C LANGUAGE

1. Basic C

- what is programming ? Why we need to learn programming ?
- History of C language
- Flowchart and Algorithm, Pseudo code.
- Compiler and Text Editor
- Installing IDE TURBO or other IDEs.
- Features and Application of C language
- Compilation and Execution of C program
- Structure of C program.
- Create First C program(HELLO WORLD)

2. Data Types & I/O functions

- C character set
- Tokens , Identifiers , Keywords , Comments
- Data Types
  - Primary data type
  - derived data type
  - user defined data type
- Format specifiers
- Variables & constants
- Enumerated Data type
- Storage classes
- Header files & user defined header file
- Introduction to I/O Functions
  - Formatted I/O functions
  - Un-formatted I/O functions

3. Operands & operators

- Operands & operators
- Binary Operators
  - Arithmetic Operators
  - Relational Operators
  - Logical Operators
  - Bitwise Operators
  - Assignment Operators
  - Other operators

- Unary operators
  - pluse(+)
  - minus(-)

- increment(++) operator
- decrement(--) operator
- Ternary operator
  - ()?: operator
- Operator Precedence and Associativity
- Evaluation of Expression

4.   Control Statements

- Decision making statement
  - If
  - else If ladder
  - if … else
  - Nested if else
- Iteration control statement
  - while loop
  - for loop
  - do … while loop
  - nested loop
- Selection control statement
  - switch
  - nested switch
  - ()?: operator
- Flow control statement
  - break
  - goto
  - return
  - continue
  - exit

5.   Array

- Understanding array
- array declaration, initialization, accessing elements
- Application of array.
  - Sorting array
  - search in array
  - min,max,sum as well as other logical operation on array
- 2nd-dimension , 3rd-dimension & N^{th} Dimension

6.   String : array of character

- Understanding string & declaration & Initialization
- operations on string
  - strlen()
  - strcmp()
  - strlwr()
  - strchr()
  - strupr()
  - strstr()
  - strcat()
  - strrev()
  - strcpy()
  - strset()

➢ Array of string

7. Function : the group of statement

➢ Understanding function
➢ function prototype & definition
➢ Types of function prototype
  • without argument and without return value
  • with argument and without return value
  • without argument and with return value
  • with argument and with return value
➢ function calls
  • call by value   • call by pointer
➢ Recursion
➢ passing array & string to function

8. Pointers

➢ Introduction to Pointers
➢ Pointer Declaration & initialization
➢ Pointers arithmetic
➢ pointers & array
➢ Array of pointers
➢ pointers & function

9. Structure & union

➢ Structure
  • introduction of structure
  • declaration , initialization of structure
  • accessing members of structure
  • Application of structure
    1. structure & function
    2. structure & array
    3. structure & pointers
➢ Union
  • introduction of union
  • declaration , initialization of Union
  • accessing members of union
➢ Structure vs Union

10. FILE Handling

➢ Understanding File handling
➢ File Modes
- r
- w
- a
- r+
- w+
- a+
➢ File handling functions
- fopen()
- fclose()
- fprintf()
- fscanf()
- fputc()
- fgetc()
- fputw()
- fgetw()
- fseek()
- ftell()
- rewind()

11. DMA & linked list

➢ Dynamic memory allocation
- Understanding Dynamic Memory Allocation
- DMA functions
  1. malloc()
  2. calloc()
  3. realloc()
  4. free()
➢ linked list
- Understanding linked list
- Operations on linked list
  1. insertion
  2. deletion
  3. searching
  4. display
➢ Types of linked list
- single linked list
- circular linked
- Double linked list

12. Pre-processor

➢ User-defined header file
➢ #define, #undef
➢ #define as macro
➢ conditional :{#if, #else, #elif, #endif, #ifdef, #ifndef}
➢ #errors

1. Programming

- ➢ What is programming?
- ➢ POP vs OOP programming.
- ➢ OOP's Concepts.
  - Class & objects.
  - Abstraction.
  - Encapsulation
  - Inheritance.
  - Polymorphism.
- ➢ C++ programming and it's Features

2. Basics of C++

- ➢ Basic structure of C++ programming
- ➢ Tokens in programming language.
- ➢ Types of Token:
  - Keywords
    - ▪ What is keywords and list of keywords in c++
  - Identifiers
    - ▪ what is identifier
    - ▪ rules to define identifiers.
    - ▪ Variables.
  - Constants
    - ▪ Define constants in C++
    - ▪ constant vs Variable.
  - Strings
    - ▪ char [] vs string class
  - special symbols
    - ▪ All printable characters and symbols
  - Operators
    - ▪ Expression with Operator and its Types.
- ➢ Data Types
  - Build-in Data Type
  - User defined Data Type
  - derived data type

