1. 10 popular commands - daily use

- Pwd : The pwd command stands for "print working directory" and will return your location in the file system. This is useful if you forget where you are.
- Ls : The ls command lists all of the files and directories contained in your current directory.
- Cd : The cd command changes your working directory to a directory you specify.
- Touch : The touch command creates an empty file using the filename you specify.
- Rm : The rm command removes or delete a file.
- Mkdir : The mkdir command creates a directory or a folder.
- Rmdir: The rmdir command removes a directory or folder
- Mv : The mv command moves a file or a directory you specify to the location you specify. It is also used to rename files and directories.
- Cp : The cp command copies a file or directory you specify to the location and new filename you specify.
- Man : The man command displays the manual page for the command you specify.

2. 10 popular network commands

- Ipconfig : ifconfig utility is used to configure network interface parameters. Mostly we use this command to check the IP address assigned to the system.
- Traceroute : traceroute print the route packets take to network host. Destination host or IP is mandatory parameter to use this utility
- dig : dig (Domain Information Groper) is a flexible tool for interrogating DNS name servers.
- It performs DNS lookups and displays the answers that are returned from the name servers.
- Telnet : telnet connect destination host:port via a telnet protocol if connection establishes means connectivity between two hosts is working fine.
- Nslookup : nslookup is a program to query Internet domain name servers.
- Netstate : Netstat command allows you a simple way to review each of your network connections and open sockets.
- Scp : scp allows you to secure copy files to and from another host in the network.
- W : w prints a summary of the current activity on the system, including what each user is doing, and their processes.
- Nmap : nmap is a one of the powerful commands, which checks the opened port on the server.

3. 10 popular Git commands

- Git config : This command sets the author name and email address respectively to be used with your commits.
- Git init : This command is used to start a new repository.
- Git clone : This command is used to obtain a repository from an existing URL.
- Git add : This command adds a file to the staging area.
- Git commit : This command records or snapshots the file permanently in the version history.

- Git diff : This command shows the file differences which are not yet staged.
- Git reset : This command unstages the file, but it preserves the file contents.
- Git status : This command lists all the files that have to be committed.
- Git rm : This command deletes the file from your working directory and stages the deletion.
- Git log : This command is used to list the version history for the current branch.

4. Database
   - Database is a systematic collection of data. Databases support storage and manipulation of data. Databases make data management easy.

5. SQL Database
   - SQL stands for Structured Query language. SQL is the standard language for dealing with Relational Databases. SQL can be used to insert, search, update and delete database records. SQL can do lots of other operations including optimizing and maintenance of databases.

6. NoSQL Database
   - NoSQL is an upcoming category of Database Management Systems. Its main characteristic is its non-adherence to Relational Database Concepts. NOSQL means "Not only SQL".
   - NOSQL database are non-relational databases that scale out better than relational databases and are designed with web applications in mind.
   - They do not use SQL to query the data and do not follow strict schemas like relational models.With NoSQL, ACID (Atomicity, Consistency, Isolation, Durability) features are not guaranteed always.

7. 10 popular databases
   - Oracle : Its really famous among all developers, easy to use, well-written documents, amazing new features like JSON from SQL and so on.
   - MySQL : Enterprises can commence out utilizing the free community server and later upgrade to the commercial version.
   - Microsoft SQL Server : MS SQL Server is a relational database management system built for the basic function of storing retrieving data as required by other applications.
   - PostgreSQL : It is an open source relational database management system developed by a worldwide team of volunteers.
   - MongoDB : MongoDB is a cross-platform, document-oriented database that provides, high performance, high availability, and easy scalability.
   - DB2 : DB2 is a database product from IBM. DB2 is designed to store, analyze and retrieve the data efficiently.
   - Microsoft Access : It is a Database Management System from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools.
   - Cassandra : It is a distributed database from Apache that is highly scalable and designed to manage very large amounts of structured data.

- Redis : It is an open source, advanced key-value store and an apt solution for building high-performance, scalable web applications.
- Elasticsearch : It is a real-time distributed and open source full-text search and analytics engine.

8. ACID

A transaction is a single logical unit of work which accesses and possibly modifies the contents of a database. Transactions access data using read and write operations. In order to maintain consistency in a database, before and after the transaction, certain properties are followed. These are called ACID properties.

