

Class : 12Register
Number**SECOND REVISION EXAMINATION - 2024**

Time Allowed : 3.00 Hours]

COMPUTER SCIENCE

[Max. Marks : 70

PART - I

Note : i) All the questions.

15X1 = 15

ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. The function which cause side effects to the arguments passed are called
 - a) impure
 - b) partial
 - c) dynamic
 - d) pure
2. The process of binding a variable name with an object is called
 - a) mapping
 - b) definition
 - c) late binding
 - d) none
3. Which sorting algorithm needs minimum number of swaps
 - a) insertion
 - b) selection
 - c) bubble
 - d) none
4. The python prompt indicates that interpreter is ready to accept instruction.
 - a) >>>
 - b) <<
 - c) >>
 - d) <<<
5. Which operator is also called conditional operator.
 - a) Logical
 - b) assignment
 - c) Ternary
 - d) none
6. Which is the most comfortable loop.
 - a) For
 - b) While
 - c) if
 - d) if..elif
7. Which function is called anonymous un- named function.
 - a) Recursion
 - b) built in
 - c) Lambda
 - d) none
8. Strings in python.
 - a) changeable
 - b) mutable
 - c) immutable
 - d) flexible
9. Which of the following function is used to count the no of elements in a list
 - a) Len ()
 - b) find ()
 - c) count()
 - d) index
10. Function defined inside a class is called as.
 - a) module
 - b) section
 - c) function
 - d) Methods
11. A Tuple is also known as
 - a) Row
 - b) field
 - c) column
 - d) Table
12. The command to delete a Table
 - a) Delete
 - b) Drop
 - c) Del
 - d) none
13. A CSV file is also known as
 - a) 3D file
 - b) String
 - c) Flat file
 - d) file
14. Which of the following is not a scripting language.
 - a) HTML
 - b) JAVASCRIPT
 - c) PERL
 - d) PHP
15. Which is a python package used for 2 D graphics ?
 - a) matplotlib.pyplot
 - b) matplotlib.pyp
 - c) matplotlib.numpy
 - d) matplotlib.plt

PART - II

Answer any six questions. Question No. 24 is compulsory.

6x2=12

16. What is subroutine?
17. Define pseudocode?

KK/12/C.S/1

18. Define Keywords? Give examples.
19. Write the syntax of if..else statement
20. What is string?
21. What will be the output of the following code?

```
Str = "COMPUTER"
Print (Str *3)
```
22. Write short note on SELECT command?
23. Define : data visualization.
24. Write the expansion of SWIG and MinGW.

PART - III

Answer any six questions. Question No. 33 is compulsory.

6x3=18

25. What is Recursive function?
26. Explain Ternary operator with example?
27. Differentiate break and continue statement.
28. Write a Python Program to display the following pattern.

```
A
AB
ABC
ABCD
ABCDE
```
29. What are the advantages of Tuples over a List?
30. List out the set operations.
31. What is a constraint ? write short note on primary key constraint.
32. What is the difference between the write mode and append mode.?
33. Differentiate PYTHON and C++

PART - IV

Answer All questions .

5x5=25

34. a) Explain the types of Scopes (LEGB rule)
 (OR)
 b) Explain the characteristics of an algorithm
35. a) Discuss in detail about Tokens in Python
 (OR)
 b) Write a detail note on while Loop.
36. a) Explain about string operations in python with examples.
 (OR)
 b) Explain the different types of data model.
37. a) Explain the characteristics of DBMS.
 (OR)
 b) Differentiate EXCEL file and CSV file.
38. a) What are the components of SQL ? write the commands in each.
 (OR)
 b) Explain the various buttons in a matplotlib window.

