Experiment No: 9	
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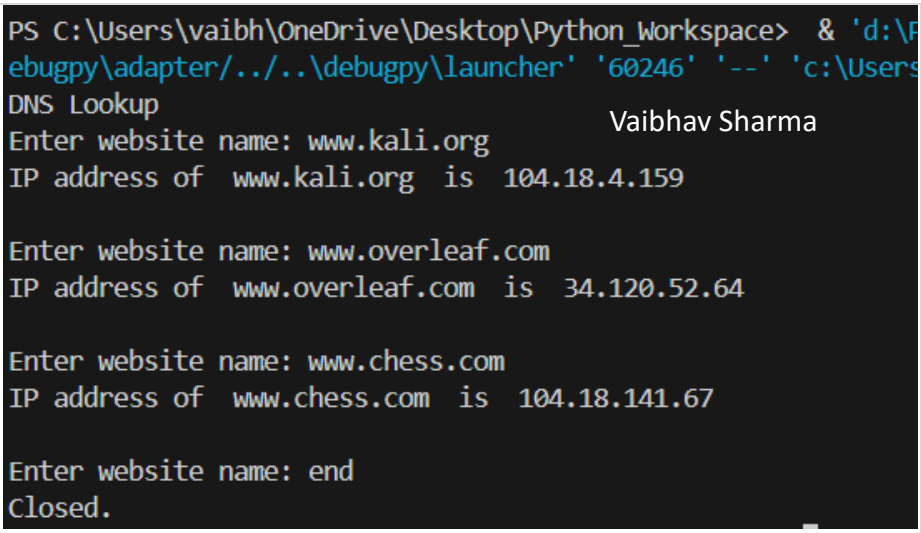
Title	Write a program that performs DNS Lookup
Theory (short)	**Domain Name System (DNS)** is a fundamental component of the internet that translates human-readable domain names (like www.google.com) into IP addresses (such as 142.250.190.14), which computers use to identify and communicate with each other. DNS functions like a phonebook for the internet, enabling users to access websites without needing to memorize complex numerical IP addresses. When a user types a URL into a browser, the DNS resolver sends a query to find the corresponding IP address by searching through a hierarchical network of servers, including root servers, top-level domain (TLD) servers, and authoritative name servers. DNS caching improves speed by storing recent lookups temporarily, but if a domain cannot be resolved, users encounter errors like DNS_PROBE_FINISHED_NXDOMAIN. Additionally, DNS plays a critical role in network security through protocols like DNSSEC (DNS Security Extensions), which protects against spoofing and cache poisoning attacks.
Program	``` import socket def dns_lookup(): print("DNS Lookup") link = "a" while link != "end": link = input("Enter website name: ") if link != "end": host = socket.gethostbyname(link) print("IP address of ", link, " is ", host, "\n") print("Closed.") if __name__ == "__main__": dns_lookup() ```

Output Screenshots	 Fig 1: Implementation of DNS lookup
Observation	**Successful DNS Resolution:** 1. The DNS lookup successfully resolved the domain names to their respective IP addresses: a. www.kali.org→ 104.18.4.159 b. www.overleaf.com→ 34.120.52.64 c. www.chess.com→ 104.18.141.67
Self-assessment Q&A	Q: What is the role of DNS in internet communication? Ans: DNS translates human-readable domain names into IP addresses, allowing computers to identify and communicate with servers without needing numerical IP addresses. Q: How does DNS caching improve lookup speed? Ans: DNS caching temporarily stores recent DNS lookups to avoid repeatedly querying DNS servers, speeding up the process of resolving domain names to IP addresses. Q: What security protocol does DNS use to prevent spoofing? Ans: DNS uses DNSSEC (DNS Security Extensions) to protect against spoofing and cache poisoning attacks by ensuring the authenticity of DNS data.
Conclusion	This DNS lookup program showed us how **DNS translates website names into IP addresses** to make browsing possible.