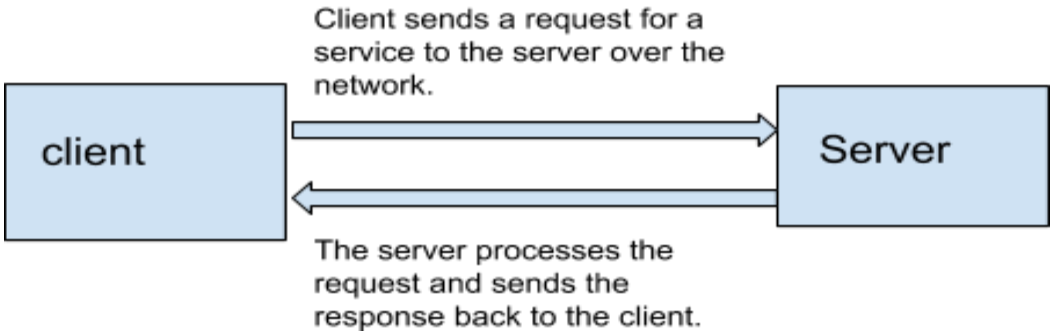
ASSIGNMENT

A **client** is a hardware or software that connects to a remote computer or a server and uses its services.For eg: the computer of every employee in a company is a client which connects to the server and accesses files,internet etc.
Another example is: an antivirus is a client software which performs its tasks when offline but connects to the server for updates.
A **server** is a computer program that provides services or functionalities to the other computers(clients).
Server can refer to both server software and machines designed to run that software. Database servers or application servers are considered to be software.
And any computer can be a server(hardware), if it's running a server software.

Client Server Architecture:



- Client/server architecture is a producer/consumer computing architecture.
- The server acts as the producer.
- The client acts as a consumer.
- The server provides services like file sharing,storage etc to the client when the client requests for it.
- A server computer can manage several clients simultaneously
- One client can be connected to several servers at a time, each providing a different set of services.
- A person accessing Internet is the best example for this architecture.

HTTP is an application layer protocol that web browsers and web servers use to communicate with each other over the Internet.
This protocol defines how messages are formatted and transmitted, and what actions web servers and browsers should take in response to various commands.

HTML is a language that defines how Web pages are formatted and displayed.
HTTPS (**H**yper **T**ext **T**ransfer **P**rotocol **S**ecure) is the secure version of HTTP.
Communications between the browser and website are encrypted by Transport Layer Security (TLS), or Secure Sockets Layer (SSL).

HTTP Request
It is a piece of information sent from client to the server
It consists of a request line and a headers.

