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CSE 310

Programming Assignment #1

<div align="center">README</div>

Introduction:

The purpose of this code is to act as a DNS resolver, taking in domain names and returning corresponding IPv4 addresses, formatted similar to a prebuilt dig command run on another machine.

Libraries used:

- dns.resolver: The program uses dns.message.make_query() to create message objects, and dns.query.udp() to send those messages to an address given the set parameters.
- time: This library contains time.perf_counter(), which is used to find the start and end times of the resolution, the difference of which is used as queryTime.
- datetime: Using the datetime.now() function determines the exact date and time immediately after a request is inputted by the user.

Important variables:

- root: List of the root servers
- domain: User input for requested domain
- WHEN: The date and time of the request
- request: A message request created for domain
- question_section: Contains the question section from the request for output
- answer_section: List that compiles answers and necessary lines from the program for output
- start: The beginning of recording query time
- end: The end of recording query time
- queryTime: How much time it took to resolve the query

send_query(req, addr) function:

- A recursive function used to send queries using dns.query.udp() and eventually return answers, checking for cases when answer, additional, or authority sections are present, and also to resolve addresses which are not in IPv4 or A format (i.e CNAME).
- req: Input for request, takes message object
- addr: Input for address, converts to string

Output layout:

- "mydig": The precedent for user input
- "QUESTION SECTION": The header for the question line
- "ANSWER SECTION" The header for answer lines
- "Query time": corresponds to the value of queryTime
- "WHEN": corresponds to the value of WHEN

For examples containing the program's output, see mydig_output.txt.