- Atomicity : All changes to data are performed as if they are a single operation. That is, all the changes are performed, or none of them are.
- Consistency : Data is in a consistent state when a transaction starts and when it ends.
- Isolation : The intermediate state of a transaction is invisible to other transactions. As a result, transactions that run concurrently appear to be serialized.
- Durability: After a transaction successfully completes, changes to data persist and are not undone, even in the event of a system failure.

9. Aggregations

- In database management an aggregate function is a function where the values of multiple rows are grouped together as input on certain criteria to form a single value of more significant meaning. These are count(), sum(), avg(), min(), max()

10. Joins

- A SQL Join statement is used to combine data or rows from two or more tables based on a common field between them. Different types of Joins are:
    - INNER JOIN
    - LEFT JOIN
    - RIGHT JOIN
    - FULL JOIN

11. CAP Theorem

The CAP theorem implies that in the presence of a network partition, one has to choose between consistency and availability. Note that consistency as defined in the CAP theorem is quite different from the consistency guaranteed in ACID database

- Consistency: Every read receives the most recent write or an error
- Availability: Every request receives a (non-error) response, without the guarantee that it contains the most recent write

- Partition tolerance: The system continues to operate despite an arbitrary number of messages being dropped (or delayed) by the network between nodes

12. Normalization
    - Normalization is the process of organizing the data in the database.
    - Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate the undesirable characteristics like Insertion, Update and Deletion Anomalies.
    - Normalization divides the larger table into the smaller table and links them using relationship.
    - The normal form is used to reduce redundancy from the database table.

13. Database Sharding
    - Database Sharding can be simply defined as a “shared-nothing” partitioning scheme for large databases across a number of servers, enabling new levels of database performance and scalability achievable. If you think of broken glass, you can get the concept of sharding – breaking your database down into smaller chunks called “shards” and spreading those across a number of distributed servers.

14. 7 network layers
    - The network Layer controls the operation of the subnet. The main aim of this layer is to deliver packets from source to destination across multiple links (networks). If two computers (system) are connected on the same link, then there is no need for a network layer. It routes the signal through different channels to the other end and acts as a network controller.
    - It also divides the outgoing messages into packets and to assemble incoming packets into messages for higher levels.
    - In broadcast networks, the routing problem is simple, so the network layer is often thin or even non-existent.

15. Request Response Protocol
    - HTTP is a TCP/IP based communication protocol, that is used to deliver data (HTML files, image files, query results, etc.) on the World Wide Web. The default port is TCP 80, but other ports can be used as well. It provides a standardized way for computers to communicate with each other. HTTP specification specifies how clients' request data will be constructed and sent to the server, and how the servers respond to these requests.

16. Web API
    - A Web API is an application programming interface for either a web server or a web browser. It is a web development concept, usually limited to a web application's client-side (including any web frameworks being used), and thus usually does not include web server or browser implementation details such as SAPIs or APIs unless publicly accessible by a remote web application.

17. REST

- REST, or REpresentational State Transfer, is an architectural style for providing standards between computer systems on the web, making it easier for systems to communicate with each other. REST-compliant systems, often called RESTful systems, are characterized by how they are stateless and separate the concerns of client and server. We will go into what these terms mean and why they are beneficial characteristics for services on the Web.

18. HTTP Status Codes to Handle

HTTP response status codes indicate whether a specific HTTP request has been successfully completed. Responses are grouped in five classes:

- Informational responses (100–199),
- Successful responses (200–299),
- Redirects (300–399),
- Client errors (400–499),
- and Server errors (500–599).

19. HTML

- Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.
- Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

20. Box Model

- The CSS box model is essentially a box that wraps around every HTML element. It consists of: margins, borders, padding, and the actual content.
- Content - The content of the box, where text and images appear
- Padding - Clears an area around the content. The padding is transparent
- Border - A border that goes around the padding and content
- Margin - Clears an area outside the border. The margin is transparent

21. Margin

- The CSS margin properties are used to create space around elements, outside of any defined borders.

22. Padding

- The CSS padding properties are used to generate space around an element's content, inside of any defined borders.

