

# Loyola



# EC COMPUTER SCIENCE

# 12

This special guide is prepared  
on the basis of New Syllabus  
and Govt. Key

## Loyola

### Publications

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## PREFACE

“Loyola Computer Science “ is in your hands.

Students with average IQ always struggle to cope up studies. They always seek for the best, sources to learn and score high marks.

The pattern of the question being asked in the exams has changed dramatically and the difficulty level has also increased considerably. To succeed in board exams and to actualize your dream, you are required to prepare strategically and study in a focused manner.

This book gives important tips which covers the entire chapter.

Loyola serves the above cited purpose in perfect manner.

- Specially designed for coaching students of different levels.  
**(Slow learners, average and Topper students)**
- Lot of additional questions are given for toppers
- The “EC Computer Science” is prepared with due care on the lines of the Govt. Examination Valuation, the easy method of studying, the lesson and the perfect way of answering the questions.
- The answers are well prepared, briefly and easily for the students to study without any difficulty and stress.
- Simplified text matter
- Focused on coverage of textbook.
- MCQ's are framed based on new pattern.
- Included PTA questions and Govt. question papers with their key.
- Comprehensive questions are designed for average and above average students based on key points.

*Wish you All the Best*

Loyola Publication





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## CHAPTER - 1

# FUNCTION

### FUNCTIONS - An Overview

#### Expression of Algorithm:

- Algorithms are expressed using statements of a programming language

#### Subroutine:

- Subroutines are small sections of code that are used to perform a particular task that can be used repeatedly.

#### Function :

- A function is a unit of code that is often defined within a greater code structure.
- A function contains a set of code that works on many kinds of inputs and produces a concrete output.

#### Definition:

- Definitions are distinct syntactic blocks.

#### Parameters:

- Parameters are the variables in a function definition.

#### Argument:

- Arguments are the values which are passed to a function definition through the function definition.

#### Object:

An object is an **instance created from the class**.

#### Interface:

- An interface is a set of action that an object can do.
- Interface just defines what an object can do, but won't actually do it.

#### Implementation:

- Implementation carries out the instructions defined in the interface.

#### Pure functions:

- Pure functions are functions which will give exact result when the same arguments are passed.

#### Impure function:

- The functions which cause side effects to the arguments passed are called Impure function.

#### Recursive function:

- A function definition which calls itself is called recursive function.

### PART - I TEXT BOOK EVALUATION

#### PART - I

#### Choose the best answer (1 Mark)

- The small sections of code that are used to perform a particular task is called Mar 2023
  - Subroutines
  - Files
  - Pseudo code
  - Modules

Ans : a) Subroutines
- Which of the following is a unit of code that is often defined within a greater code structure? Aug 2022
  - Subroutines
  - Function
  - Files
  - Modules

Ans : b) Function
- Which of the following is a distinct syntactic block? May 2022
  - Subroutines
  - Function
  - Definition
  - Modules

Ans : c) Definition

4. The variables in a function definition are called as  
 a) Subroutines      b) Function      c) Definition      d) Parameters  
**Ans : d) Parameters**
5. The values which are passed to a function definition are called  
 a) Arguments      b) Subroutines      c) Function      d) Definition  
**Ans : a) Arguments**
6. Which of the following are mandatory to write the type annotations in the function definition  
 a) {}      b) ()      c) []      d) < >  
**Ans : b) ()**
7. Which of the following defines what an object can do?  
 a) Operating System      b) Compiler      c) Interface      d) Interpreter  
**Ans : c) Interface**
8. Which of the following carries out the instructions defined in the interface?  
 a) Operating System      b) Compiler      c) Implementation      d) Interpreter  
**Ans : c) Implementation**
9. The functions which will give exact result when same arguments are passed are called  
**March 2020**  
 a) Impure functions      b) Partial Functions      c) Dynamic Functions      d) Pure functions  
**Ans : d) Pure functions**
10. The functions which cause side effects to the arguments passed are called  
 a) Impure functions      b) Partial Functions      c) Dynamic Functions      d) Pure functions  
**Ans : a) Impure functions**

## PART - II

## Answer the following questions (2 Marks)

1. What is a subroutine? **PTA - 1**  
 • 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.  
 • In Programming languages, these **subroutines** are called **Functions**.
2. Define Function with respect to Programming language.  
 • A function is a **unit of code** that is often defined within a greater code structure.  
 • A function works on many kinds of inputs like variants, expressions and produces a **concrete output**.
3. Write the inference you get from X:=(78).  
 • Definitions are **distinct syntactic blocks**.  
 • Definitions can have **expressions nested inside them**, and vice-versa.  
 • In X:=(78),(78) is a **function definition** which **binds the value 78** to the name 'X'.
4. Differentiate interface and implementation. **PTA - 3**

Interface	Implementation
Interface defines what an object can do, but won't actually do it	Implementation carries out the instructions defined in the interface

5. Which of the following is a normal function definition and which is recursive function definition

i) let sum xy:  
return x +y

**Recursive Function**

ii) let disp:  
print 'welcome'

**Normal Function**

iii) let rec sum num:  
if (num!=0) then return num + sum (num-1)  
else  
return num

**Recursive Function**

**PART - III**

**Answer the following questions (3 Marks)**

1. Mention the characteristics of Interface.

**Mar 2023**

- The class template specifies the interfaces to enable an object to be created and operated properly.
- An object's attributes and behaviour is controlled by sending functions to the object.

2. Why strlen is called pure function?

- Pure functions are functions which will give exact result when the same arguments are passed.
- **strlen()** is a pure function because the function takes one variable as a parameter, and accesses it to find its length.
- This function reads external memory but does not change it, and the value returned derives from the external memory accessed.