KK/12/C.S/2

**MOUNT CARMEL MISSION MATRIC HIGHER SECONDARY SCHOOL – KALLAKURICHI
SECOND REVISION EXAM – 2024 [ANSWER KEY]**

CLASS: XII
SUB: COMPUTER SCIENCE

MARKS: 70
TIME: 3 : 00 Hrs

PART – I

I. CHOOSE THE CORRECT ANSWER:

15 X 1 = 15

- | | |
|-----------------|--------------------------|
| 1. a) impure | 11. a) row |
| 2. a) mapping | 12. b) drop |
| 3. b) selection | 13. c) flat file |
| 4. a) >>> | 14. a) HTML |
| 5. c) ternary | 15. a) matplotlib.pyplot |
| 6. a) for | |
| 7. c) lambda | |
| 8. c) immutable | |
| 9. a) len() | |
| 10. d) methods | |

PART – II

II. ANSWER ANY SIX QUESTIONS. Q.No: 24 IS COMPULSORY:

6 X 2 = 12

16. What is subroutine?

- Ans:** - Subroutines are the basic building blocks of computer programs.
- Subroutines are small sections of code that are used to perform a particular task that can be used repeatedly.

17. Define pseudocode.

- Ans:** - Pseudo code is a mix of programming - language - like constructs and plain English.
- Pseudo code is a notation similar to programming languages. Algorithms expressed in pseudo code are not intended to be executed by computers, but for communication among people.

18. Define Keywords? Give examples.

- Ans:** - Keywords are special words used by Python to convey specific meaning for interpreter. They cannot be used for any other purpose.
Example: break, return, if etc.,

19. Write the syntax of if..else statement.

Ans: SYNTAX:
if <condition>:
 statement-block 1
else:
 statement-block 2

20. What is string?

- Ans:** - String is a data type in Python, which is used to handle array of characters.
- The sequence of character may be a combination of letters, numbers, or special symbols enclosed within single, double or even triple quotes.

21. What will be the output of the following code?

```
str = "COMPUTER"
print(str*3)
Ans: COMPUTERCOMPUTERCOMPUTER
```

22. Write short note on SELECT command?

- Ans:** - SELECT is the most commonly used statement in SQL.
 - SELECT statement in SQL is used to retrieve or fetch data from a table in a database.
 - All the table data can be fetched in an object in the form of list of lists.

Syntax: "Select * from table_name"

Example: "Select * from student" (**NOTE:** student – is table name)

23. Define: Data Visualization.

Ans: Data Visualization is the graphical representation of information and data. The objective of Data Visualization is to communicate information visually to users. For this, data visualization uses statistical graphics. Numerical data may be encoded using dots, lines, or bars, to visually communicate a quantitative message.

24. Write the expansion of SWIG and MinGW.

- Ans:** - **SWIG** – Simplified Wrapper Interface Generator
 - **MinGW** – Minimalist GNU for Windows

PART – III**III. ANSWER ANY SIX QUESTIONS. Q. No: 33 IS COMPULSORY:****6 X 3 = 18****25. What is Recursive function?**

- Ans: Recursive function:** When a function calls itself is known as recursion.
 - Recursion works like loop but sometimes it makes more sense than loop.
 - It is possible to convert any loop to recursion.
 - A base condition is must in every recursive function.

Syntax:

```
def <functionname(parameter1, parameter2...>:
  <Block of statements with Base case and Recursive case>
  Return <expression/None>
```

Example:

```
def fact(n):
    if n == 0:
        return 1
    else:
        return n * fact ( n - 1 )
print( fact (5) )
```

OUTPUT:

120

26. Explain Ternary operator with example?

- Ans:** - Ternary operator is also known as conditional operator.
 - It evaluates something based on a condition being true or false.
 - It replaces the multiline if-else making the code compact.