3. Input/output in C++

- ➤ Header files
- ➤ input/output objects
  - [cout,cin]
- ➤ error msg
  - [cerr and clog]
- ➤ Type casting
  - Implicit type casting
  - explicit type casting

4. Operators and control statements

- ➤ Operators and operands
  - Types of operators
    - · Arithmetic operators
    - · Relational operators
    - · Logical operators
    - · Bitwise operators
    - · Assignment Operators
  - precedence and associativity
- ➤ Conditional statements
  - if statement
  - if-else statement
  - else if ladder statement
  - nested if statement
  - ➤ switch statement
  - ➤ range switch
  - ➤ nested switch statement
  - ➤ Turnary Operator(?:)
- ➤ Iteration Statements
  - for loop
  - while loop
  - do while
  - nested loops
- ➤ Flow control statement
  - Break
  - continue
  - return
  - exit
  - goto

5. Array : the collection of data

- ➤ What is array
- ➤ Types of Array

- One dimension array
- multi-dimension array
- character array
➢ Sorting and searching elements

6. OOP's Concepts

➢ Class and Object
➢ Constructor
- default constructor
- parameterized constructor
- copy constructor
➢ destructor
➢ Abstraction
➢ Encapsulation
➢ Inheritance
- Single inheritance
- multilevel inheritance
- multiple inheritance
- hierarchical inheritance
- hybrid inheritance
- diamond problem
➢ Polymorphism
- compile time
- run time

7. Functions The group of statements

➢ Function prototype
➢ Type of functions
- Without return value, without arguments
- Without return value, with arguments
- With return value, without arguments
- With return value, with arguments
➢ Function calls
- call by value
- call by reference

- call by Pointer
➢ recursion

8. Structure & Unions

➢ Structure
- structure variable [object of structure]
- nested structure
- structure array
- function with structure
➢ Union
➢ structure vs Union

9. Pointers

➢ Pointers
➢ pointer arithmetic
➢ pointer with array
➢ array of pointer
➢ pointer to pointer

10. File management

➢ File classes
➢ File Modes
➢ File operation
- file open/close
- write/read file
- appending content in file
➢ file flags

11. String the class

➢ String
➢ Char array as string [null terminated string]
➢ NULL terminated string functions
- strlen()   • strcpy()

- strlwr()
- strupr()
- strcmp()
- strchr()

➢ String class
➢ String class method

- append()
- assign()
- at()
- begin()
- capacity()
- compare()

➢ String operations

- strstr()
- strrev()
- strset()

- empty()
- end()
- erase()
- find()
- length()
- swap()

12. Templates

➢ Template
- template with functions
- template with class

➢ Types of Template
- Type template
- Non-type template
- Template Template

➢ Template specialization

13. Exception Handling

➢ Types of error
- Compile time Error
- Run time Error

➢ Exceptions
- try-catch block
- multi-catch block
- nested try catch block

14. Pre-processor directives

➢ Pre processor directives

- ➢ `#include`
- ➢ `#define & #undef`
- ➢ `#ifdef & #ifndef`
- ➢ `#if, #else, #elseif, #endif`

HTML

1. Web concepts

➢ Web
➢ Dawn of web
➢ Architecture of the web
➢ basic concepts
  - Internet
  - ISP
  - HTTP/HTTPS
  - DNS
  - SMTP
  - W3C
  - URL
  - Hyperlink
  - website
  - webapplicatio n
  - Web-browser
➢ Front-end vs back-end
➢ Introduction to markup languages
  - HTML
  - XML
  - MD
➢ Introduction to scripting languages
  - php
  - javascript

2. Starting with HTML5

➢ History & HTML5
➢ path for designing web page
➢ media
  - text
  - graphics
  - audio
  - video
➢ HTML with IDE concepts
➢ structure of HTML
➢ tag syntax
➢ basic tags
➢ tags with basic css
➢ comments
➢ lists
  - order list
  - unordered list
  - description list

➢ Anchor tag
➢ Table tag
- attributes
- caption
- nested table

3. Form Tag

➢ Form
➢ form attributes
➢ form methods
➢ form controls
- input tag
- button
- checkbox
- radio button
- select
- text-area
- label
- input tag with HTML5
- datalist
- keygen
- output