3. What is the side effect of impure function. Give example.

- Impure function has side effects when it has observable interaction with the outside world.
- The variables used inside the function may cause side effects through the functions which are not passed with any arguments. In such cases the function is called impure function.
- When a function depends on variables or functions outside of its definition block, you can never be sure that the function will behave the same every time it's called.
- For example, the mathematical function random() will give different outputs for the same function call.

**let Random number**

**let a: = random ()**

**if a > 10 then**

**return : a**

**else**

**return: 10**

Here the function **random** is impure as it is not sure what will be the result when we call the function.

## 4. Differentiate pure and impure function.

March 2020 PTA - 6

	Pure Function	Impure Function
1	The return value of the pure functions solely depends on its arguments passed.	The return value of the impure functions does not solely depend on its arguments passed..
2	Pure functions with the same set of arguments always return same values.	Impure functions with the same set of arguments may return different values.
3	They do not have any side effects.	They have side effects.
4	They do not modify the arguments which are passed to them	They may modify the arguments which are passed to them
5	Example: <code>strlen(),sqrt()</code>	Example: <code>random(),date()</code>

## PART - IV

## Answer the following questions (5 Marks)

## 1. What are called Parameters and write a note on

PTA - 2 May 2022

## i) Parameter without Type

## ii) Parameter with Type

## Parameters :

- Parameters are the **variables** in a function definition.

## Arguments:

- Arguments are the **values** which are passed to a function definition.

Parameters passing are of two types namely

- Parameter Without Type
- Parameter With Type

## i) Parameter without Type:

Let us see an example of a function definition.

```
(requires: b >=0)
(returns: a to the power of b)
let rec pow a b:=
    if b=0 then 1
    else a*pow a(b-1)
```

- In the above function definition variable 'b' is the parameter and the

value which is passed to the variable 'b' is the argument.

- The precondition (**requires**) and post condition (**returns**) of the function is given.
- Note we have not mentioned any types (**data types**).
- Some language computer solves this type (**data type**) inference problem algorithmically, but some require the type to be mentioned.

## ii). Parameter with Type:

Now let us write the same function definition with types for some reason:

```
(requires: b > 0)
```

```
(returns: a to the power of b)
```

```
let rec pow (a: int) (b: int) : int :=
```

```
if b=0 then 1
```

```
else a * pow b (a-1)
```

- When we write the type annotations for 'a' and 'b' the parentheses are mandatory.
- There are times we may want to explicitly write down types.
- This useful on times when you get a type error from the compiler that doesn't make sense.
- Explicitly annotating the types can help with debugging such an error message.



## 2. Identify in the following program

PTA - 5

```
let rec gcd a b :=
  if b <> 0 then gcd b (a mod b)
  else return a
```

- i) Name of the function  
**gcd**
- ii) Identify the statement which tells it is a recursive function  
**let rec gcd a b:=**  
**"rec" keyword tells the compiler it is a recursive function**
- iii) Name of the argument variable  
**a and b**
- iv) Statement which invoke the function recursively  
**gcd b (a mod b)**
- v) Statement which terminates the recursion  
**return a**

## 3. Explain with example Pure and impure functions.

**Pure functions:**

- Pure functions are functions which will give exact result when the same arguments are passed.
- For example, the mathematical function  $\sin(0)$  always results 0.

Let us see an example.

```
let square x
return: x * x
```

- The above function square is a pure function because it will not give different results for the same input.

**Impure functions:**

- The variables used inside the function may cause side effects though the functions which are not passed with any arguments. In such cases the function is called impure function.

- When a function depends on variables or functions outside of its definition block, we can never be sure that the function will behave the same every time it's called.
- For example, the mathematical functions random ( ) will give different outputs for the same function call.

**let Random number****let a := random()****if a > 10 then****return: a****else****return: 10**

- Here the **function Random is impure** as it is not sure what will be the result when we call the function.

## 4. Explain with an example interface and implementation.

**Interface:**

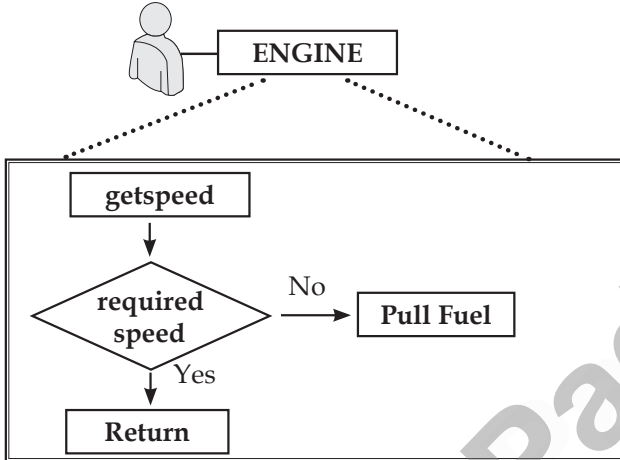
- An interface is a set of action that an object can do.
- In Object Oriented Programming language, an Interface is a description of all functions that a class must have in order to be a new interface.
- The purpose of interfaces is to allow the computer to enforce the properties of the class of **TYPE T** (whatever the interface is) must have functions called X, Y, Z, etc.
- A class declaration combines the external interface (its local state) with an implementation of that interface (the code that carries out the behaviour).
- An object is an instance created from the class.
- The interface defines an object's visibility to the outside world.
- In object oriented programs classes are the interface and how the object is processed and executed is the implementation.

**Characteristics of interface**

- The class template specifies the interfaces to enable an object to be created and operated properly.
- An object's attributes and behaviour is controlled by sending functions to the object.