23. CSS Selectors
    - CSS selectors are used to select the content you want to style. Selectors are the part of CSS rule set. CSS selectors select HTML elements according to its id, class, type, attribute etc.

24. CSS Specificity
    - CSS Specificity is the set of the rules applied to CSS selectors in order to determine which style is applied to an element. The more specific a CSS style is, the higher point value it accrues, and the likelier it is to be present on the element's style.

25. Flexbox
    - The Flexbox Layout officially called CSS Flexible Box Layout Module is new layout module in CSS3 made to improve the items align, directions and order in the container even when they are with dynamic or even unknown size. The prime characteristic of the flex container is the ability to modify the width or height of its children to fill the available space in the best possible way on different screen sizes.

26. Grid
    - A grid is an intersecting set of horizontal and vertical lines – one set defining columns, and the other, rows. Elements can be placed onto the grid, within these column and row lines.
    - CSS Grid Layout excels at dividing a page into major regions or defining the relationship in terms of size, position, and layer, between parts of a control built from HTML primitives.

27. Git
    - Git is a distributed version-control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files. Its goals include speed, data integrity, and support for distributed, non-linear workflows.

28. HTTP
    - HTTP means HyperText Transfer Protocol. HTTP is the underlying protocol used by the World Wide Web and this protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.

29. TCP
    - TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation through which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other. Together, TCP and IP are the basic rules defining the Internet.

30. UDP
    - UDP (User Datagram Protocol) is an alternative communications protocol to Transmission Control Protocol (TCP) used primarily for establishing low-latency and loss-tolerating connections between applications on the internet.

31. Web server
    - On the hardware side, a web server is a computer that stores web server software and a website's component files (e.g. HTML documents, images, CSS stylesheets, and JavaScript files). It is connected to the Internet and supports physical data interchange with other devices connected to the web.

32. Static server
    - A static web server, or stack, consists of a computer (hardware) with an HTTP server (software). We call it "static" because the server sends its hosted files "as-is" to your browser. A dynamic web server consists of a static web server plus extra software, most commonly an application server and a database.

33. Application server
    - An application server is a software framework that provides both facilities to create web applications and a server environment to run them. Application Server Frameworks contain a comprehensive service layer model.

34. DNS server
    - A DNS server is a computer server that contains a database of public IP addresses and their associated hostnames, and in most cases serves to resolve, or translate, those names to IP addresses as requested. DNS servers run special software and communicate with each other using special protocols.

35. Database Server
    - A database server is a server which uses a database application that provides database services to other computer programs or to computers, as defined by the client–server model.

36. Standalone Application
    - Standalone applications are traditional software that are installed on each client system. Essence Computing only develops platform-independent applications, so that the user can use any Operating System of their choice on the system.

37. MVC
    - The Model-View-Controller (MVC) is an architectural pattern that separates an application into three main logical components: the model, the view, and the controller. Each of these components are built to handle specific development aspects of an application.

38. Operating System

- An Operating System (OS) is an interface between a computer user and computer hardware. An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

39. Kernel
    - A Kernel is the central part of an operating system. It manages the operations of the computer and the hardware, most notably memory and CPU time. There are five types of kernels: A micro kernel, which only contains basic functionality; A monolithic kernel, which contains many device drivers.

40. Process
    - In computing, a process is the instance of a computer program that is being executed by one or many threads. ... Depending on the operating system (OS), a process may be made up of multiple threads of execution that execute instructions concurrently.

41. Thread
    - A thread is a flow of execution through the process code, with its own program counter that keeps track of which instruction to execute next, system registers which hold its current working variables, and a stack which contains the execution history. A thread is also called a lightweight process. Threads provide a way to improve application performance through parallelism.

42. SOLID
    - SOLID Principles is a coding standard that all developers should have a clear concept for developing software in a proper way to avoid a bad design.

43. Apache Web Server
    - The Apache HTTP Server, colloquially called Apache, is free and open-source cross-platform web server software, released under the terms of Apache License 2.0. The Apache web server has modules which add more functions to its software, such as MPM (for handling multi-processing modes) or mod_ssl for enabling SSL v3 and TLS support (suggested reading: TLS vs SSL).