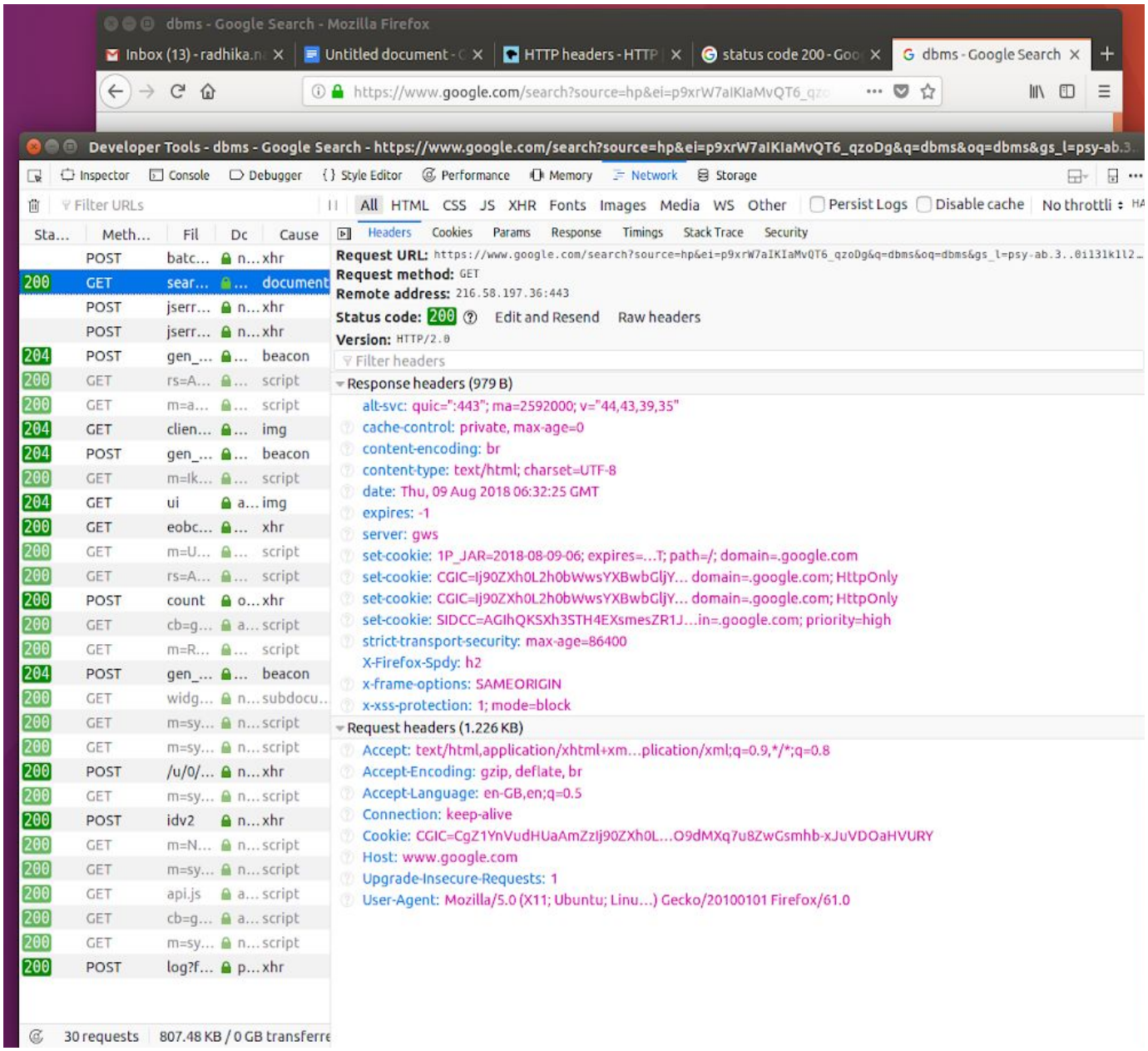
HTTP Response
It is a message sent from the server to the client indicating if the request has been completed successfully.It consists of status line,status code,headers.

HTTP header
Http header is part of a request or response which contains additional information about a request or response.

There are 3 headers:

General headers:These headers have information which is applicable to both request and response.
Request Headers:These headers contain additional information about the data that has been requested for or about the client.
Response Headers:They contain additional information about the response.

In the browser when I type a url,the general,request and response headers can be obtained. Here i searched for dbms in google.When the page appeared,the headers were as follows:



On the extreme left we see the different requests that were sent on loading the page.The headers that is shown above are the headers for only one of the requests.We can see the headers similarly for each one of the requests.

HTTP Methods

DELETE Method
It is used to delete a file at a location specified in the url.

GET Method
This method is used to retrieve data from the server by specifying the parameters in the url itself.
Here the parameters are name and text seprated by &

POST Method
In this method the data or parameters are not sent to the server in the url..