4. Media in web page

➢ About media
➢ Images in Web-pages
- <img> tag
- <picture> tag
- <a> with Image
- image map
➢ Audio in HTML
- audio attributes
➢ Video in HTML
- video attributes
➢ Objects in HTML
➢ Graphics in HTML
- canvas
- svg
- canvas vs svg

CSS

5.   Role of CSS in web-page

- ➤ CSS & CSS3
- ➤ selectors in CSS
- ➤ Comments
- ➤ types of CSS
  - External
  - Internal
  - Inline
- ➤ css properties
- ➤ css variables

6.   Animation with CSS

- ➤ Animation
- ➤ advantage of css animation
- ➤ keyframes
- ➤ animation
- ➤ vendors of web browser
- ➤ browser support

JavaScript

7.   Web-scripting

- ➤ Java script(JS)
- ➤ IDEs for JS
- ➤ Features of JS
- ➤ Adding JS in HTML
  - internal
  - external
- ➤ comments & no-script tag
- ➤ variable
- ➤ functions
- ➤ events
- ➤ validation form With JS

8. jQuery

- ➢ jQuery
- ➢ Syntax of jQuery
- ➢ jQuery with Css selector
- ➢ methods in jQuery
- ➢ jQuery with HTML Elements
- ➢ Effects with JQuery

R   W   D

9. RWD

- ➢ RWD
- ➢ veiwport
- ➢ grid in css
- ➢ media queries
- ➢ Images
- ➢ video
- ➢ frameworks
- ➢ Templates

10. deployment

- ➢ Deployment
- ➢ need of deployment
- ➢ DNS
- ➢ Testing

1. Web Application development With PHP

- ➢ Side of web development
  - server side
  - client side
- ➢ history of PHP
- ➢ advantages of PHP
- ➢ features of PHP 7
- ➢ installing XAMPP server for PHP
- ➢ localhost & server
- ➢ Syntax of PHP
- ➢ "Hello World" in PHP

2. Dawn of Code with PHP

- ➢ comments
- ➢ Tokens & blocks
- ➢ variables
- ➢ Php with HTML & CSS
- ➢ echo vs print
- ➢ data Type
  - Integers
  - Boolean
  - double
  - String
  - Array
  - Objects
  - Callable
  - Iterable
  - NULL
  - Resources
- ➢ Escape Sequences
- ➢ normal function
- ➢ scope of variable
  - local
  - global
  - function parameter
  - static variable
- ➢ Constants
- ➢ Variable vs Constant

3. Statements

- ➢ Operators
  - Arithmetic
  - bitwise
  - array
  - Relational
  - assignment
  - Logical
  - conditional
- ➢ Conditional control statements
  - if statements
  - if else ladder
  - if else
  - swicth
- ➢ Iteration control statements
  - while loop
  - for loop
  - do while loop
  - for-each loop
- ➢ Jump statements
  - break
  - return
  - goto
  - continue
  - exit

4. Array & functions

- ➢ Array
  - numeric array
  - Associative array
  - Multi-dimension
- ➢ functions
  - build-in function
  - user-defined function
- ➢ function header & body
- ➢ HTML form tag
  - get method
  - post method
  - request
- ➢ Form validation with PHP

5. OOP's Concept with PHP

- ➢ Basic concept
  - class & Object
  - member variable
  - member function
  - visibility of data member & member function
- ➢ Constructor
- ➢ Destructor
- ➢ Inheritance

- single inheritance
- multi-level inheritance
- Hierarchical Inheritance
➢ Interface & Abstract
➢ constants in class
➢ keyword with class
  - this
  - static
  - final
➢ Anonymous class
➢ Polymorphism
  - static polymorphism
  - Dynamic Polymorphism
➢ Magic methods

6. Database connection

➢ MySQL
➢ Database handling with GUI in phpmyadmin
  - create user
  - create database
  - create table
  - perform various queries on table
➢ Database Handling with PHP scripts
  - DDL queries
  - DML queries
  - DQL queries
  - DCL queris
➢ fetching values from database
  - mysqli_fetch_array
  - mysqli_fetch_assoc
  - MYSQLI_NUM
➢ Managing pages with PHP
➢ create log-in system with php

7. Handling Errors

➢ Errors
➢ die / exit function
➢ create custom error message
➢ Level of errors
➢ Handling Exception witn try-catch block
➢ errors & logs
➢ debugging

8. Dates & Time

➤ Time()
➤ getdate()