Syntax:

Variable name = [on_true] if [Test expression] else [on_false]

Example:

```
min = 50 if 49<50 else 70 # min = 50
```

```
min = 50 if 49>50 else 70 # min = 70
```

27. Differentiate break and continue statement.**Ans:**

Break statement	Continue statement
The break statement terminates the loop	Continue statement unlike the break statement is used to skip the remaining part of a loop.
Control of the program flows to the statement immediately after the body of the loop.	It starts with the next iteration.
Syntax: Break	Syntax: continue

28. Write a Python Program to display the following pattern.

```
A
A B
A B C
A B C D
A B C D E
```

Ans: for i in range(1, 6, 1):

```
    for j in range(65, 65+i, 1):
```

```
        alpha = chr(j)
```

```
        print(alpha,end= ' ')
```

```
    print('\n')
```

s = "A B C D E"

for i in range(1, len(s)+1,2):

(OR)

print(s[0:i])

29. What are the advantages of Tuples over a List?

Ans: - The elements of a list are changeable (mutable) whereas the elements of a tuple are unchangeable (immutable), this is the key difference between tuples and list.

- The elements of a list are enclosed within square brackets. But, the elements of a tuple are enclosed by parenthesis.

- Iterating tuples is faster than list.

30. List out the set operations.**Ans:**

Operation	Operator	Description
Union		It includes all elements from two or more sets
Intersection	&	It includes the common elements in two sets
Difference	-	It includes all elements that are in first set (say set A) but not in the second set(say set B)
Symmetric difference	^	It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.

31. What is a constraint? Write short note on primary key constraint.

Ans: Constraint is a condition applicable on a field or set of fields. Constraints are used to limit the type of data that can go into a table.

Primary Key Constraint: This constraint declares a field as a Primary key which helps to uniquely identify a record. The primary key does not allow **NULL** values.

Example:

```
CREATE TABLE student
(
  Admno integer PRIMARY KEY, ———> Primary Key constraint
  Sname char(20) NOT NULL
);
```

Result:

i. The above command creates a table with fields Admno and Sname

Admno	Sname
.	.
.	.
.	.

- ii. Admin field do not allow duplicate entries and cannot be NULL.
iii. Sname field cannot be NULL.

32. What is the difference between the write mode and append mode?

Ans:

Write mode	Append mode
'w' write mode overwrites if the file already exists.	'a' append mode adds the data at the end of the file if the file already exists.
Always writes the data from the beginning of the new file.	Keeps the record pointer at the end of the file if file already exists.

33. Differentiate PYTHON and C++

Ans:

Python	C++
Python is typically an "interpreted" language.	C++ is typically a "compiled" language.
Python is a dynamic-typed language.	C++ is compiled statically typed language.
Data type is not required while declaring.	Variable Data type is required while declaring variable.
It can act both as scripting and general purpose language.	It is a general purpose language.

PART – IV

IV. ANSWER ALL QUESTIONS:

5 X 5 = 25

34. a) Explain the types of Scopes (LEGB rule)

Ans: There are 4 types of Variable Scope:

- Local Scope - Global Scope - Enclosed Scope - Built-in Scope

- **Local Scope:** Local scope refers to variables defined in current function. Always, a function will first look up for a variable name in its local scope. Only if it does not find it there, the outer scopes are checked.

Example:

Code	Entire program	Output of the Program
1. Disp():		7
2. a:=7		
3. print a		
4. Disp()		

On execution of the above code the variable a displays the value 7, because it is defined and available in the local scope.

- **Global Scope:** A variable which is declared outside of all the functions in a program is known as global variable. This means, global variable can be accessed inside or outside of all the functions in a program.

Example:

Code	Entire program	Output of the Program
1. a:=10		7 10
2. Disp():		
3. a:=7		
4. print a		
5. Disp()		
6. print a		

On execution of the above code the variable a which is defined inside the function displays the value 7 for the function call Disp() and then it displays 10, because a is defined in global scope.

