assignment2

my_ping module

my_ping.**calculate_checksum**(*data*)

Compute the ICMP checksum

Parameters: **data** – data to compute the checksum

Return checksum:

my_ping.**create_packet**(*identifier*, *seq*, *size*)

Create ICMP Echo Request packet

Parameters:

- **identifier** – unique id for the packet
- **seq** – sequence number for the packet
- **size** – size of the packet in bytes

Returns: returns the packet

my_ping.**main**()

Parse command-line arguments and initiate the ping process.

This function handles user input, resolves the target hostname to an IP address, and calls the *send_ping* function to perform the ICMP Echo Request. The user can specify the number of packets to send, the interval between packets, the payload size, and the timeout.

Command-line arguments:

- host: Target IP address or hostname to ping.
- -c: Number of packets to send.
- -i: Interval (in seconds) between packets (default is 1.0).
- -s: Payload size in bytes (default is 56).
- -t: Timeout in seconds for when the program terminates.

Returns: None

my_ping.**resolve_target**(*target*)

Given a domain as the hostname, get the ip

Parameters: **target** – target destination of the packets

Returns: ip of the target

my_ping.**send_ping**(*dest_ip*, *count*, *interval*, *size*, *timeout*, *hostname*)

Send ICMP Echo Request packets and display response details.

Parameters:

- **dest_ip** – Destination IP address to send the ping.
- **count** – Number of packets to send (None for unlimited).
- **interval** – Time interval between successive packets in seconds.
- **size** – Size of the ICMP payload in bytes.
- **timeout** – Time in seconds to wait for a response before considering a packet lost.
- **hostname** – Hostname of the target (if resolved from a domain).

Returns: None

my_traceroute module

my_traceroute.**calculate_checksum**(*data*)

Compute the ICMP checksum

Parameters: **data** – data to compute the checksum
Return checksum:

my_traceroute.**create_packet**(*identifier*, *seq*, *size*)

Create ICMP Echo Request packet

Parameters:
- **identifier** – unique id for the packet
- **seq** – sequence number for the packet
- **size** – size of the packet in bytes

Returns: returns the packet

my_traceroute.**main**()

Parse command-line arguments and initiate the traceroute process.

This function handles user input, resolves the target hostname to an IP address, and calls the *traceroute* function to perform the ICMP Echo Request. The user can specify the number of probes per TTL, whether to print hop addresses numerically, and whether to display a summary of unanswered probes.

Command-line arguments:
- -n: Print hop addresses numerically (no hostname resolution).
- -q: Number of probes per TTL (default is 3).
- -S: Print a summary of how many probes were not answered per hop.
- host: Target IP address or hostname to trace the route.

Returns: None

my_traceroute.**resolve_domain**(*ip*)

Given an IP address, gets the host name

Parameters: **ip** – IP address
Returns: hostname/domain of the IP address

my_traceroute.**resolve_target**(*target*)

Given a domain as the hostname, get the ip

Parameters: **target** – target destination of the packets
Returns: ip of the target

my_traceroute.**send_probe**(*dest*, *ttl*, *probe_count*, *print_numerically*, *timeout=4*)

Send ICMP Echo Requests (probes) to a destination with a given TTL

Parameters:
- **dest** – target destination IP
- **ttl** – Time-To-Live value for packets
- **probe_count** – number of probes per TTL
- **print_numerically** – whether to print only numerical addresses
- **timeout** – timeout for each probe response (default: 4s)

Returns: list of probe results (address, TTL, round-trip time) or None on timeout

my_traceroute.**traceroute**(*dest*, *max_hops*, *probe_count*, *print_numerically*, *print_summary*)

Perform a traceroute to a destination

Parameters:

- **dest** – target IP address
- **max_hops** – maximum number of hops to trace
- **probe_count** – number of probes per hop
- **print_numerically** – whether to print only IPs
- **print_summary** – whether to display packet loss per hop