➤ date()
➤ date & time parameters

9. MVC

➤ Understanding MVC
➤ Creating Controller
➤ Creating Model
➤ Creating View
➤ Combining MVC

10. Testing web applications

➤ Testing
➤ need of Testing
➤ checklist(manually Testing)
- functionality Testing
- Usability Testing
- compatibility Testing
- Database Testing
- Crowd Testing
- Interface Testing
- Performance Testing
- Security Testing
➤ Automatic Testing
- TDD
- BDD
➤ Frameworks
- PHPunit
- Codeception
- PHPSpec
- SimpleTest
- BeHat
- storyplayer
➤ Testing web applications with
- PHPUnit
- Codeception

11. Security In Web applications

➤ Security
➤ special characters
➤ Authentication
➤ Encryption
➤ Securing web application

1. Introduction to Java Programming

- ➢ What is java
- ➢ History of java
- ➢ Difference between c++ & Java
- ➢ Features of Java
- ➢ Java Virtual machine (**JVM**)
- ➢ Java Devlopment Kit (**JDK**)
- ➢ Java Run-time Environment (**JRE**)
- ➢ parts of JAVA Edition SE, EE, ME
- ➢ JDK installation & environment variable's path setting
- ➢ "Hello world" first program in java
  - • compile & run the program
  - • .class file
  - • java ᵥₛ javac cmds
  - • run program without class file
- ➢ Tokens in java
  - • variable
  - • keywords
  - • literals
  - • special symbols
  - • strings
  - • operator
- ➢ About main method
- ➢ display statements
  - • System.out.println()
  - • System.out.print()
  - • System.out.printf()

2. Dawn of core programming

- ➢ Comments in programming
  - • single line
  - • multi-line
  - • document
- ➢ naming conventions
- ➢ data types
  - • Integer
  - • float
  - • double
  - • character
  - • string
  - • boolean
- ➢ Literals
  - • Integer
  - • float
  - • double
  - • character
  - • string
  - • boolean

- ➢ Importing classes & packages
  - • Scanner class
  - • BufferedReader
- ➢ Operators
  - • Binary Operators
    - ▪ Arithmetic
    - ▪ relational
    - ▪ logical
    - ▪ bitwise
    - ▪ assignment
  - • Unary operator
    - ▪ minus
    - ▪ plus
    - ▪ increment
    - ▪ decrement
  - • Ternary operator
    - ▪ ()?: operator
  - • Other operator
    - ▪ boolean
    - ▪ instanceOf
    - ▪ new
    - ▪ cast
- ➢ Priority of Operator

3. Control statements

- ➢ Conditional statement
  - • if statement
  - • if .. else statement
  - • else if ladder
  - • nested if else
  - • switch statement
- ➢ Iteration control statement
  - • while loop
  - • do .. while loop
  - • for loop
  - • for-each loop
  - • nested loop
- ➢ Flow control statement
  - • break
  - • continue
  - • return
  - • System.exit(0)

4. Array : collection of elements

- ➢ Understanding array
- ➢ types of array
  - • 1 dimension array
  - • 2 dimension array
  - • n^{th} dimension array
- ➢ Array.length & string.length()

➢ command line arguments

5. String

➢ String class
- String Constructors
- string class methods
- String comparing
- Immutability of Strings
➢ StringBuffer class
- StringBuffer constructors
- StringBuffer methods
➢ String Tokenizer

6. OOP's Concepts with JAVA

➢ POP vs OOP
➢ java as Pure OOP
➢ class & objects
- data members & methods
➢ constructors
- Default constructor
- parameterized constructor
➢ Encapsulation
➢ abstraction
➢ access specifiers
- public
- private
- protected
- default
➢ inheritance
➢ polymorphism

7. Methods

➢ Understanding methods
➢ Method prototype & method Body
➢ function vs method
➢ instance of method
➢ passing to method
- passing value
- passing object
- passing array
➢ recursion

- ➢ factory method
- ➢ static keyword
  - static method
  - static data member
  - static block
- ➢ Anonymous inner class

8. Inheritance

- ➢ Understanding Inheritance
- ➢ Types of Inheritance
  - single
  - multi-level
  - hierarchical
- ➢ Why java doesn't support Multiple inheritance
- ➢ this keyword
- ➢ super keyword
- ➢ protected keyword
- ➢ final keyword
  - final data member
  - final method
  - final class

9. Polymorphism

- ➢ Understanding Polymorphism
- ➢ Types of polymorphism
  - Compile time polymorphism
  - Run-time Polymorphism
- ➢ Method overloading vs method overriding
- ➢ Polymorphism with methods
  - static
  - private
  - final