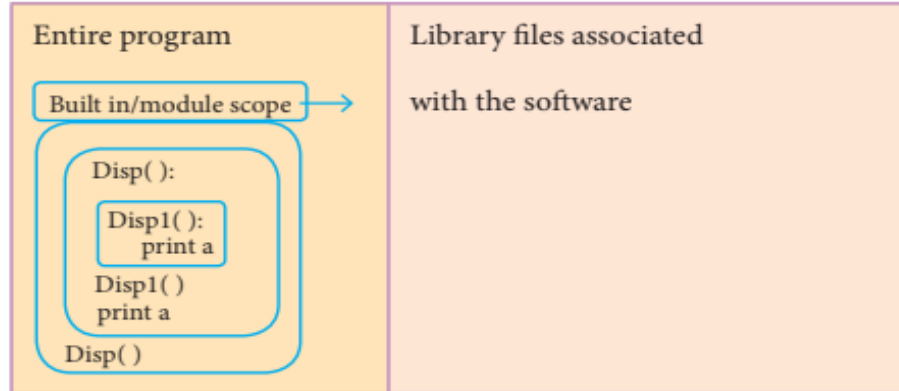
- **Enclosed Scope:** A variable which is declared inside a function which contains another function definition with in it, the inner function can also access the variable of the outer function. This scope is called enclosed scope.

Example:

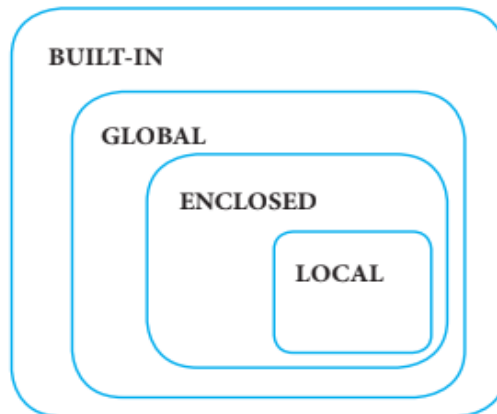
Code	Entire program	Output of the Program
1. Disp():		10 10
2. a:=10		
3. Disp1():		
4. print a		
5. Disp1()		
6. print a		
7. Disp()		

In the above example Disp1() is defined with in Disp(). The variable 'a' defined in Disp() can be even used by Disp1() because it is also a member of Disp().

- **Built-in Scope:** Built-in the widest scope. The built-in scope has all the names that are pre-loaded into the program scope when we start the compiler or interpreter. Any variable or function which is defined in the modules of a programming language has Built-in or module scope. They are loaded as soon as the library files are imported to the program.



Local(L)	Defined inside function/class
Enclosed(E)	Defined inside enclosing functions (Nested function concept)
Global(G)	Defined at the uppermost level
Built-in (B)	Reserved names in built-in functions (modules)



[OR]

b) Explain the characteristics of an algorithm.

Ans: - An algorithm is a finite set of instructions to accomplish a particular task.

- Algorithms must have input, output and should satisfy the following characteristics such as definiteness, correctness and effectiveness.

Characteristics of an Algorithm:

- An algorithm should have the following characteristics:

Input	Zero or more quantities to be supplied.
Output	At least one quantity is produced.
Finiteness	Algorithms must terminate after finite number of steps.
Definiteness	All operations should be well defined. For example operations involving division by zero or taking square root for negative number are unacceptable.
Effectiveness	Every instruction must be carried out effectively.
Correctness	The algorithms should be error free.
Simplicity	Easy to implement.
Unambiguous	Algorithm should be clear and unambiguous. Each of its steps and their inputs/outputs should be clear and must lead to only one meaning.
Feasibility	Should be feasible with the available resources.
Portable	An algorithm should be generic, independent of any programming language or an operating system able to handle all range of inputs.
Independent	An algorithm should have step-by-step directions, which should be independent of any programming code.

35. a) Discuss in detail about Tokens in Python.

Ans: Python breaks each logical line into a sequence of elementary lexical components known as Tokens. The normal token types are

- 1) Keywords
 - 2) Identifiers
 - 3) Literals
 - 4) Delimiters
 - 5) Operators
- (Pneumonic: KILDO)

1) Keywords:

Keywords are special words used by Python interpreter to recognize the structure of program. As these words have specific meaning for interpreter, they cannot be used for any other purpose.