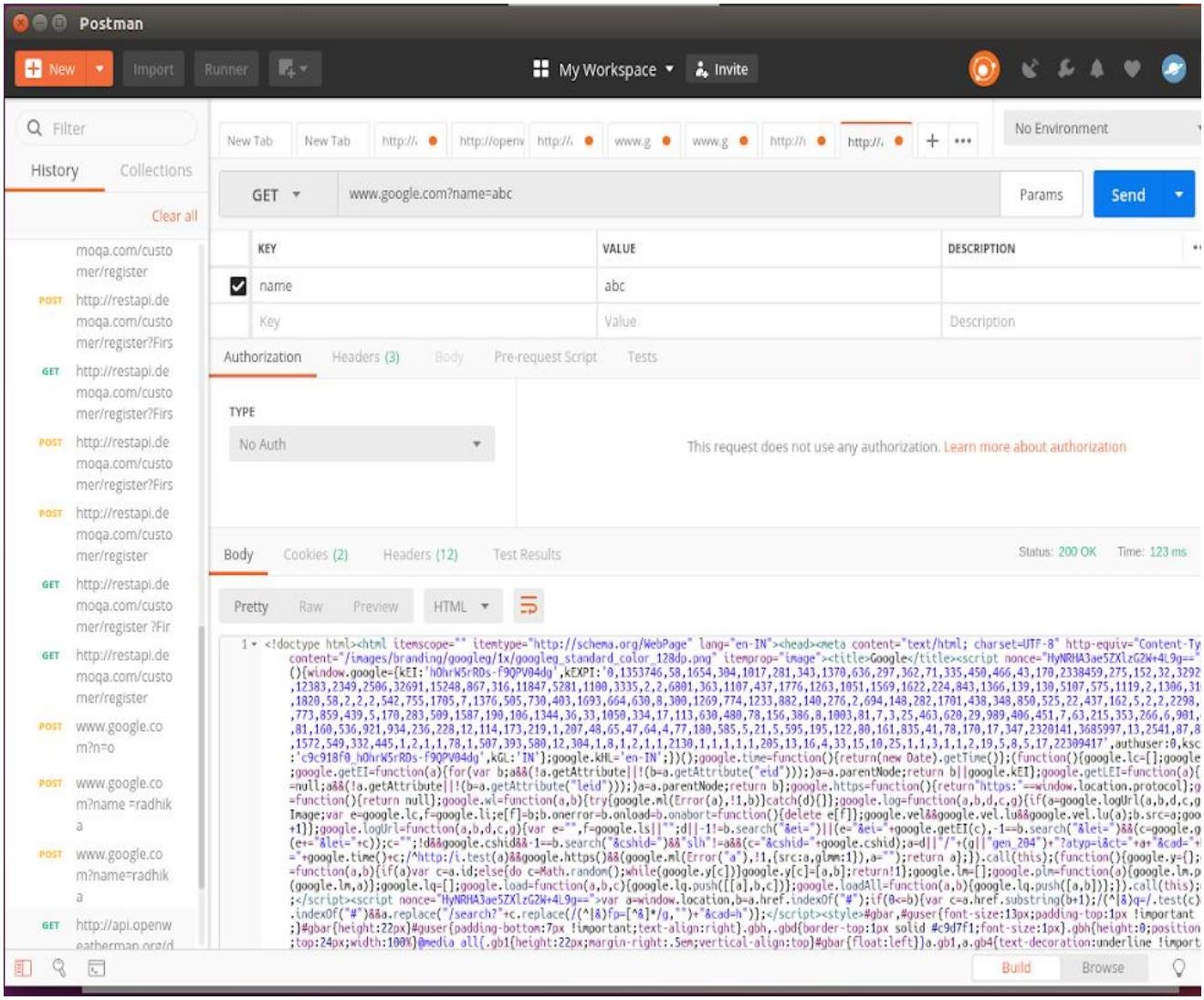
PUT Method
This method is used to send data to a server to create or update a resource.

DELETE Method
This method is used to delete a resource.

GET and POST methods using POSTMAN

Postman is a Google Chrome app for interacting with HTTP APIs. It gives a friendly GUI for constructing requests and reading responses.

Get method:



I typed url as www.google.com in the bar
I then typed the parameters with key as ‘name’ and value as ‘abc’
I get the output with the status code as 200 OK.
I find that the parameters has been passed in the url.