10. Type casting

- ➢ Types of type casting
  - widening
  - narrowing
- ➢ Generalization & Specialization
- ➢ Object class
- ➢ cloning the object

11. Abstract & Interface

➢ Abstract
  • Abstract method & abstract class
➢ Interface
➢ multiple inheritance using interface
➢ Abstract class vs Interface

12. Packages

➢ Understanding packages
➢ packages
  • Build-in packages
  • User-Defined packages
➢ jar file
➢ interface with package
➢ nested package

13. Exception Handling

➢ Errors in Java
➢ Exceptions
➢ throws clause & throw clause
➢ Types of Exception
  • Build-in in exception
  • User-Defined exception
➢ re-throwing an exception

14. Wrapper classes

➢ Understanding wrapper class
➢ Number class
➢ Character class
➢ Byte class
➢ Short class
➢ Integer class
➢ long class
➢ Float class
➢ Double class
➢ Boolean class

15. The collection Framework

- ➢ Understanding Collection Framework
- ➢ Array of object as Collection
- ➢ Collection Objects
  - Sets
  - Lists
  - Queues
  - Maps
- ➢ Retrieving Elements from Collection Objects
  - For-each
  - Iteration Interface
  - ListIteration Interface
  - Enumeration Interface
- ➢ HashSet class
- ➢ LinkedHashSet class
- ➢ Stack class
- ➢ LinkedList class
- ➢ ArrayList class
- ➢ Vector class
- ➢ HashMap class
- ➢ HashTable class
- ➢ Calendar class
- ➢ Data class

16. Streams & Files

- ➢ Understanding Stream
- ➢ File handiling
  - FileOutputStream
  - FileInputStream
  - FileWritter
  - FileReader
- ➢ Zip & UnZip the files
- ➢ File class

17. Networking in Java

- ➢ Understanding networks
- ➢ TCP/IP protocol
- ➢ User Data-gram Protocols
- ➢ socket programming
  - Knowing IP Address
  - URL class
  - creating server & client
  - server client talks
  - file sharing

18. Threads

- ➢ Understanding process & Threads

JAVA

➢ Thread Life Cycle
➢ Multi-threaded in java
➢ Multiple Threads Acting on Single Object
➢ Thread Class Methods
➢ Deadlock of Threads
➢ Daemon Threads
➢ Applications of Thread

19. Graphics programming

➢ GUI
➢ draw with frames
➢ AWT vs Swing
➢ frames
➢ Layouts
  - flow layout
  - Border layout
  - Card Layout
  - Grid Layout
  - GridBagLayout
  - BoxLayout
➢ swing widgets
  - Jbutton
  - Jlabel
  - JtextField
  - JtextArea
  - JpasswordField
  - JcheckBox
  - JradioButton
  - Jlist
  - JComboBox
  - JMenu
➢ Event handing with interfaces
➢ creating own GUI Desktop app.

PYTHON

1. Introduction to Python

➢ Python Overview
➢ History
➢ versions of Python
➢ Features of Python
➢ installing Python
➢ Create first program in Python
  • using shell scripting   • using text editor
➢ Innards of Python
  • Python   • Byte Code   • program
    Interpreter   execution
➢ Comparison of Python
  • java   • JavaScript
  • c++   • Perl

2. Dawn with Core

➢ Comments
➢ Variables
➢ Data Types
  • Numeric Data Type
    ➢ Integer   ➢ float   ➢ complex
  • Boolean Data Type
    ➢ boolean
  • Compound Data Type
    ➢ string   ➢ Dictionari
    ➢ list   es
    ➢ tuple   ➢ set
➢ keywords
➢ Print & input function
➢ Type casting
  • implicit   • explicit
➢ pip
➢ clrprint module

3.   Operators & Operands

➢ Operators & Operands
➢ Types of Operators
  ● Arithmetic   ● Bitwise
  ● Relational   ● Assignment
  ● Logical   ● Membership,Identity
➢ Precedence & associativity

4.   Control statements

➢ Boolean values
➢ Decision statements
  ● if statement   ● elif statement
  ● if … else statement   ● nested if statement
➢ Iteration control statement
  ● for loop
  ● while
  ● else clause with for & while loop
➢ flow control statements
  ● break   ● return
  ● continue   ● exit
➢ Pass statement

5.   String

➢ String
➢ ways to define a string
➢ accessing & slicing string
➢ immutable string
➢ string methods
➢ string formatting using
  ● % operator
  ● format()
➢ string operations
➢ string module
  ● constants   ● methods   ● templates

