.illinois.edu`. There are 3 of them. Use the `-type=NS` option to request name server responses. Write down the name server names and IP addresses.

4. Use `nslookup` to ask one of the `illinois.edu` name servers for the IP address for `www.illinois.edu`. The response should not include the "non-authoritative" line.

5. Try the above steps for the domain `mit.edu` and the website `www.mit.edu`. Why are the domains and IP addresses so different for the two domains?

3 About dig

`dig` is a Linux based tool which lets you perform a bunch of operations on DNS servers which are more complicated to do using `nslookup`. We'll perform the following operations using `dig` in class and see what the results are:

1. `dig`

2. `dig kinneret.ac.il`

3. Open the URL `https://apps.db.ripe.net/db-web-ui/#/query?searchtext=88.218.117.88` and see who is in charge of 88.218.117.88

4. `dig my.kinneret.ac.il`

5. Open the URL `https://whois.arin.net/rest/net/NET-104-16-0-0-1/pft?s=104.22.3.77` and see who is in charge of 104.22.3.77

6. `dig +short my.kinneret.ac.il`

7. `dig kinneret.ac.il ns`

8. `dig +short kinneret.ac.il ns`

9. `dig +trace kinneret.ac.il`

10. `dig 52.112.150.212.in-addr.arpa`

11. `dig 88.117.218.88.in-addr.arpa`