**Exercise 3**

图片包含 屏幕截图

描述已自动生成

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Question 1:

The status code is 200, the phrase is “OK”.

Question 2:

The HTML ﬁle was last modiﬁed at Tue, 23 Sep 2003 05:29:00 GMT.

The Date header is Tue, 23 Sep 2003 05:29:50 GMT

The Last modiﬁed ﬁeld is the time when the HTML ﬁle was last modiﬁed at the origin server and the Date ﬁeld is when the response was last sent.

Question 3:

The connection is persistent because the Connection header is “Keep-Alive”.

The Connection general header controls whether or not the network connection stays open after the current transaction finishes. If the value sent is keep-alive, it indicates that the client would like to keep the connection open.

Question 4:

According to content-length header, there are 73 bytes content returned to the browser.

Question 5:

It contains a HTML text file:

1. **<html>**\n
2. Congratulations.  You've downloaded the file lab2-1.html!\n
3. **</html>**\n

**Exercise 4**

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Question1:

No, there is no “IF-MODIFIED-SINCE” ﬁeld in the first HTTP GET request.

Question2:

Yes, it’s Tue, 23 Sep 2003 05:35:00 GMT.

Question3:

Yes, the lines:

1. If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT
2. If-None-Match: "1bfef-173-8f4ae900"

The “IF-MODIFIED-SINCE” ﬁeld tells the last modiﬁed date of the requested resource and it makes the request conditional: the server will send back the requested resource, with a 200 status, only if it has been last modified after the given date. If the request has not been modified since, the response will be a 304 without any body.

The “IF-NONE-MATCH” ﬁeld tells us the Etag of a specific version of a resource and it makes the request conditional. For GET and HEAD methods, the server will send back the requested resource, with a 200 status, only if it doesn't have an ETag matching the given ones. For other methods, the request will be processed only if the eventually existing resource's ETag doesn't match any of the values listed.

Question4:

The status code is 304 and phrase is Not Modified.

The server did not return the contents of the ﬁle.

Because the request is conditional and the server will send back the requested resource, with a 200 status, only if it has been last modified after the given date. If the request has not been modified since, the response will be a 304 without any body.

Question5:

The value of the Etag field in the 2nd response message is "1bfef-173-8f4ae900" and it is the same as the ﬁrst response.

The If-None-Match HTTP request header makes the request conditional. For GET and HEAD methods, the server will send back the requested resource, with a 200 status, only if it doesn't have an ETag matching the given ones. For other methods, the request will be processed only if the eventually existing resource's ETag doesn't match any of the values listed.

**Exercise 5**

1. #!/usr/bin/python
3. **import** socket
4. **import** sys
5. **import** datetime
7. **def** main():
8. **if** len(sys.argv) != 3:
9. **print**("Parameters ERROR!")
10. sys.exit(1)
12. addr = (sys.argv[1], int(sys.argv[2]))
13. rtts = []
15. **for** i **in** range(10):
16. client = socket.socket(socket.AF\_INET, socket.SOCK\_DGRAM)
17. client.settimeout(1)
18. send\_time = datetime.datetime.now()
19. client.sendto("PING {} {} \r\n".format(i, send\_time).encode(), addr)
21. **try**:
22. resp\_data, server\_addr = client.recvfrom(2048)
23. rtt = round(((datetime.datetime.now() - send\_time).total\_seconds() \* 1000))
24. rtts.append(rtt)
25. **print**('ping to {}, seq = {}, rtt = {} ms'.format(addr[0], i, rtt))
26. **except** socket.timeout:
27. **print**('ping to {}, seq = {}, time out'.format(addr[0], i))
29. **if** len(rtts) != 0:
30. **print**('round-trip min/avg/max = {}/{}/{} ms'.format(min(rtts), sum(rtts)/len(rtts), max(rtts)))
31. **else**:
32. **print**('All of 10 packages are lost')
34. **if** \_\_name\_\_ == "\_\_main\_\_":
35. main()