**Interface: Vs Implementation:**

Interface	Implementation
Interface defines what an object can do, but won't actually do it	Implementation carries out the instructions defined in the interface

**Example :**

- The person who drives the car doesn't care about the internal working.
- To increase the speed of the car he just presses the accelerator to get the desired behaviour.
- Here the accelerator is the interface between the driver (the calling / invoking object) and the engine (the called object).
- In this case, the function call would be Speed (70): This is the interface.
- Internally, the engine of the car is doing all the things.
- It's where fuel, air, pressure, and electricity come together to create the power to move the vehicle.

All of these actions are separated from the driver, who just wants to go faster. Thus we separate interface from implementation.

**PART II - ADDITIONAL QUESTIONS****I. Choose the best answer (1 Mark)**

- The function definition is introduced by the keyword  
 a) def                      b) let                      c) rec                      d) requires    **Ans : b) let**
- The recursive function is defined using the keyword  
 a) let                      b) requires                      c) name                      d) let rec  
**Ans : d) let rec**
- A function definition which calls itself is called **PTA - 1**  
 a) user defined function                      b) recursive function  
 c) built-in function                      d) derived function  
**Ans : b) recursive function**
- All functions are \_\_\_\_\_ definitions.  
 a) datatype                      b) dynamic                      c) return                      d) static  
**Ans : d) static**



**III. Answer the following questions (5 Marks)****1. Explain the syntax of function definitions**

- The syntax to define functions is close to the mathematical usage.
- The definition is introduced by the keyword `let`, followed by the name of the function and its arguments; then the formula that computes the image of the argument is written after an `=` sign.
- If you want to define a recursive function: use **"let rec" instead of "let"**.

**Syntax for function definitions:**

- ✓ `let rec fn a1 a2 ... an := k`
- ✓ Here the 'fn' is a variable indicating an identifier being used as a function name.
- ✓ The names 'a1' to 'an' are variables indicating the identifiers used as parameters.
- ✓ The keyword 'rec' is required if 'fn' is to be a recursive function; otherwise it may be omitted.

**2. Write a short note on syntax for function types.**

- **The syntax for function types**  
 $x \rightarrow y$   
 $x_1 \rightarrow x_2 \rightarrow y$   
 $x_1 \rightarrow \dots \rightarrow x_n \rightarrow y$
- The 'x' and 'y' are variables indicating types.
- The type  $x \rightarrow y$  is the type of a function that gets an input of type 'x' and returns an output of type 'y' where as  $x_1 \rightarrow x_2 \rightarrow y$  is a type of a function that takes two inputs, the first input is of type  $\langle x_1 \rangle$  and the second input of type  $\langle x_2 \rangle$ , and returns an output of type  $\langle y \rangle$ .
- Likewise  $x_1 \rightarrow \dots \rightarrow x_n \rightarrow y$  has type 'x' as input of n arguments and 'y' type as output.

3. In the island there are different types of chameleons. Whenever two different color chameleons meet they both change their colors to the third color. Suppose two types of chameleons are equal in number.

Construct an algorithm that arranges meetings between these two types so that they change their color to the third type. In the end, all should display the same color.

```
let rec monoehromatize a b c:=
if a > 0 then
a, b, c:= a - 1, b - 1, c + 2
else
a:= 0 b:= 0 c:= a + b + c
return c
```

**HANDS ON PRACTICE**

1. Write the algorithmic function definition to find the minimum among 3 numbers.

PTA - 4

```
let min 3abc:=
if a < b then
if a < c then a else c
else
if b < c then b else c
```

2. Write the algorithmic recursive function definition to find the sum of 'n' natural numbers.

```
let rec sum num:
If(num!=0) then
return num+sum(num-1)
else
return num
```

☺ ☺ ☺ ☺ ☺

## PYTHON AND CSV FILES- An Overview

**CSV file:**

- A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter

**Two ways to read a CSV file:**

- The two ways to read a CSV file are using `csv.reader()` function and using `DictReader` class.

**Python File Modes :**

Mode	Description
'r'	Open a file for reading. (default)
'w'	Open a file for writing. Creates a new file if it does not exist or truncates the file if it exists.
'x'	Open a file for exclusive creation. If the file already exists, the operation fails.
'a'	Open for appending at the end of the file without truncating it. Creates a new file if it does not exist.
't'	Open in text mode. (default)
'b'	Open in binary mode.
'+'	Open a file for updating (reading and writing)

- The default mode of csv file in reading and writing is text mode
- Binary mode can be used when dealing with non-text files like image or exe files.

**Garbage collector:**

- Python has a garbage collector to clean up unreferenced objects

**Skip initial space:**

- "skip initial space" is used for removing whitespaces after the delimiter

**CSV library:**

- The CSV library contains objects and other code to read, write, and process data from and to CSV files.

**csv.reader , csv.writer, csv.DictReader , csv.DictWriter :**

- `csv.reader` and `csv.writer` work with list/tuple.
- `csv.DictReader` and `csv.DictWriter` work with dictionary .
- `csv.DictReader` and `csv.DictWriter` take additional argument `fieldnames` that are used as dictionary keys.
- The `csv.writer()` method returns a writer object which converts the user's data into delimited strings.
- `DictReader()` class of csv module creates an object which maps data to a dictionary.

**operator.itemgetter():**

- `operator.itemgetter()` can be used to sort by more than one column `operator.itemgetter()`

**itemgetter():**

- itemgetter() with multiple indices is used to sort by more than one column.

**writerow() Vs Writerows() :**

- The writerow() method writes one row at a time. Writerows() method is used to write all the data at once.

**csv.register\_dialect():**

- CSV file having custom delimiter is read with the help of csv.register\_dialect().

**close() method:**

- close() method will free up the resources that were tied with the file

**Line Terminator:**

- A Line Terminator is a string used to terminate lines produced by writer.

**Dialect :**

- A dialect is a class of csv module which helps to define parameters for reading and writing CSV.