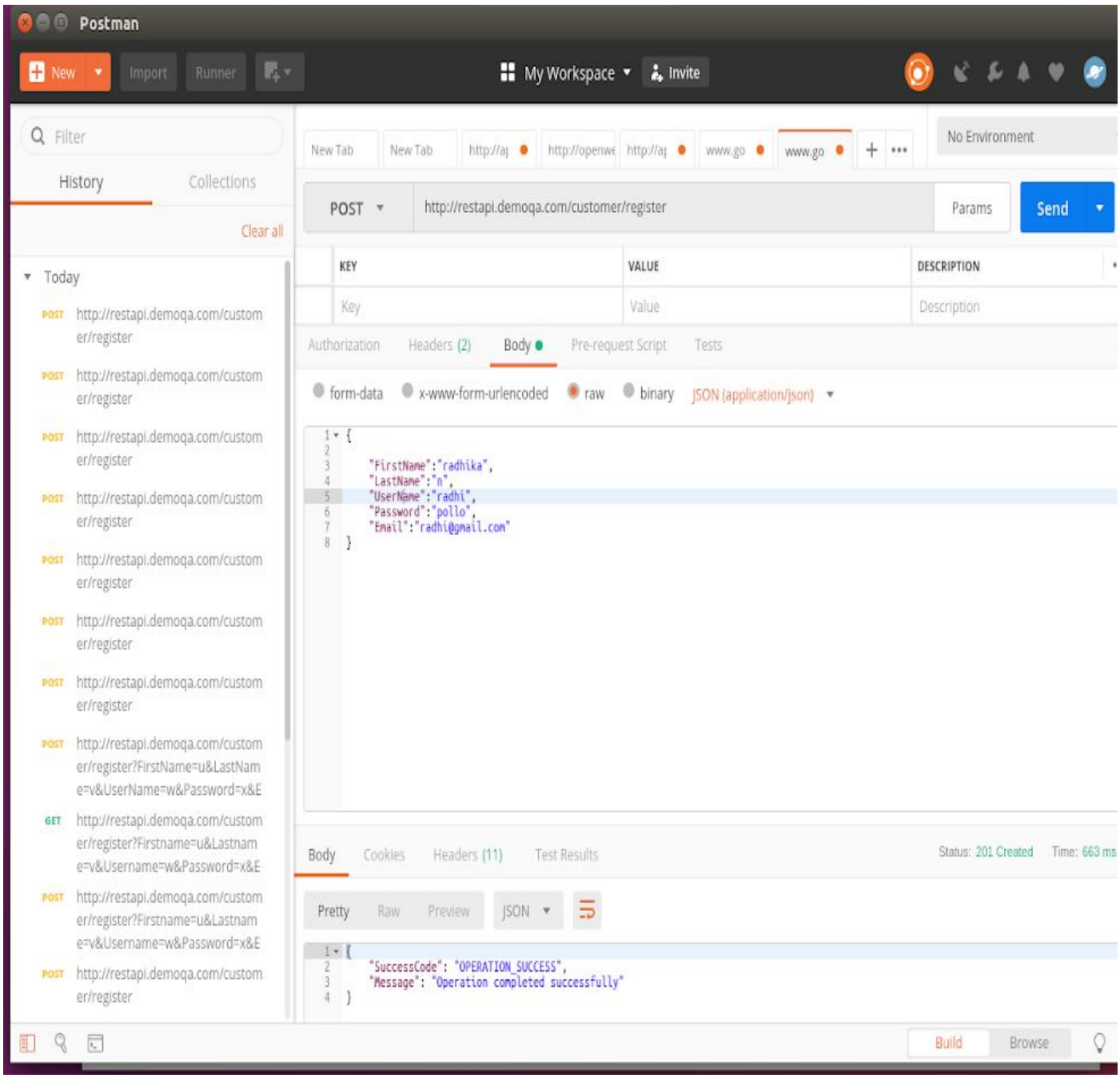
Post method:

I used an api **http://restapi.demoqa.com/customer/register** (This API is used for registering a new customer) and pasted it in the bar next to POST.

I then passed the parameters to insert the details of the customer in json format.

