PA1: DNS Server Implementation

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Lab Time：Thursday 10:20 a.m. to 12:10 p.m.

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You can follow these steps to test the function of LocalDNSServer.

Network Information

Use `ipconfig` to get the ip addresss of my computer:

We can get the ip address is `10.26.128.169`

Execute `LocalDNSServer.py`

Type the following in the directory of `LocalDNSServer.py`

```
python3 LocalDNSServer.py
```

and input these in the command line:

```
10.26.128.169
55
```

Like this:

```
D:\PycharmProjects\CS305\PA1>python3 LocalDNSServer.py
Enter your ip: 10.26.128.169
Enter your port: 55
202.12.27.33
m.root-servers.net.
```

Tests on the document

www.baidu.com

Open another terminal, and type this in the command line:

```
dig @127.0.0.1 www.baidu.com a -p 5533
```

And here is the result.

```
D:\PycharmProjects\CS305\PA1>dig @127.0.0.1 www.baidu.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.baidu.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 10230
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.baidu.com.                  IN      A

;; ANSWER SECTION:
www.a.shifen.com.       1200    IN      A       182.61.200.6

;; Query time: 549 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:17:56 ;; MSG SIZE  rcvd: 60


D:\PycharmProjects\CS305\PA1>
```

Notice that there may be a bug that in the answer section, the CNAME field is not added into the result. (I tried my best to fix it, but did not succeed)

www.sina.com

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.sina.com a -p 5533
```

```
D:\PycharmProjects\CS305\PA1>dig @127.0.0.1 www.sina.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.sina.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 31182
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.sina.com.                    IN      A

;; ANSWER SECTION:
spool.grid.sinaedge.com. 60      IN      A       58.205.212.21

;; Query time: 1312 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:22:19 ;; MSG SIZE  rcvd: 66
```

www.sustech.edu.cn

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.sustech.edu.cn a -p 5533
```

```
D:\PycharmProjects\CS305\PA1>dig @127.0.0.1 www.sustech.edu.cn a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.sustech.edu.cn a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41786
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.sustech.edu.cn.            IN      A

;; ANSWER SECTION:
sustech.edu.cn.         3600    IN      A       172.18.1.3

;; Query time: 4313 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:23:46 ;; MSG SIZE  rcvd: 52
```

www.bilibili.com

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.bilibili.com a -p 5533
```

```
D:\PycharmProjects\CS305\PA1>dig @127.0.0.1 www.bilibili.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.bilibili.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 21477
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.bilibili.com.              IN      A

;; ANSWER SECTION:
g.w.bilicdn1.com.        180    IN      A       8.134.50.24

;; Query time: 480 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:24:53 ;; MSG SIZE  rcvd: 63
```

www.github.com

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.github.com a -p 5533
```

```
D:\PycharmProjects\CS305\PA1>dig @127.0.0.1 www.github.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.github.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7921
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.github.com.                                    IN      A

;; ANSWER SECTION:
github.com.                 3600     IN      A        20.205.243.166

;; Query time: 713 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:25:37 ;; MSG SIZE  rcvd: 48
```

www.baidu.com again(Read cache)

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.baidu.com a -p 5533
```

```
C:\Users\16011>dig @127.0.0.1 www.baidu.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.baidu.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 14012
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.baidu.com.                          IN      A

;; ANSWER SECTION:
www.baidu.com.              1200     IN      CNAME    www.a.shifen.com.
www.a.shifen.com.           1200     IN      A        182.61.200.6

;; Query time: 0 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:29:19 ;; MSG SIZE  rcvd: 74
```

Please notice that when reading cacahe, the CNAME type can be displayed correctly.

And here is the result in the terminal of `LocalDNSServer.py` :

```
C:\Windows\System32\cmd.exe - python3 LocalDNSServer.py
Microsoft Windows [版本 10.0.19042.1586]
(c) Microsoft Corporation。保留所有权利。

D:\PycharmProjects\CS305\PA1>python3 LocalDNSServer.py
Enter your ip: 10.26.128.169
Enter your port: 55
202.12.27.33
m.root-servers.net.
read from cache
```

www.baidu114514.com (a domain name cannot be queried)

Continue using the terminal in the previous section and type:

```
dig @127.0.0.1 www.baidu114514.com a -p 5533
```

```
C:\Users\16011>dig @127.0.0.1 www.baidu114514.com a -p 5533

; <<>> DiG 9.16.27 <<>> @127.0.0.1 www.baidu114514.com a -p 5533
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45436
;; flags: qr rd ad; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 0
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;www.baidu114514.com.                IN      A

;; Query time: 359 msec
;; SERVER: 127.0.0.1#5533(127.0.0.1)
;; WHEN: Wed Mar 30 20:48:15 ;; MSG SIZE  rcvd: 37
```

```
Microsoft Windows [版本 10.0.19042.1586]
(c) Microsoft Corporation。保留所有权利。

D:\PycharmProjects\CS305\PA1>python3 LocalDNSServer.py
Enter your ip: 10.26.128.169
Enter your port: 55
202.12.27.33
m.root-servers.net.
read from cache
this server cannot be accessed.
```