Example: break, return, if etc.,

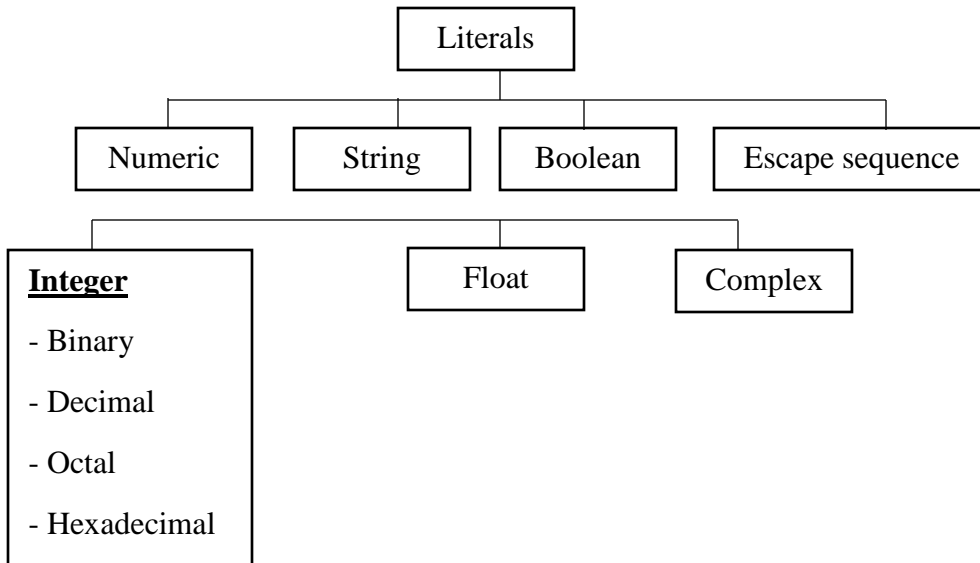
2) Identifiers:

- An Identifier is a name used to identify a variable, function, class, module or object.
- An identifier must start with an alphabet (A..Z or a..z) or underscore (_).
- Identifiers may contain digits (0 .. 9)
- Python identifiers are case sensitive i.e. uppercase and lowercase letters are distinct.
- Identifiers must not be a python keyword.
- Python does not allow punctuation character such as %, \$, @ etc., within identifiers.

Example: Sum, total_marks, regno, num1

3) Literals:

Literal is a raw data given to a variable or constant. In Python, there are various types of literals.



Numeric Literals: Numeric Literals consists of digits and are immutable (unchangeable). Numeric literals can belong to 3 different numerical types Integer, Float and Complex.

Example:

```

a = 0b1010    #Binary Literals
b = 100       #Decimal Literal
c = 0o310    #Octal Literal
d = 0x12c    #Hexadecimal Literal
float_1 = 10.5 #Float Literal
float_2 = 1.5e2
x = 1 + 3.14j #Complex Literal
  
```

String Literals: A string literal is a sequence of characters surrounded by quotes. Python supports single, double and triple quotes for a string. The value with triple-quote ''' ''' is used to give multi-line string literal.

Example:

```

strings = "This is Python"
char = "C"
multiline_str = "This is a multiline string"
  
```

Boolean Literals: A Boolean literal can have any of the two values: True or False.

- boolean_1 = True
- boolean_2 = False

Escape Sequences: The backslash "\" is a special character, also called the "escape" character. It is used in representing certain whitespace characters.

Example:

“\t” is a tab, “\n” is a newline and “\r” is a carriage return.

4) **Delimiters:** Delimiters are sequence of one or more characters used to specify the boundary between separate, independent regions in plain text or other data streams.

Example: () ; : = . ,

5) **Operators:**

- Operators are special symbols which represent computations, conditional matching etc.
- Operators are categorized as Arithmetic, Relational, Logical, Assignment etc.

- Arithmetic operators: +, -, *, /, **, %, //
- Relational operators: >, <, >=, <=, ==, !=
- Logical operators: and, or, not
- Assignment operators: =, +=, -=, *=, /=
- Conditional operators: Variable Name = [on_true] if[Test expression] else [on_false]

[OR]

b) Write a detail note on while loop.