**Ordered Dict:**

- An Ordered Dict is a dictionary subclass which saves the order in which its contents are added.

**PART - I - TEXTBOOK EVALUATION****PART - I****Choose the best answer (1 Marks)**

1. A CSV file is also known as a .... March 2020  
 a) Flat File                      b) 3D File                      c) String File                      d) Random File  
Ans : a) Flat File
2. The expansion of CRLF is May 2022  
 a) Control Return and Line Feed                      b) Carriage Return and Form Feed  
 c) Control Router and Line Feed                      d) Carriage Return and Line Feed  
Ans : d) Carriage Return and Line Feed
3. Which of the following module is provided by Python to do several operations on the CSV files?  
 a) py                      b) xls                      c) csv                      d) os Ans : c) csv
4. Which of the following mode is used when dealing with non-text files like image or exe files? Aug 2022 Mar 2023  
 a) Text mode                      b) Binary mode                      c) xls mode                      d) csv mode  
Ans : b) Binary mode
5. The command used to skip a row in a CSV file is  
 a) next()                      b) skip()                      c) omit()                      d) bounce()  
Ans : a) next()
6. Which of the following is a string used to terminate lines produced by writer() method of csv module?  
 a) Line Terminator                      b) Enter key                      c) Form feed                      d) Data Terminator  
Ans : a) Line Terminator



The default mode of csv file in reading and writing is text mode.

Mode	Description
'r'	Open a file for reading. (default)
't'	Open in text mode. (default)

#### 4. What is use of next() function?

The next() function returns the next item from the iterator. It can also be used to skip a row of the csv file.

#### 5. How will you sort more than one column from a csv file? Give an example statement.

- To sort by more than one column you can use itemgetter with multiple indices.

**operator.itemgetter (1,2)**

**Syntax:**

```
sortedlist = sorted( data, key=operator.itemgetter( Colnumber ),reverse=True)
```

**Example:**

```
data = csv.reader(open('c:\\PYPRG\\sample8.csv'))
next(data) #(to omit the header)
#using operator module for sorting multiple columns
sortedlist = sorted (data, key=operator.itemgetter(1,2))
```

**PART - III**

**Answer the following questions  
(3 Marks)**

#### 1. Write a note on open() function of python. What is the difference between the two methods? PTA - 1 Aug 2022

- Python has a built-in function open() to open a file.
- This function returns a file object also called a handle, as it is used to read or modify the file accordingly.

**Method 1:**

**Syntax:**

```
f = open("test.txt")
# perform file operations
f.close()
# since no mode is specified the default mode rt is used
```

**Method 2:**

**Syntax:**

- ```
with open("test.txt",'r') as f:
```
- The method1 is **not entirely safe**.
  - If an **exception** occurs when you are performing some operation with the file, the code exits without closing the file.
  - The best way to do this is using the **"with"** statement.
  - This ensures that the file is closed when the block inside **with** is exited. It is not necessary to explicitly call the close() method.
  - It is done internally.

#### 2. Write a Python program to modify an existing file. Aug 2022

**Coding:**

```
import csv
row = ['3: 'Meena'Bangalore']
with open('student.csv; 'r') as readfile:
    reader = csv.reader(readfile)
    lines = list(reader) # list()- to store each row of data as a list
    lines[3] = row
with open (student.csv, 'w') as writefile:
    # returns the writer object which converts the user data with delimiter
    writer = csv.writer(writefile)
    #writerows()method writes multiple rows to a csv file
    writer.writerows(lines)
readfile.close()
writefile.close()
```



Original File:

| Roll No | Name      | City      |
|---------|-----------|-----------|
| 1       | Harshini, | Chennai   |
| 2       | Adhith,   | Mumbai    |
| 3       | Dhuruv,   | Bengaluru |
| 4       | egiste,   | Tirchy    |
| 5       | Venkat    | Madurai   |

Modified File after the coding:

| Roll No | Name      | City      |
|---------|-----------|-----------|
| 1       | Harshini, | Chennai   |
| 2       | Adhith,   | Mumbai    |
| 3       | Meena     | Bangalore |
| 4       | egiste,   | Tirchy    |
| 5       | Venkat    | Madurai   |

3. Write a Python program to read a CSV file with default delimiter comma (.).

Coding :

```
#importing csv
import csv
#opening the csv file which is in different
location with read mode
with opent('c:\\pyprg\\sample1-csv', 'r') as F:
#other way to open the file is f= ('c:\\
pyprg\\ sample1.csv', 'r')
reader = csv.reader(F)
# printing each line of the Data row by
row
print(row)
F.close()
```

Output:

```
['SNO', 'NAME', 'CITY']
['12101', 'RAM', 'CHENNAI']
['12102', 'LAVANYA', 'TIRCHY']
['12103', 'LAKSHMAN', 'MADURAI']
```

4. What is the difference between the write mode and append mode.

PTA - 2 &amp; 5

| write mode                                                | append mode                                                                             |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|
| The write mode creates a new file.                        | append mode is used to add the data at the end of the file if the file already exists . |
| If the file is already existing write mode overwrites it. | Otherwise creates a new one.                                                            |

5. What is the difference between reader() method and DictReader() class? Mar 2020 & 2023

| reader() method                                              | DictReader() class                                                                                     |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| csv. reader and csv.writer work with list/tuple              | csv.DictReader and csv.DictWriter work with dictionary.                                                |
| csv. reader and csv.writer do not take additional argument . | csv.DictReader and csv.DictWriter take additional argument fieldnames that are used as dictionary keys |

## PART - IV

Answer the following questions (5 Marks)

1. Differentiate Excel file and CSV file.

PTA - 2 &amp; 6 May 2022

| 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. |

| Excel                                                                                                                                       | CSV                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 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, Open Office, 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                      |

## 2. Tabulate the different mode with its meaning.

| Mode | Description                                                                                               |
|------|-----------------------------------------------------------------------------------------------------------|
| 'r'  | open a file for reading (default)                                                                         |
| 'w'  | Open a file for writing. Creates a new file if it does not exist or truncates the file if it exists.      |
| 'x'  | Open a file for exclusive creation. If the file already exists, the operation fails.                      |
| 'a'  | Open for appending at the end of the file without truncating it. Creates a new file if it does not exist. |
| 't'  | Open in text mode. default                                                                                |
| 'b'  | Open in binary mode.                                                                                      |
| '+'  | Open a file for updating (reading and Writing)                                                            |

## 3. Write the different methods to read a File in Python.

Aug 2022

There are two ways to read a CSV file.