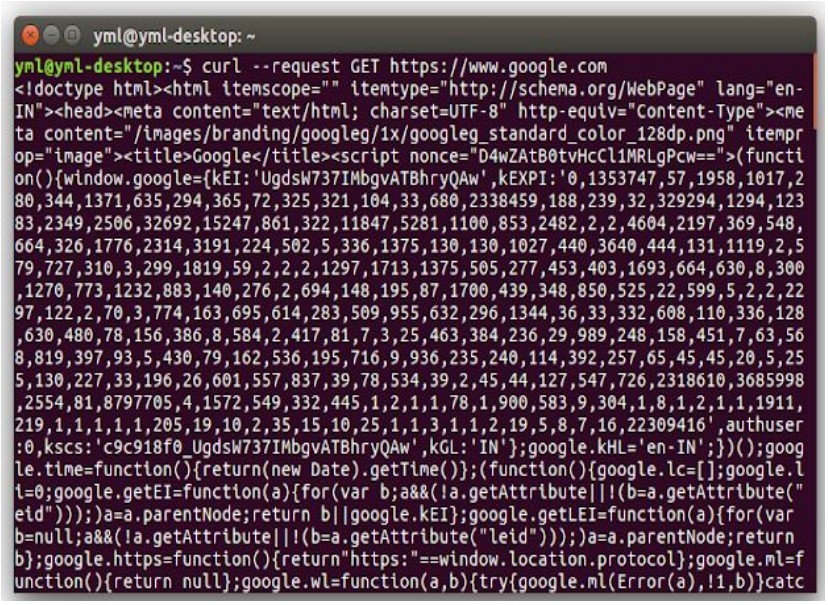
Then when i click send,the output is shown below as 'Operation Completed Successfully'.

When I see the url I can find that the parameters have not been passed through it.



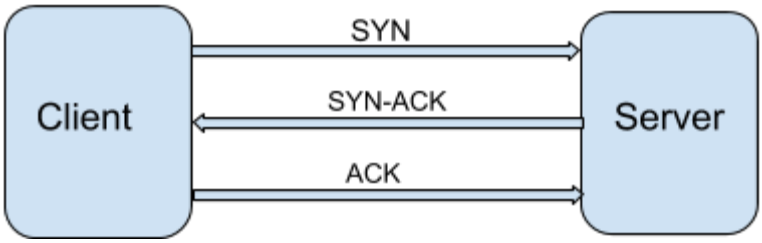
Get Method Using curl:

curl is a tool to transfer data from or to a server, using one of the supported protocols (HTTP, HTTPS, FTP, FTPS, SCP, SFTP, TFTP, DICT, TELNET, LDAP or FILE). The command is designed to work without user interaction.
I typed the command curl --request GET www.google.com in the command line interface.



TCP and UDP:
TCP (Transmission control protocol) is a transport layer protocol.
A connection has to established between the sender and the receiver before sending the data.
The data is divided into segments and then they are transmitted.
Each segment of data has a sequence number.
At the receiver end these segments are arranged to obtain the original datagram.
Tcp detects errors in the message and then perform recovery steps.
Since the data is sent after connection establishment, tcp provides reliable delivery.
An acknowledgement is received after the data reaches the receiver.

3 way handshake for connection establishment



UDP:
UDP (User Datagram protocol) is a transport layer protocol.
A connection is not established between the sender and the receiver unlike tcp.
Udp does not detect errors in the message or perform recovery steps.
Since no connection is established,there is no guarantee that the message will reach the receiver.
No acknowledgement is received after the datagram reaches the receiver.

UDP deliver media data during the shortest time range. UDP, unlike TCP, won't spend extra efforts on fixing errors with delivery, it'll proceed with sustaining uninterrupted flow of information. This feature makes UDP more suitable for live video streaming.

DICTIONARY:

A dictionary can be implemented using a hashtable.There will be a hash function which will compute a value for the dictionary key.Then the value can be stored in the cell of that index. Since in a dictionary there can be only one value for a key ,and a hash function can generate same value for 2 keys,the concept of linear probing can be used,ie,when there is a key with a hash value similar to another key,it can occupy the next free cell.