44. Nginx Web Server
    - Nginx is a web server which can also be used as a reverse proxy, load balancer, mail proxy and HTTP cache. The software was created by Igor Sysoev and first publicly released in 2004. A company of the same name was founded in 2011 to provide support and Nginx plus paid software.

45. Messaging Queue
    - In computer science, message queues and mailboxes are software-engineering components used for inter-process communication, or for inter-thread communication within the same process. They use a queue for messaging – the passing of control or of content.

46. Enterprise Message Bus
    - An enterprise service bus implements a communication system between mutually interacting software applications in a service-oriented architecture.

47. RabbitMQ
    - RabbitMQ is an open-source message-broker software that originally implemented the Advanced Message Queuing Protocol and has since been extended with a plug-in architecture to support Streaming Text Oriented Messaging Protocol, Message Queuing Telemetry Transport, and other protocols.

48. Kafka
    - Apache Kafka is an open-source stream-processing software platform developed by LinkedIn and donated to the Apache Software Foundation, written in Scala and Java. The project aims to provide a unified, high-throughput, low-latency platform for handling real-time data feeds.

49. Zookeeper
    - Apache ZooKeeper is a software project of the Apache Software Foundation. It is essentially a service for distributed systems offering a hierarchical key-value store, which is used to provide a distributed configuration service, synchronization service, and naming registry for large distributed systems.

50. Service Oriented Architecture
    - Service-oriented architecture (SOA) is a style of software design where services are provided to the other components by application components, through a communication protocol over a network. The basic principles of service-oriented architecture are independent of vendors, products and technologies.

51. Microservices Architecture
    - Microservices are a software development technique —a variant of the service-oriented architecture structural style— that arranges an application as a collection of loosely coupled services. In a microservices architecture, services are fine-grained and the protocols are lightweight.

52. Redis? Why?
    - Redis is an open source, in-memory Data Structure Store, used as a database, a caching layer or a message broker. Sometimes referred to as the “Leatherman of Databases”, it’s simple yet flexible design philosophy makes it an effective choice for solving a multitude of demanding data processing tasks. Redis data structures resolve very complex programming problems with simple commands executed within the data store, reducing coding effort, increasing throughput, and

reducing latency. Caching is one of Redis' most popular use cases as Redis perfectly meets the requirements of an application's distributed caching layer.

53. Solr? Why?
    - Solr is an open-source enterprise-search platform, written in Java, from the Apache Lucene project. Its major features include full-text search, hit highlighting, faceted search, real-time indexing, dynamic clustering, database integration, NoSQL features and rich document handling.

54. ElasticSearch? Why?
    - Elasticsearch is a highly scalable open-source full-text search and analytics engine. It allows you to store, search, and analyze big volumes of data quickly and in near real time. It is generally used as the underlying engine/technology that powers applications that have complex search features and requirements.

55. Celery? Why?
    - Celery is an open source asynchronous task queue or job queue which is based on distributed message passing. While it supports scheduling, its focus is on operations in real time. Celery is a task queue implementation for Python web applications used to asynchronously execute work outside the HTTP request-response cycle.

56. Node JS
    - Node.js is an open-source, cross-platform, JavaScript runtime environment that executes JavaScript code outside of a browser.

57. MongoDB? Why?
    - MongoDB is a cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schema. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License. MongoDB is great for transactional stores where performance is a concern. Its also great when the data structure is going to evolve over time, as its schema-less operations allow you to update the data on the fly.

58. Progressive Web Apps (PWA)
    - A Progressive Web App (PWA) is a web app that uses modern web capabilities to deliver an app-like experience to users. These apps meet certain requirements (see below), are deployed to servers, accessible through URLs, and indexed by search engines.

59. Session Based Authentication
    - Session based authentication is one in which the user state is stored on the server's memory. When using a session based auth system, the server creates and stores the session data in the server memory when the user logs in and then stores the session Id in a cookie on the user browser.

- The session Id is then sent on subsequent requests to the server and the server compares it with the stored session data and proceeds to process the requested action.

60. Token Based Authentication
    - Token based authentication is one in which the user state is stored on the client. This has grown to be the preferred mode of authentication for RESTful APIs. In the token based authentication, the user data is encrypted into a JWT (JSON Web Token) with a secret and then sent back to the client.
    - The JWT is then stored on the client side mostly localStorage and sent as a header for every subsequent request. The server receives and validates the JWT before proceeding to send a response to the client.

