**UNIT – 5**

**FILES, MODULES AND PACKAGES**

**PART A**

1. **Define File.**

A file refers to a location with filename that stores information. The storage area is non-volatile memory like hard-disk. A file stores related data information. A file can be a sequence of bits, bytes, lines or records depending of the application/software used to create it.

1. **What is a text file?**

A text file is a file that contains printable characters and whitespace, organized in to lines separated by newline character.

1. **List the File Opening Modes**

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| --- | --- |
| Mode | Description |
| r | Opens a file for reading only. It is the default mode. File pointer is placed at beginning of the file |
| w | Opens a file for writing only. If the file exists, it overwrites the file. If the file does not exist, it creates a new file. File pointer is placed at beginning of the file. |
| a | Opens a file for appending. If the file exists, file pointer is at end of the file. If the file does not exist, it creates new file and file pointer is placed at beginning of the file. |
| r+ | Opens a file for reading and writing. File pointer is shifted to the beginning of the file. |
| w+ | Opens a file for writing and reading. If the file exists, it overwrites the file. If the file does not exist, it creates a new file. File pointer is placed at beginning of the file. |
| a+ | Opens a file for both appending and reading If the file exists, file pointer is placed at end of the file. If the file does not exist, it creates a new file and file pointer is placed at beginning of the file. |
| rb | Opens a file for read only purpose in binary format. File pointer placed at beginning of the file |
| wb | Opens a file for write purpose in binary format. If the file already exists, it overwrites the file. If the file does not exist, it creates a new file. |

1. **What are the two arguments taken by open() method.**

The open() method takes two arguments:

1. name of the file
2. mode of operation

Example: file\_object = open(“inputfile.txt”, “r”)

1. **What is file object?**

A file object allows us to use, access and manipulate all the user accessible files. It maintains the state about the file it has opened.

1. **List the different ways to read a file**

The text file can be read in three different ways as listed below.

* Using read() method
* Using readline() method
* Using readlines() method

1. **What is difference between append and write mode**

In “a”-append mode, the write pointer is set to end of file. In append mode the file can never be read. The contents can only be written at the end of the file.

In “w”-write mode, the write pointer is set to the beginning of the file.

1. **What are the attributes of file object**

|  |  |
| --- | --- |
| **Attribute** | **Description** |
| file.closed | Returns True if file has been closed. Else return False |
| file.mode | Returns the mode in which file was opened |
| file.name | Returns name of the file |
| file.softspace | Returns False if space explicitly required with print, True otherwise |

1. **List the methods in file object.**

|  |  |
| --- | --- |
| Method | Description |
| close() | Close an opened file |
| read(n) | Reads at most ‘n’ characters from file |
| readline(n = -1) | Read and return one line(at most n bytes) from file |
| readlines(n = -1) | Read and return a list of lines(atmost n bytes) from file |
| seek(offset, whence ) | Changes the file pointer position to offset bytes, in reference to whence |
| tell() | Returns the current file pointer position |
| write(s) | Write the string ‘s’ to the file |
| writelines(lines) | Writes a list of lines to the file |
| next() | Return the next line from file each time it is being called |

1. **Differentiate Errors and Exception**

Errors are caused by the mistakes in the program. There are three types of errors: syntax errors, Runtime errors and Logical errors.

Errors detected during execution / runtime are called as exceptions. They are syntactically correct statements but they might cause errors during execution.

1. **Define Modules**

In python, a module is a .py file which contains python statements, functions or methods. To use the functions of the module, we need to import them.

Syntax: import <module-name>

Example: import math

1. **Define packages**

Packages are namespaces that contain multiple modules themselves. They are simply directories.

Syntax: from <package-name> import <module-name>

Example: from math import sqrt

1. **Define Pickling**

Pickling saves an object to a file for later retrieval. The pickle module helps to translate almost any type of object to a string suitable for storage in a database and then translate the strings back into objects.

1. **What are the two methods used in pickling?**

Two methods used in pickling are

(i)pickle.dump() – to store a data structure into a file (ie., to write)

(ii)pickle.load() – to load data structures that are dumped (ie., to read)

Example:

>>> file\_object = open("inputfile.pickle","wb")

>>> phone\_book = {'ajees':8042874102, 'abi':6102487951,'ajay':7021488551}

>>> pickle.dump(phone\_book, file\_object)

>>> file\_object.close()

>>> file\_object = open("inputfile.pickle","rb")

>>> contents\_of\_file = pickle.load(file\_object)

>>> print(contents\_of\_file)

{'ajees': 8042874102, 'abi': 6102487951, 'ajay': 7021488551}

1. **What is the function of raise statement. What are its two arguments?**

The raise statement is used to raise an exception when the program detects an error. It takes two arguments: the exception type and specific information about the error

Example:

>>> try:

age = int(input("Enter your age:"))

if age < 18:

raise ValueError( "Not Eligible to vote")

except ValueError as error:

print(error)

Output:

Enter your age:17

Not Eligible to vote

1. **Give a mechanism to handle exceptions**

The try and except statements are used to handle the runtime errors.

Syntax:

try:

# lines of code that might encounter runtime error

except:

# lines of code that will be executed when runtime error occurs

|  |  |
| --- | --- |
| Example:  #ZeroDivisionError exception  >>> try:  number = int(input("Enter a number:"))  print (number / 0)  except ZeroDivisionError:  print("Integer division by zero error") | Output:  Enter a number:5  Integer division by zero error |

1. **How do you delete a file in python?**

The remove() method is used to delete a file by supplying the name of the file to be deleted as argument. This remove() is available in the OS - module

Syntax: os.remove(filename)

1. **How do you use command line arguments to give input to the program?**

Python ‘sys’- module provides access to any command-line arguments via sys.argv. sys.argv is the list of command-line arguments, starts with the index ‘0’-zero.

len(sys.argv) – will return the number of command-line arguments

sys.argv[0] – contain the python script which was executed

sys.argv[1] – contains the supplied command-line argument

1. **Write a python script to display the current date and time.**

>>> import datetime

>>> now = datetime.datetime.now()

>>> print("Current date and time = ", now)

Current date and time = 2018-11-26 16:26:34.716326

1. **Write a note on modular design?**

Modular design allows large programs to be broken down into manageable size parts, in which each part (module) provides a clear specified capability. It allows modules to be individually developed and tested, and eventually integrated as a part of a complete system. Finally, modular design facilitates program modification since the code responsible for a given aspect of the software is contained within specific modules, and not distributed throughout the program

**PART – B**

1. Discuss with suitable examples

(i)Opening a file

(ii)Writing to a file

(iii)Close a file

1. a) Write a python program to find the longest word in a file.

b) Write a python program to dump objects into a file using pickle.

1. Describe in detail about exceptions and exception handling.
2. a)Explain with an example for exception with arguments in python

b) Describe in detail about user defined exception with an example program

1. Write a python program to find the most frequently occurring words of a file.
2. Write a python program to count number of characters, words and lines in a text file.
3. Explain in detail about Modules and Packages. Create a ‘calculator’ package with required modules and import in a python script.
4. a) Write a python program to perform file copy.

b) Write a python program to rename a file.