Ans: While loop repeats a code block until the given condition becomes false.

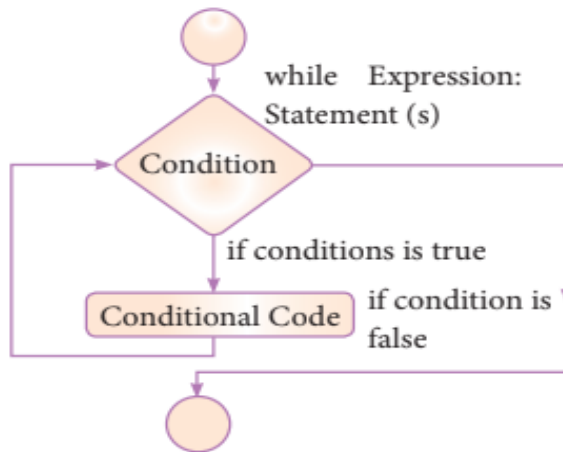
Syntax:

```
while <condition>:
    statements block1
[else:
    Statements block2]
```

Where

- condition – Any valid Boolean expression returning True or False
- The else part of while is optional part of while

Flowchart representation:



Execution: The statements block1 is kept executed till the condition is True. If the else part is written, it is executed when the condition is tested False. Recall while loop belongs to entry check loop type, that is it is not executed even once if the condition is tested False in the beginning.

Example:

```
# program to illustrate the use of while loop - to print all numbers from 10 to 15
i=10          # initializing part of the control variable
while (i<=15): # test condition
print (i,end='\t') # statements - block 1
i=i+1        # Updation of the control variable
```

Output:

10 11 12 13 14 15

36. a) Explain about string operations in python with examples.

Ans: Python provides the following operators for string operations. These operators are useful to manipulate string.

Operation	Operator	Description	Example
Concatenation	(+)	- Joining of two or more strings is called as Concatenation. - The plus (+) operator is used to concatenate strings in python.	>>> "welcome" + "Python" welcomePython
Append	(+=)	- Adding more strings at the end of an existing string is known as append. - The operator += is used to append a new string with an existing string.	>>> str1="Welcome to " >>> str1+="Learn Python" >>> print (str1) Welcome to Learn Python
Repeating	(*)	- The multiplication operator (*) is used to display a string in multiple number of times.	>>> str1="Welcome" >>> print (str1*2) Welcome Welcome
String slicing	[:]	- Slice is a substring of a main string. - A substring can be taken from the original string by using [] operator and index or subscript values. - [] is also known as slicing operator. Which is used to slice one or more substrings from a main string.	>>> str1="THIRUKKURAL" >>>print(str1[:5]) THIRU >>>print(str1[6:]) KURAL >>>print(str1[3:7]) RUKK
Stride when slicing string	[: :]	- It is the slicing operation with a third argument as stride. - It refers to the number of characters to move forward after the first character is retrieved from the string. - The default value of stride is 1.	>>>str1 = "Welcome to Python" >>>print(str1[11:15:3]) Ph >>>print(str1[::2]) Wloet yhn >>>print(str1[::-1]) nohtyP ot emocleW

[OR]

b) Explain the different types of data model.

Ans: A data model describes how the data can be represented and accessed from a software after complete implementation

- It is a simple abstraction of complex real world data gathering environment.
- The main purpose of data model is to give an idea as how the final system or software will look like after development is completed.

