**CODE DOCUMENTATION**

Introduction to Computer Communications  
Programming Assignment 2 - DNS Client

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**Running Instructions**

Running the program is as required in the assignment.

**Header File**

* Defines, includes and pragmas.
* **Struct header** - defines the fields of header part in DNS packet, according to RFC, ordered by byte.
* **Struct question** - defines the fields of question part in DNS packet, according to RFC (without QNAME).
* **Struct r\_data** - defines the fields of rdata part in resource record of DNS packet, according to RFC.
* **Struct res\_record** - defines the fields of resource record part in DNS packet, according to RFC.
* **Struct query** - defines the fields of query part in DNS packet, including QNAME and question.

**Main Flow**

* Parsing arguments and initializing Winsock.
* Creating socket and server address using **createSocketAndServerAddr** method
  + Creating socket.
  + Setting timeout to socket according to instructions.
  + Creating server address and setting server IP and port.
* Asking user for domain name. Lower-casing the input using **domainToLowercase** method.
* While user hasn't entered "quit":
  + Checking if the domain name is valid using **isDomainNameValid** method.

Validation is based on rules from <https://www.geeksforgeeks.org/how-to-validate-a-domain-name-using-regular-expression/> (checking length, legal characters, etc). If the name is not valid, printing relevant message to the user.

* + Sending a dnsQueryparsing the result into struct hostent\* using **dnsQuery** method.
    - Creating DNS query packet using **createDnsQueryPacket** method, by filling the relevant structs according to instructions.
    - Sending the query packet to socket using sendto and check the returned value for errors.
    - Receiving the answer packet from socket using recvfrom and check the returned value for errors and timeout.
    - Parsing the answer packet using **parseAnswerFromAnswerPacket** method and returning the result.
      * Continue
  + Printing the result (or results, see bonus part) and asking for another input.
* Closing socket, cleaning up Winsock and exits successfully.

**Bonus - Implementation for multiple addresses for the same domain name**

* Hereby listed the relevant additions and changes that were made to support multiple addresses for the same domain name:
  + Continue