6. Array

- ➢ Array
- ➢ array with Array Module
  - • import in array
  - • declare array
  - • indexing & slicing
  - • operation on array
  - • Array methods
- ➢ array with numpy
  - • import numpy
  - • declare array
  - • declaring multi-dimension in numpy
  - • advance indexing & slicing
  - • Array operation
- ➢ Numpy array vs array

7. functions

- ➢ Function
- ➢ function header & body part
- ➢ function call
- ➢ return statement
- ➢ function parameter & arguments
  - • formal parameter & actual argument
  - • default argument
  - • keyword argument
  - • arbitrary argument
- ➢ Anonymous / lambda function
- ➢ scope of Varible
  - • local
  - • global
- ➢ Recursion
  - • base case in recusion
  - • advantage & disadvantages
- ➢ Modules
  - • creating used-defined module
  - • importing modules
  - • __main__
  - • use modules in other program

8. Data collection

- ➢ Understanding data collection

- ➢ list
    - list indexing & slicing
    - list operation
    - list methods
    - list mutable
- ➢ tuple
    - tuple indexing & slicing
    - tuple operation
    - tuple method
    - tuple immutable
- ➢ Set
    - set indexing & slicing
    - set operation
    - set methods
    - set mutable
- ➢ Dictionary
    - dictionary indexing & slicing
    - dictionary operation
    - dictionary method
    - dictionary mutable
- ➢ aliasing & cloning
- ➢ data collection with in another collection
- ➢ data structure using data collection

9. OOP with Python

- ➢ OOP
- ➢ class & object
- ➢ instance variables & instance methods
- ➢ constructor & destructor as magic method
- ➢ Types of Methods
    - instance method
    - class method
    - static method
- ➢ Privacy in python with access specifiers

10. Inheritance & Polymorphism

- ➢ Inheritance
    - super class & base class
    - single inheritance
    - multi-level inheritance
    - multiple inheritance
    - hierarchical Inheritance

- Hybrid inheritance
- constructions with inheritance
- Method Resolution Order
➢ Polymorphism
  - method overloading
  - Operator overload
  - method overriding

11. Abstract class & Interfaces

➢ Abstract Class
  - Abstract Base class
  - Abstract Method
➢ Interface
  - interface

12. Recursion

➢ Recursion with base case
➢ significance of recursion
➢ snags of Recursion

13. Numbers,Dates Time

➢ Numbers
  - Numeric types in python
  - Number type conversion
  - maths functions
  - Random module
  - Trigonometric fuction
➢ Date & Time
➢ datetime module
➢ date module
➢ time module

14. Regular Expressions

➢ Understanding Regular Expressions
➢ meta-characters
➢ regular Expression method
  - compile
  - match
  - split
  - search
  - findall

15. GUI

- ➢ GUI
- ➢ drawing with Turtle
- ➢ GUI with pyQt5
  - • layouts
  - • widgets
- ➢ Event handling

16. File Handling

- ➢ Text File & binary File
- ➢ file modes
  - • r
  - • b
  - • a
  - • r+
  - • w+
  - • a+
  - • rb
  - • wb
  - • ab
  - • rb+
  - • wb+
  - • ab+
- ➢ file operation
  - • create
  - • open
  - • close
  - • write
  - • read
  - • append
  - • tell
  - • seek
  - • rename
  - • remove
- ➢ Working with directories
  - • mkdir()
  - • getcwd()
  - • chdir()
  - • rmdir()
  - • glob()

17. Database with pymysql

- ➢ Database
- ➢ connection with database
- ➢ DDL queries
  - • Create
  - • alter
  - • drop
  - • rename
  - • truncate
- ➢ DQL query
  - • select
- ➢ DML queries
  - • insert
  - • update
  - • delete
- ➢ ACID properties in Transactions

18. Exception handling

- ➢ Errors & exceptions
- ➢ Exception
  - Build-in Exception
  - user-defined exception
- ➢ Try-except block
- ➢ multiple except blocks
- ➢ pass statement in try-except
- ➢ else clause in try-except
- ➢ finally block
- ➢ user-defined exception

19. Socket programming

- ➢ Sockets
- ➢ TCP/IP model
- ➢ creating server/client with communicating
- ➢ Executing server client

20. Thread

- ➢ Process & thread
- ➢ thread life cycle
- ➢ Threads
  - creating thread
  - creating multiple threads
- ➢ threading module