Types of Data Model

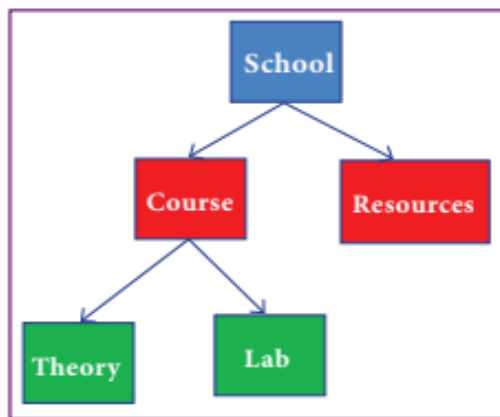
Following are the different types of a Data Model

- Hierarchical Model
- Relational Model
- Network Database Model
- Entity Relationship Model
- Object Model

i. Hierarchical Model:

Developed by : IBM as Information Management System.
 Data representation : Simple tree like structure form.
 Relationship : One-to-many relationship
 Parent-child relationship : One child can have only one parent but one parent can have many children.
 Usage : This model is mainly used in IBM Main Frame computers.

Example:



ii. Relational Model:

Proposed by : E.F. Codd in 1970.
 Usage : Nowadays, it is the most widespread data model used for database applications around the world.
 Data representation : - The basic structure of data in relational model is tables (relations).
 - All the information's related to a particular type is stored in rows of that table.
 - Hence tables are also known as relations in a relational model.
 - A relation key is an attribute which uniquely identifies a particular tuple (row in a relation (table)).

Example:

Stu_id	Name	Age	Subj_id	Name	Teacher
1	Malar	17	1	C++	Kannan
2	Suncar	16	2	Php	Ramakrishnan
3	Velu	16	3	Python	Vidhya

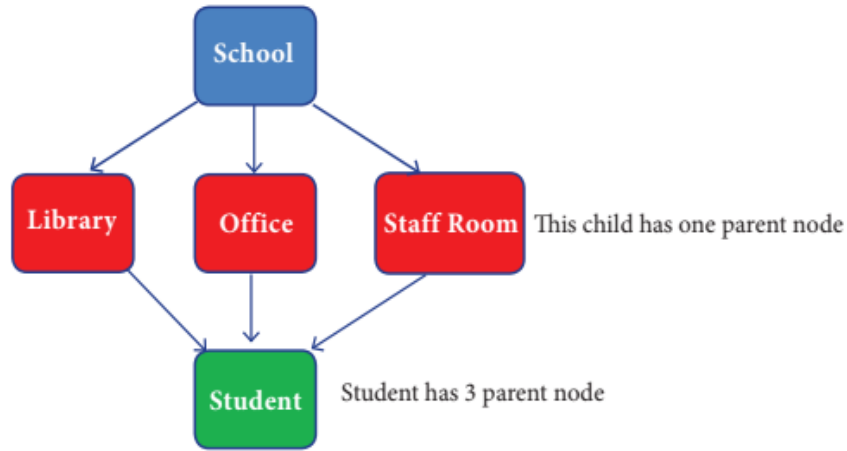
Stu_id	Subj_id	Marks
1	1	92
1	2	89
3	2	96

iii. Network Model: Network database model is an extended form of hierarchical data model. The difference between hierarchical and Network data model is:

- In hierarchical model, a child record has only one parent node. But, in a Network model, a child may have many parent nodes.

Relationship : many-to-many

Advantage : This model is easier and faster to access the data.



iv. Entity Relationship Model: (ER Model)

In this database model, relationship are created by dividing the object into entity and its characteristics into attributes.

Developed by : Chen in 1976.

Advantages:

- Useful in developing a conceptual design for the database.
- Simple and easy to design logical view of data.
- Easy to understand the system by looking at ER model constructed.