1. Use the csv module's reader function
2. Use the DictReader class.

### csv module's reader function:

- We can read the contents of CSV file with the help of csv.reader() method.
- The reader function is designed to take each line of the file and make a list of all columns.
- Using this method one can read data from csv files of different formats like quotes (" "), pipe (|) and comma (,).

### Syntax for csv.reader():

**csv.reader( fileobject,delimiter,fmtparams)**

where

- ✓ file object: passes the path and the mode of the file
- ✓ delimiter: an optional parameter containing the standard dialects like , | etc can be omitted.
- ✓ **Fmtparams**: optional parameter which help to override the default values of the dialects like skipinitialspace,quoting etc. can be omitted.

**Program:**

```
#importing csv
import csv
#opening the csv file which is in different
location with read mode
with open('c:\\pyprg\\sample1-csv', 'r') as F:
#other way to open the file is f= ('c:\\
pyprg\\ sample1.csv', 'r')
reader = csv.reader(F)
# printing each line of the Data row by row
print(row)
F.close()
```

**Output:**

```
['SNO', 'NAME', 'CITY']
['12101', 'RAM', 'CHENNAI']
['12102', 'LAVANYA', 'TIRCHY']
['12103', 'LAKSHMAN', 'MADURAI']
```

**Reading CSV File into A Dictionary:**

- To read a CSV file into a dictionary can be done by using DictReader class of csv module which works similar to the reader() class but creates an object which maps data to a dictionary.
- The keys are given by the fieldnames as parameter.
- DictReader works by reading the first line of the CSV and using each comma separated value in this line as a dictionary key.
- The columns in each subsequent row then behave like dictionary values and can be accessed with the appropriate key (i.e. fieldname).

**Program:**

```
import csv
filename = 'c:\\pyprg\\ sample8.csv'
inputfile = csv.DictReader( open(filename, 'r'))
for row in inputfile:
print(dict(row) ) #dict() to print data
```

**Output:**

```
{'ItemName': 'Keyboard', 'Quantity': '48'}
{'ItemName': 'Monitor', 'Quantity': '52'}
{'ItemName': 'Mouse', 'Quantity': '20'}
```

4. Write a Python program to write a CSV File with custom quotes.

**Coding:**

```
import csv
csvData = [['SNO','Items'], ['1','Pen'],
['2','Book'], ['3','Pencil']]
csv.register_dialect('myDialect', delimiter
= '|', quotechar = '"', quoting = csv.
QUOTE_ALL)
with open('c:\\pyprg\\ch13\\quote.
csv', 'w') as csvFile:
writer = csv.writer(csvFile,
dialect='myDialect')
writer.writerows(csvData)
print("writing completed")
csvFile.close()
```

When you open the "quote.csv" file in notepad, we get following output:

| Sl.No | "Items"  |
|-------|----------|
| 1     | "Pen"    |
| 2     | "Book"   |
| 3     | "Pencil" |

5. Write the rules to be followed to format the data in a CSV file. PTA - 5

1. Each record (row of data) is to be located on a separate line, delimited by a line break by pressing enter key.

**Example:**

xxx.yyy↵ (↵ denotes enter Key to be pressed)

2. The last record in the file may not have an ending line break.

**Example:**

```
ppp,qqq↵
yyy,xxx
```

3. There may be an optional header line appearing as the first line of the file with the same format as normal record lines. The header will contain names corresponding to the fields in the file and should contain the same number of fields as the records in the rest of the file.

**Example:**

field\_name1,field\_name2,field\_name3↓  
 zzz,yyy,xxx CRLF(Carriage Return and Line Feed)

4. Within the header and each record, there may be one or more fields, separated by commas. Spaces are considered part of a field and should not be ignored. The last field in the record must not be followed by a comma.

**Example:**

Red, Blue

5. Each field may or may not be enclosed in double quotes. If fields are not enclosed with double quotes, then double quotes may not appear inside the fields

**Example.**

"Red","Blue","Green"↓ #Field data with"  
 Black,White,Yellow #Field data without double quotes

6. Fields containing line breaks (CRLF), double quotes, and commas should be enclosed in double-quotes.

**Example:**

Red, Blue, Green

7. If double-quotes are used to enclose fields, then a double-quote appearing inside a field must be preceded with another double quote.

