***LAB ASSIGNMENT 2***

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 1:**  WRITE A PROGRAM TO PERFORM BASIC ARITHMETIC OPERATIONS IN A NUMPY ARRAY.

**SOURCE CODE:**

import numpy as np

arr1 = np.array([27, 50, 1, 65, 2])

arr2 = np.array([11, 41, 5, 6, 37])

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:**

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

#Sum of the data of arr1 using numpy:

#145

#Sum of two array using numpy:

#[38 91 6 71 39]

#subtraction of the two array:

#[ 16 9 -4 59 -35]

#Multiplication of the two array:

#[ 297 2050 5 390 74]

#Division of the two matrix:

#[ 2.45454545 1.2195122 0.2 10.83333333 0.05405405]

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 2:**  WRITE A PROGRAM TO ILLUSTRATE THE INDEXING AND SLICING OPERATIONS IN NUMPY ARRAYS.

**SOURCE CODE:**

import numpy as np

arr1 = np.array([1, 61, 15, 19, 24, 64, 6, 3])

print("Slicing of the numpy array: ")

print(arr1[4:7])

print("Indexing of the numpy arrays")

print(arr1[2])

**OUTPUT:**

#----------Output---------------

#Slicing of the numpy array:

#[24 64 6]

#Indexing of the numpy arrays

#15

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 3:**  WRITE A PROGRAM TO IMPLEMENT A SINGLE RANDOM WALK WITH 1000 STEPS USING THE BUILT-IN RANDOM MODULE

**SOURCE 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()

***LAB ASSIGNMENT 3***

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 1:**  Write A PROGRAM TO SORT A NUMPY ARRAY USING A FUNCTION.

**SOURCE CODE:**

import numpy as nm

from numpy.core.from numeric import sort

def sorting(array):

return sort(array)

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

print("Original array: ")

print(arr)

sorted\_Array = sorting(arr)

print("Sorted array: ")

print(sorted\_Array)

**OUTPUT:**

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

#Original array:

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

#Sorted array:

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

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 2:**  WRITE A PROGRAM TO ADD TWO MATRICES USING FUNCTION.

**SOURCE CODE:**

import numpy as np

def addmatrix(mat1, mat2):

matrix = np.add(mat1, mat2)

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:**

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

# Sum of the two matrix:

# [[ 46 46 174]

# [ 11 4 89]]

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

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 3:**  WRITE A PROGRAM TO DEMONSTRATE THE USAGE OF FILE HANDLING IN PYTHON.

**SOURCE CODE:**

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

txt = "My name is Tanya Gupta. "

file1.write(txt)

file1.close()

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

content = file1.read()

print(content)

file1.close()

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

txt2 = "\nI am studying in the Graphic Era Hill University.\nI am perusing MCA."

file1.write(txt2)

file1.close()

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

for line in file1:

print(line)

file1.close()

file1 = open("D:/python /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("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:**

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

#My name is Tanya Gupta.

#My name is Tanya Gupta.

#I am studying in the Graphic Era Hill University.

#I am persuing MCA.

#Number of line in a file:

#3

#Number of word in a file:

#19

#Number of character in a file:

#77

|  |  |  |
| --- | --- | --- |
| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 4:**  WRITE A PROGRAM TO DEMONSTRATE THE USAGE OF DIFFERENT ELEMENT WISE ARRAY FUNCTIONS.

**SOURCE CODE:**

import numpy as np

arr = np.array([1, 2, 3, 4, 5, 5])

print("Original array: ")

print(arr)

# Adding new element in the array using append function

arr2 = np.append(arr, [3, 3, 5, 32, 5])

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:**

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

#Original array:

#[1 2 3 4 5 5]

#Array after appending new element:

#[ 1 2 3 4 5 5 3 3 5 32 5]

#Sum of a new array:

#68

#Length of a array:

#(11,)

#Mean of the array

#6.181818181818182

#Median of the array:

#4.0

#Max of the array:

#32

#Min of the array:

#1