CHRIST (Deemed to be) University Bangalore

Department of Computer Science

MCA171 Python Programming

Lab Exercises VI

**TOJIN VARKEY SIMSON**

**2447253 MCA-B**

Scenario overview:

You are tasked with analyzing a dataset of employee performance in different de-

partments of a company. Each employee has the following attributes:

(1) Employee ID: Unique identifier (integer).

(2) Department: The department the employee works in (string)

(3) Years of Experience: Number of years the employee has worked (float).

(4) Projects Completed: Number of projects completed successfully (integer).

(5) Client Satisfaction Rating: Average satisfaction rating provided by clients.

Question

(1) By carefully observing the above scenario, write a python program to perform

the following tasks using NumPy Library, for a data of 20 employees.

(a) Create a structured array with the attributes described above. Populate

the data with reasonable values.

(b) Write a function to filter and return the records of employees working in

a specific department (e.g., 'Engineering', 'HR', 'Marketing'.)

(c) Identify the employee with the highest Client Satisfaction Rating.

(d) Calculate the average number of projects completed and the average years

of experience for the entire dataset.

(e) Identify all employees who have less than 2 years of experience.

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**[**Hint for data generation:

(a) Employee ID: Integers

(b) Department: create a list.

For eg, ['Engineering', 'HR', 'Marketing', 'Sales', etc.].

(c) Years of Experience: float between 0 and 15 years.

(d) Projects Completed: Random integer between 1 and 20.

(e) Client Satisfaction Rating: float value between 1.0 and 5.0.

*You are encouraged to create the dataset by utilizing NumPy's functions for*

*generating random data.]*

**OUTPUT:**

**CODE:** import numpy as np

import random

arr=np.dtype([('Employee ID','i4'),('Department','U20'),('Years of Experience','f4'),('Projects completed','i4'),('Client Satisfaction Rating','f4')])

departments=['HR','Marketing','Sales','Fincance','IT']

data = np.zeros(20, dtype=arr)

for i in range(20):

data[i] = (random.randint(1000, 9999),

random.choice(departments),

round(random.uniform(0, 15), 1),

random.randint(1, 20),

round(random.uniform(1.0, 5.0), 1))

print(data)

def filterDep(data):

for i in departments:

print('\nEmployees working under ',i,'department are:')

filtered\_data = data[data['Department'] == i]

if len(filtered\_data) > 0:

print(filtered\_data)

else:

print(" No employees in this department.")

filterDep(data)

print('\nEmployees with Highest Client Satisfaction Rating are:')

f2 = data[data['Client Satisfaction Rating'] == 5.0]

if len(f2) > 0:

print(f2)

else:

print(" No employees have Highest Client Satisfaction Rating 5.")

average\_pro = np.mean(data['Projects completed'])

print("\nAverage no.of projects completed: ",average\_pro)

average\_exp = np.mean(data['Years of Experience'])

print("\nAverage years of Experience: ",average\_exp)

print("\nEmployees with less than 2 years of experience are: ")

f3 = data[data['Years of Experience'] < 2]

if len(f3) > 0:

print(f3)

else:

print(" No employees have less than 2years of experience.")