**Example:**

"Red, " "Blue", "Green"

## PART II - ADDITIONAL QUESTIONS

### I. Choose the best answer (1 Marks)

1. Which of the following gives the python programmer the ability to parse CSV files?  
 a) sys module                      b) CSV module                      c) parse module                      d) CSV flat file  
**Ans : b) CSV module**
- 
2. Abbreviation of CSV  
 a) Condition systematic values                      b) Colomn separated values  
 c) Comma solution values                      d) Comma separated values  
**Ans : d) Comma separated values**
- 
3. A \_\_\_\_\_ is a human readable text file where each line has a number of fields, separated by commas or some other delimiter.  
 a) CSV file                      b) Colomn separated values  
 c) CSV sheet                      d) Condition systematic values **Ans : a) CSV file**
- 
4. Which of the following can protect if the data itself contains commas in CSV file?  
 a) ''                      b) ,,                      c) ""                      d) '                      **Ans : c) ""**
- 
5. In CSV file, each record is to be located on a separate line, delimited by a line break by pressing  
 a) Enter key                      b) ESV key                      c) Tab key                      d) Shift key  
**Ans : a) Enter key**

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- 
6. There are \_\_\_\_\_ ways to read a CSV file.  
a) 2                              b) 3                              c) 4                              d) Only one                      **Ans : a) 2**
- 
7. \_\_\_\_\_ built-in function is used to open a file in Python .  
a) readfn ()                      b) open ()                      c) reader ()                      d) openfile ()  
**Ans : b) open ()**
- 
8. \_\_\_\_\_ mode can be used when CSV files dealing with non-text files.  
a) Write mode                      b) Binary mode                      c) Octal mode                      d) Write mode  
**Ans : b) Binary mode**
- 
9. The default file open mode is \_\_\_\_\_.  
a) rt                              b) x                              c) a                              d) rw                              **Ans : a) rt**
- 
10. The CSV file contents can be read with the help of the method  
a) read ()                              b) open ()                              c) with open ()                      d) reader ()  
**Ans : d) reader ()**
- 
11. \_\_\_\_\_ function is designed to take each line of the file and make a list of all columns?  
a) read ()                              b) reader ()                              c) row ()                              d) list ()                              **Ans : b) reader ()**
- 
12. \_\_\_\_\_ describes the format of the CSV file that is to be read.  
a) line space                              b) dialect                              c) whitespace                              d) delimiter  
**Ans : b) dialect**
- 
13. \_\_\_\_\_ allows to create, store and re-use various formatting parameters for CSV file in reading and writing.  
a) class                              b) dialect                              c) write()                              d) read()                              **Ans : b) dialect**
- 
14. \_\_\_\_\_ is used to add elements in CSV .  
a) update ()                              b) write ()                              c) append ()                              d) addition ()  
**Ans : c) append ()**
- 
15. In CSV file, \_\_\_\_\_ function is used to sort more than one column .  
a) sorter ()                              b) multiplesort ()                              c) itemsort ()                              d) morecolumns ()  
**Ans : a) sorter ()**
- 
16. \_\_\_\_\_ method returns a writer object which converts the user's data into delimited strings on the given file-like object.  
a) csv.writer()                              b) csv.write user ()                              c) csv.writes ()                              d) csv\_writer ()  
**Ans : a) csv.writer()**
- 
17. \_\_\_\_\_ method writes a row of data into the specified CSV file.  
a) rows ()                              b) writerow ()                              c) row\_data ()                              d) row\_write ()  
**Ans : b) writerow ()**
- 
18. \_\_\_\_\_ function is used to print the data in dictionary format without order.  
a) diet ()                              b) dictionarys ()                              c) read\_dict ()                              d) print\_dict ()  
**Ans : a) diet ()**
-



- A dialect describes the format of the csv file that is to be r 4, In dialects the parameter “skipinitialspace” is used for removing whitespaces after the delimiter.

---

**6. Define: dialect**

- A dialect is a class of csv module which helps to define parameters for reading and writing CSV.
- It allows to create, store, and re-use various formatting parameters for data.

---

**7. Compare: sort() and sorted ().**

- The sorted () method sorts the elements of a given item in a specific order - ascending or descending.
- sort () method performs the same way as sorted ().
- Only difference, sort () method doesn't return any value and changes the original list itself.

---

**8. Explain How to read CSV file into a dictionary?**

- To read a CSV file into a dictionary can be done by using DictReader class of csv module which works similar to the reader () class but creates an object which maps data to a dictionary.
- The keys are given by the fieldnames as parameter.

---

**9. Define: Ordered Dict?**

- DictReader () gives OrderedDict by default in its output.
- An OrderedDict is a dictionary subclass which saves the order in which its contents are added.
- To remove the OrderedDict use dict ().

---

**10. Give the difference in between writerow() and writerows() method.**

| writerow()                                         | writerows()                                                                |
|----------------------------------------------------|----------------------------------------------------------------------------|
| The writerow() method writes one row at a time.    | <b>writerows()</b> method writes all the data at once to the new CSV file. |
| The writerow() method writes one dimensional data. | The writerows() method writes multi dimensional data.                      |

---

**11. Define:Modification**

- Making some changes in the data of the existing file or adding more data is called modification.

---

**12. Write a note on Line Terminator.**

- A Line Terminator is a string used to terminate lines produced by writer.
- The default value is \r or \n. We can write csv file with a line terminator in Python by registering new dialects using csv. register\_dialect () class of csv module.

---

**13. Explain How to write Dictionary into CSV file with custom dialects?**

**Coding :**

```
import csv
csv.registeredialect('myDialect', delimiter = 'I; quoting=csv.QUOTE_ALL)
```

```
with open('c:\\pyprg\\ch13\\vgrade.
csv, 'w') as csvfile
fieldnames = ['Name', 'Grade']
writer = csv.DictWriter(csvfile,
fieldnames = fieldnames. dialect
="myDialect")
writer.writeheader()
writer.writerows([{'Grade': 'B', 'Name':
Anu'},
{'Gra dee': 'nA,' 'Name': 'Beena,'}
{'Grade': 'C: 'Name': 'Tarun'}])
print("writing completed")
```

| "Name"  | "Grade" |
|---------|---------|
| "Anu"   | "B"     |
| "Beena" | "A"     |
| "Tarun" | "C"     |

#### 14. How will you create CSV in text editor?

- To create a CSV file in Notepad, First open a new file using  
**File → New or ctrl +N**
- Then enter the data separating each value with a comma and each row with a new line.
- Example: consider the following details  
Topic1, Topic2, Topic3  
one, two, three  
Example1, Example2, Example3
- Save this content in a file with the extension.csv.

