Name: - Saurabh Suman Section: -C

Course: - MCA Student id: - 20711067

LAB ASSIGNMENT\_3:

Programs on Python functions and file handling

Question – 1:

Code: -

import numpy as nm

from numpy.core.fromnumeric import sort

def sorting(array):

return sort(array)

arr = nm.array([3, 2, 0, 1, 6, 5, 9, 7, 8])

print("Original array: ")

print(arr)

sorted\_Array = sorting(arr)

print("Sorted array: ")

print(sorted\_Array)

# --------OUTPUT--------#

# Original array:

# [3 2 0 1 6 5 9 7 8]

# Sorted array:

# [0 1 2 3 5 6 7 8 9]

# ----------------------#

Question -2:

Code: -

import numpy as np

def addmatrix(matrix1, matrix2):

matrix = np.add(matrix1, matrix2)

print("Sum of the two matrix: ")

print()

print(matrix)

arr1 = np.array([[12, 15, 123],

[10, 1, 85]])

arr2 = np.array([[34, 31, 51],

[1, 3, 4]])

addmatrix(arr1, arr2)

# ----------OUTPUT---------#

# Sum of the two matrix:

# [[ 46 46 174]

# [ 11 4 89]]

# -------------------------#

Question – 3:

Code:

# Creating the file and opening in the write mode.

file1 = open("D:/python/ClassRoomCode/Lab\_Assignment\_3/FirstFile.txt", "w")

txt = "My name is Saurabh Suman. "

file1.write(txt)

# Closing the file

file1.close()

# opening the file in the reading mode.

file1 = open("D:/python/ClassRoomCode/Lab\_Assignment\_3/FirstFile.txt", "r")

content = file1.read()

print(content)

file1.close()

# opening thee file in the append mode.

file1 = open("D:/python/ClassRoomCode/Lab\_Assignment\_3/FirstFile.txt", "a")

txt2 = "\nCurrently I am studying in the GEHU.\nI am perusing MCA."

file1.write(txt2)

file1.close()

# reading the whole file using loop.

file1 = open("D:/python/ClassRoomCode/Lab\_Assignment\_3/FirstFile.txt", "r")

print("----------------------------------------------------")

for line in file1:

print(line)

file1.close()

# counting the no of line in the file.

file1 = open("D:/python/ClassRoomCode/Lab\_Assignment\_3/FirstFile.txt", "r")

linecount = 0

word = []

wordcount = 0

char = []

charCount = 0

for line in file1:

linecount += 1

word = line.split(" ")

wordcount += len(word)

for i in word:

charCount += len(i)

print("-----------------------------------------------------")

print("Number of line in a file: ")

print(linecount)

print("Number of word in a file: ")

print(wordcount)

print("Number of character in a file: ")

print(charCount)

# -----------------OUTPUT---------------------------

# My name is Saurabh Suman.

# ----------------------------------------------------

# My name is Saurabh Suman.

# Currently I am studying in the GEHU.

# I am perusing MCA.

# -----------------------------------------------------

# Number of line in a file:

# 3

# Number of word in a file:

# 17

# Number of character in a file:

# 68

Question – 4:

Code: -

import numpy as np

arr = np.array([1, 2, 3, 4, 5, 56, 7, 8, 9, 17, 12])

print("Original array: ")

print(arr)

# Adding new element in the array using append function

arr2 = np.append(arr, [43, 543, 654, 232, 895])

print("Array after appending new element: ")

print(arr2)

# Calculating the sum of the array:

sumofarray = np.sum(arr2)

print("Sum of a new array: ")

print(sumofarray)

# Calculating the length of a new array;

length = np.shape(arr2)

print("Length of a array: ")

print(length)

# Calculating the mean of a array:

print("Mean of the array")

mean = np.mean(arr2)

print(mean)

# Calculating the median of a array:

print("Median of the array: ")

median = np.median(arr2)

print(median)

# finding the max of the array:

print("Max of the array: ")

maximum = np.max(arr2)

print(maximum)

# finding the min of the array:

print("Min of the array: ")

minimum = np.min(arr2)

print(minimum)

# -----------OUTPUT--------------------------

# Original array:

# [ 1 2 3 4 5 56 7 8 9 17 12]

# Array after appending new element:

# [ 1 2 3 4 5 56 7 8 9 17 12 43 543 654 232 895]

# Sum of a new array:

# 2491

# Length of a array:

# (16,)

# Mean of the array

# 155.6875

# Median of the array:

# 10.5

# Max of the array:

# 895

# Min of the array:

# 1

LAB\_ASSIGNMENT\_4:

Programs on NumPy:

Question 1: - Write a program to perform basic arithmetic operations in a NumPy array.

Code: -

import numpy as np

arr1 = np.array([7, 4, 1, 5, 2, 9, 8, 12])

arr2 = np.array([1, 4, 5, 6, 7, 8, 9, 10])

print("Sum of the data of arr1 using numpy: ")

sumofarray = np.sum(arr1)

print(sumofarray)

print("Sum of two array using numpy: ")

addition = np.add(arr1, arr2)

print(addition)

print("subtraction of the two array: ")

subtraction = np.subtract(arr1, arr2)

print(subtraction)

print("Multiplication of the two array: ")

multiplication = np.multiply(arr1, arr2)

print(multiplication)

print("Division of the two matrix: ")

division = np.divide(arr1, arr2)

print(division)

# ----------------- OUTPUT -------------------

# Sum of the data of arr1 using numpy:

# 48

# Sum of two array using numpy:

# [ 8 8 6 11 9 17 17 22]

# subtraction of the two array:

# [ 6 0 -4 -1 -5 1 -1 2]

# Multiplication of the two array:

# [ 7 16 5 30 14 72 72 120]

# Division of the two matrix:

# [7. 1. 0.2 0.83333333 0.28571429 1.125

# 0.88888889 1.2 ]

Question -2: Write a program to illustrate the indexing and slicing operations in NumPy arrays.

Code: -

import numpy as np

arr1 = np.array([1, 3, 5, 6, 15, 9, 24, 64, 653, 23])

print("Slicing of the numpy array: ")

print(arr1[4:7])

print("Indexing of the numpy arrays")

print(arr1[2])

# --------------OUTPUT------------------

# Slicing of the numpy array:

# [15 9 24]

# Indexing of the numpy arrays

# 5

Question – 3: Write a program to implement a single random walk with 1000 steps using the built-in random module

Code: -

import random

import numpy as np

import matplotlib.pyplot as plt

prob = [0.05, 0.95]

start = 2

positions = [start]

rr = np.random.random(1000)

downp = rr < prob[0]

upp = rr > prob[1]

for idownp, iupp in zip(downp, upp):

down = idownp and positions[-1] > 1

up = iupp and positions[-1] < 4

positions.append(positions[-1] - down + up)

plt.plot(positions)

plt.show()