61. Authorization
    - Authorization is a security mechanism used to determine user/client privileges or access levels related to system resources, including computer programs, files, services, data and application features. Authorization is normally preceded by authentication for user identity verification.

62. Docker
    - Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. Containers are isolated from one another and bundle their own software, libraries and configuration files; they can communicate with each other through well-defined channels.

63. IaaS
    - Infrastructure as a service are online services that provide high-level APIs used to dereference various low-level details of underlying network infrastructure like physical computing resources, location, data partitioning, scaling, security, backup etc.

64. AWS
    - Amazon Web Services is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis.

65. PaaS
    - Platform as a Service or Application Platform as a Service or platform-based service is a category of cloud computing services that provides a platform allowing customers to develop, run, and manage applications without the complexity of building and maintaining the infrastructure typically associated with developing and launching an app.

66. Heroku
    - Heroku is a cloud platform as a service supporting several programming languages. One of the first cloud platforms, Heroku has been in development since June 2007, when it supported only

the Ruby programming language, but now supports Java, Node.js, Scala, Clojure, Python, PHP, and Go.

67. Hoisting
    - Hoisting is a JavaScript mechanism where variables and function declarations are moved to the top of their scope before code execution. Inevitably, this means that no matter where functions and variables are declared, they are moved to the top of their scope regardless of whether their scope is global or local.

68. Pass by Reference/Pass By Value
    - Pass by value: In this approach we pass copy of actual variables in function as a parameter. Hence any modification on parameters inside the function will not reflect in the actual variable.
    - Pass by reference: In this approach we pass memory address actual variables in function as a parameter. Hence any modification on parameters inside the function will reflect in the actual variable.

69. Closures
    - A closure is the combination of a function bundled together (enclosed) with references to its surrounding state (the lexical environment). In other words, a closure gives you access to an outer function's scope from an inner function.

70. Prototypal Inheritance
    - Inheritance refers to an object's ability to access methods and other properties from another object. Objects can inherit things from other objects. Inheritance in JavaScript works through something called prototypes and this form of inheritance is often called prototypal inheritance.

71. Mutable Methods in JS
    - The methods that can get changed after we have defined them earlier are called mutable.

72. Immutable Methods in JS
    - The methods that can not get changed after we have defined them earlier are called mutable.

73. React
    - If you are using pure Javascript, your DOM object will re-render every time any change will be done in HTML elements. It’s fine if you have a static website where not too much happens; the performance is safe. But in the case of dynamic web apps that have lots of user interaction elements, it doesn’t work so good. The performance of the application goes down significantly.
    - Creators of ReactJS decided to handle this issue, and they created a Virtual DOM. When changes are made in the DOM, ReactJS creates a copy, called Virtual DOM. This copy is compared with

the normal DOM, and only the element which is different is re-rendered. It takes less computing power, and loading time, that's why it's a good improvement.

74. Why React?
    - React is a framework with a low entry threshold, and its learning curve is quite low, which makes it friendly for beginners. Also, the huge community and a lot of resources to learn makes ReactJS very competitive at the start point. Having the knowledge of HTML, CSS, and Javascript can help to learn React and create an amazing Single Page Applications very quickly.

75. Redux
    - Redux is a predictable state container for JavaScript apps.
    - Redux makes it easy to manage the state of your application. It helps you manage the data you display and how you respond to user actions.

76. Why Redux?
    - With Redux, you've got a store where you can keep all your application state. If a state change occurs in Component A, it is then relayed to the store and other components B and C that need to be aware of this change of state in Component A can subscribe to the store. Component A sends its state changes to the store, if Component B and C need this state change, they can get it from the store. Thus, our data flow logic is seamless.

77. State
    - State is the place where the data comes from. We should always try to make our state as simple as possible and minimize the number of stateful components. If we have, for example, ten components that need data from the state, we should create one container component that will keep the state for all of them.

78. Props
    - Props are arguments passed into React components.
    - The main difference between state and props is that props are immutable. This is why the container component should define the state that can be updated and changed, while the child components should only pass data from the state using props.
    - When we need immutable data in our component, we can just add props to reactDOM.render() function in main.js and use it inside our component.