#### 15. Explain how to create a new normal CSV file to store data

PTA - 4

- The `csv.writer()` method returns a writer object which converts the user's data into delimited strings on the given file-like object.
- The `writerow()` method writes a row of data into the specified file.
- The syntax for `csv.writer()` is `csv.writer(fileobject, delimiter, fmtparams)` where ,

|                     |                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Fileobject :</b> | passes the path and the mode of the file.                                                                                        |
| <b>Delimiter :</b>  | an optional parameter containing the standard dilects like ,   etc can be omitted.                                               |
| <b>Fmtparams :</b>  | optional parameter which help to override the default values of the dialects like skipinitialspace, quoting etc. can be omitted. |

#### Coding:

```
import csv
csvData = [['Student', 'Age'], ['Dhanush',
'17'], ['Kalyani', '18'], ['Ram', '15']]
with open('c:\\pyprg\\ch13\\Pupil.csv',
'w') as CF:
writer = csv.writer(CF)
# CF is the file object
writer.writerows(csvData)
# csvData is the List name
CF.close()
```

#### 16. Explain how to write CSV Files With Quotes

- We can write the csv file with quotes, by registering new dialects using **csv.register\_dialect()** class of csv module.

#### Coding:

```
import csv
info = [['SNO', 'Person', 'DOB'],
['1', 'Madhu', '18/12/2001'],
['2', 'Sowmya', '19/2/1998'],
['3', 'Sangeetha', '20/3/1999'],
['4', 'Eshwar', '21/4/2000'],
['5', 'Anand', '22/5/2001']]
csv.register_
dialect('myDialect', quoting=csv.QUOTE_
ALL)
with open('c:\\pyprg\\ch13\\person.
csv', 'w') as f:
```



```
writer = csv.writer(f, dialect='myDialect')
for row in info:
writer.writerow(row)
f.close()
```

**When you open "person.csv" file, we get following output :**

```
"SNO","Person","DOB"
"1","Madhu","18/12/2001"
"2","Sowmya","19/2/1998"
"3","Sangeetha","20/3/1999"
"4","Eshwar","21/4/2000"
"5","Anand","22/5/2001"
```

### III. Answer the following questions (5 Marks)

1. Explain how to read a specific column in a CSV file.

**Coding for printing the selected column:**

```
import csv
#opening the csv file which is in different
location with read mode
f=open("c:\\pyprg\\sample5.csv",'r')
#reading the File with the help of csv.
reader()
readFile=csv.reader(f)
#printing the selected column
for col in readFile:
print col[0],col[3]
f.close ()
```

**Sample5.csv File in Excel**

|   | A         | B       | C        | D      |
|---|-----------|---------|----------|--------|
| 1 | item Name | Cost-Rs | Quantity | Profit |
| 2 | Keyboard  | 480     | 12       | 1152   |
| 3 | Monitor   | 5200    | 10       | 10400  |
| 4 | Mouse     | 200     | 50       | 2000   |

**OUTPUT**

| item Name | Profit |
|-----------|--------|
| Keyboard  | 1152   |
| Monitor   | 10400  |
| Mouse     | 2000   |

2. Explain how to read the CSV file and store it in a list.

**Coding for reading the CSV file and store it in a list:**

```
import csv
# other way of declaring the filename
inFile= 'c:\\pyprg\\sample.csv'
F=open (inFile,' r')
reader = csv.reader(F)
# declaring array
arrayValue = [ ]
# displaying the content of the list for row
in reader:
arrayValue.append(row)
print(row)
F.close ()
```

**OUTPUT :**

```
['Topic1', 'Topic2', 'Topic3']
[' one', 'two', 'three']
['Example1', 'Example2', 'Example3']
```

3. Explain how to read the CSV file and sort the data in a particular column. .

**Coding for reading the CSV file and sort the data in a particular column:**

```
# sort a selected column given by user
leaving the header column
import csv
# other way of declaring the filename
inFile= 'c:\\pyprg\\sample6.csv'
# opening the csv file which is in the same
location of this
python file
F=open(inFile:r')
# reading the File with the help of csv.
readerO
reader = csv.reader(F)
# skipping the first row(heading)
next(reader)
# declaring a list
arrayValue = [ ]
a = int(input ("Enter the column number 1
to 3:-"))
# sorting a particular column-cost
```

```

for row in reader:
arrayValue.append(row[ a])
arrayValue.sort ( )
for row in arrayValue:
print (row)
Eclose ( )

```

**OUTPUT:**

```

Enter the column number 1 to 3:- 2
50
12
10

```

**4. Explain how to read CSV file with a line Terminator.****Coding:**

```

import csv
Data = [['Fruit', 'Quantity'], [Apple, '5'],
[Banana, '7'] ['Mango: '8']]
csv.register_dialect('myfrialect; delimiter
= '|', lineterminator = '\n')
with open('c:\\pyprg\\ch3\\line.csv:
'w') as f:
writer = csv.writer(f, dialect='myDialect')
writer.writerows(Data)
f.close ( )

```

**Output:**

| Fruit  | Quantity |
|--------|----------|
| Apple  | 5        |
| Banana | 7        |
| Mango  | 8        |

**5. Write a program to set data at runtime and writing it in a CSV file.****Coding:**

```

import csv
with open ('c\\pyprg\\ch13\\
vdynamicfile.csv', 'w') as f:
w = csv.writer(f)
ans= 'y'
while (ans=='y'):
name=input("Name?:")
date=input("Date of birth:")
Place=input ("Place:")
W.writerow([name, date, place])
ans=input("Do you want to enter more
y/n?:")
F=open('c:\\pyprg\\ch13\\dynamicfile.
csv',r')
reader=csv.reader(F)
for row in reader:
print (row)
F.close()