Symbol	Represents	Example(s)
Rectangle	Entities	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Doctor</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Patient</div> </div>
Ellipse	Attributes	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">P-id</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">P-Name</div> </div>
Diamond	Relationship	<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto; transform: rotate(45deg); display: flex; align-items: center; justify-content: center;"> Diagnosis </div>

Example: Doctor diagnosis the patient

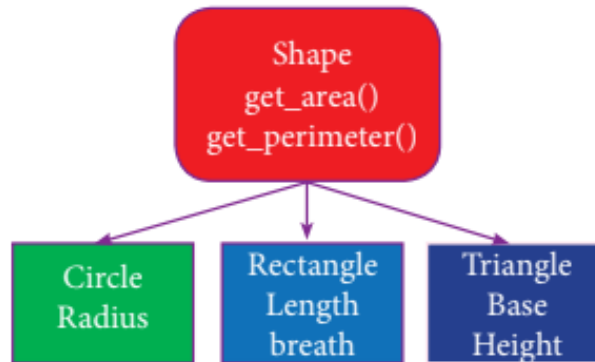


v. Object Model:

Object model stores the data in the form of objects, attributes and methods, classes and Inheritance.

Advantages:

- Object model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing.
- Object model is used in file Management System.
- Object model represents real world objects, attributes and behaviors.
- Object model provides a clear modular structure.
- Object model is easy to maintain and modify the existing code.

Example:**37. a) Explain the characteristics of DBMS.**

Ans:

1. Ability to manipulate Data	DBMS provides the facility to manipulate data (store, modify and delete) in a data base.
2. Reduced Redundancy	In the modern world hard drives are very cheap, but earlier when hard drives were too expensive, unnecessary repetition of data in database was a big problem But DBMS follows Normalisation which divides the data in such a way that repetition is minimum.
3. Data Consistency	On live data, it is being continuously updated and added, maintaining the consistency of data can become a challenge. But DBMS handles it by itself.
4. Support Multiple user and Concurrent Access	DBMS allows multiple users to work on it (update, insert, delete data) at the same time and still manages to maintain the data consistency.
5. Query Language	DBMS provides users with a simple query language, using which data can be easily fetched, inserted, deleted and updated in a database.
6. Security	The DBMS also takes care of the security of data, protecting the data from unauthorized access. In a typical DBMS, we can create user accounts with different access permissions, using which we can easily secure our data by restricting user access.
7. DBMS Supports Transactions	It allows us to better handle and manage data integrity in real world applications where multi-threading is extensively used.

[OR]

b) Differentiate EXCEL file and CSV file.

Ans:

Excel	CSV
Excel is a binary file that holds information about all the worksheets in a file, including both content and formatting	CSV format is a plain text format with a series of values separated by commas.
XLS files can only be read by applications that have been especially written to read their format, and can only be written in the same way.	CSV can be opened with any text editor in Windows like notepad, MS Excel, OpenOffice, etc.
Excel is a spreadsheet that saves files into its own proprietary format viz. xls orxlsx	CSV is a format for saving tabular information into a delimited text file with extension .csv
Excel consumes more memory while importing data	Importing CSV files can be much faster, and it also consumes less memory
All Excel files cannot be converted to CSV format as some Excel file may contain graphics and other objects.	All CSV files can be converted to Excel format without information loss.

38. a) What are the components of SQL? Write the commands in each.







Ans:

Type	Expansion	Usage	Commands
DDL	Data Definition Language	Commands used to define the database structure and schema	Create Drop Truncate Alter Table
DML	Data Manipulation Language	It is a query language used for adding (inserting), removing (deleting), modifying (updating) data in a database.	Insert Update Delete
DCL	Data Control Language	Commands used to control the access of data stored in a database.	Grant Revoke
TCL	Transaction Control Language	Commands used to manage transactions in the database.	Commit Roll back Save point
DQL	Data Query Language	Commands used to get desired results from the database tables.	Select

[OR]

b) Explain the various buttons in a matplotlib window.

Ans:

Icons	Button	Description
	Home	click this.to return back to the original view.
	Forward/Back	Forward → Move to a forward point. Back → Move to a previous point.
	Pan Axis	To click and drag the graph.
	Zoom	To zoom <ul style="list-style-type: none"> • Select by click and drag on the graph. • Left click and drag → Zoom in the selected area • Right click and drag → Zoom out the selected area
	Configure Subplots	To configure various spacing options with your figure and plot.
	Save Figure	This button will allow you to save your figure in various forms.

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