```

**OUTPUT :**

```

Name?: Nivethitha
Date of birth: 12/12/2001
Place: Chennai
Do you want to enter more y/n?: y
Name?: Leena
Date of birth: 15/10/2001
Place: Nagercoil
Do you want to enter more y/n?: y
Name?: Padma
Date of birth: 18/08/2001
Place: Kumbakonam
Do you want to enter more y/n?: n
['Nivethitha', '12/12/2001', 'Chennai']
[]
['Leena', '15/10/2001', 'Nagercoil']
[]
['Padma', '18/08/2001', 'Kumbakonam']

```

## GOVT. QUESTION PAPER – MARCH 2023

Time : 3.00 Hours

Maximum Marks : 70

- Instructions:** (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.  
 (2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

## PART - I

- Note :** (i) Answer **all** the questions. 15×1=15  
 (ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. \_\_\_\_\_ members are accessible from outside the class.  
 a) Secured members    **b) Public members**    c) Private members    d) Protected members
2. Which of the following is not a keyword in Python?  
 a) continue                      b) break                      **c) operator**                      d) while
3. The small sections of code that are used to perform a particular task is called:  
 a) Pseudo code                      **b) Subroutines**                      c) Modules                      d) Files
4. The number of important control structures in Python:  
 a) 5                      **b) 3**                      c) 6                      d) 4
5. Class members are accessed through \_\_\_\_\_ operator.  
 a) #                      b) &                      c) %                      **d) .**
6. The database Model which represents the Parent-Child relationship:  
**a) Hierarchical**                      b) Relational                      c) Object                      d) Network
7. The operator which is used for concatenation?  
 a) \*                      **b) +**                      c) =                      d) &
8. Importing C++ program in a Python program is called \_\_\_\_\_  
 a) Interconnecting                      **b) Wrapping**                      c) Parsing                      d) Downloading
9. \_\_\_\_\_ command is used to remove a table from the database.  
 a) DELETE ALL                      **b) DROP TABLE**                      c) ALTER TABLE                      d) DELETE
10. The function that returns the largest value of the selected column is:  
 a) HIGH ( )                      **b) MAX ( )**                      c) MAXIMUM ( )                      d) LARGE ( )
11. The datatype whose representation is known are called:  
**a) Concrete datatype**    b) Built-in datatype                      c) Abstract datatype                      d) Derived datatype
12. A Function which calls itself, is called as:  
 a) Lambda                      b) Built-in                      c) Return statement                      **d) Recursion**
13. The mode which is used when dealing with non-text files like image or exe files:  
 a) xls mode                      b) Text mode                      c) csv mode                      **d) Binary mode**
14. In dynamic programming, the technique of storing the previously calculated values is called:  
**a) Memoization**                      b) Saving value property  
 c) Mapping                      d) Storing value property

15. Let set A = {3, 6, 9}, set B = {1, 3, 9}.

The result of the following snippet Print (set A | set B)

- a) {1}                      b) {3, 6, 9, 1, 3, 9}                      c) {1, 3, 6, 9}                      d) {3, 9}

#### PART - II

**Note :** Answer **any six** questions. Q.No. **24** is **compulsory**.

6×2=12

16. What is a Tuple? Give an example.

**Chapter-2**

17. What is a scope?

**Chapter-3**

18. How will you delete a string in Python?

**Chapter-8**

19. Write note on range ( ) in loop.

**Chapter-6**

20. What is class?

**Chapter-10**

21. What is Data Manipulation Language?

**Chapter-12**

22. Mention the default modes of the File.

**Chapter-13**

23. List the general types of data visualization.

**Chapter-16**

24. Squares = [x\*\*2 for x in range (1, 11)]

print (squares)

**Chapter-9**

What will be output of the following Python code?

Squares = [x\*\*2 for x in range (1, 11)]

print (squares)

#### PART - III

**Note :** Answer **any six** questions. Question No. **33** is **compulsory**.

6×3=18

25. Mention the characteristics of Interface.

**Chapter-1**

26. What do you understand by Dynamic Programming?

**Chapter-4**

27. Explain Ternary operator with an example.

**Chapter-5**

28. Write the syntax of while loop.

**Chapter-6**

29. Differentiate - ceil ( ) and floor ( ) function.

**Chapter-7**

30. What is the difference between csv reader ( ) method and DictReader ( ) class?

**Chapter-13**

31. Differentiate fetchone ( ) and fetchmany ( ).

**Chapter-15**

32. Write a Python program to display the given pattern.

COMPUTER

COMPUTE

COMPUT

COMPU

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C

**Chapter-8**

33. Write about the steps of Python program executing C++ program using control statement.

**Chapter-14**

## Part - IV

Answer all the questions.

[5 × 5 = 25]

34. a) What is a List? Why List, can be called as pairs? Explain with suitable example. **Chapter-2**  
(OR)  
b) Discuss about Linear Search Algorithm. **Chapter-4**
35. a) Discuss in details about Token in Python. **Chapter-5**  
(OR)  
b) Explain the following built-in function. **Chapter-7**  
(i) id ()  
(ii) chr ()  
(iii) round ()  
(iv) type ()  
(v) pow ()
36. a) What is Nested Tuple? Explain with an example. **Chapter-9**  
(OR)  
b) Explain the different types of relationship mapping. **Chapter-11**
37. a) Write the syntax for getopt () and explain its arguments and return values. **Chapter-14**  
(OR)  
b) Differentiate DBMS and RDBMS. **Chapter-11**
38. a) Explain about differences between Histogram and Bar Graph. **Chapter-16**  
(OR)  
b) Explain 'continue' statement with an example. **Chapter-6**

\*\*\*\*\*