Logo, company name

Description automatically generated

**Tutor-Marked Assignment 1 (TMA01)**

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**Question 1a.**

Graph 1.1: Pie Chart of the number of workers in each department

|  |  |
| --- | --- |
| Unit | **Staff** |
| Admin | 7 |
| C-Level | 1 |
| Engineering | 10 |
| IT | 41 |
| Manufacturing | 169 |
| Sales | 22 |
| Total | 250 |

Table 1.1: Number of workers in each department

As we can see from Graph 1.1, this company has a total of 250 staffs. We can also refer this company as a manufacturing company as it consists of a total 169 staffs in the manufacturing Unit. The next largest Unit in the company is IT with 41 staffs, to ensure that the machines and all the technical stuff is working accordingly.

Followed by Sales and Engineering with 22 and 10 staff. It is to ensure the sales of the company products are able to catch buyers attention and the engineering team to solve issues and try to fix the problems related to the machine in used.

The least would be the admin and C-level with 7 and 1 respectively. As it would only need a small group of admin team to manage the employment, HR and learning for the company. With 1 chief level director to foresee and manage the whole company.

Amount

Unit

$71,426.59

$59,412.91

$95,550.76

$95,867

$250,000

$77,315.29

$77,315.29

Graph 1.2: Bar Chart of Average Annual Salary per Department in the Company

|  |  |
| --- | --- |
| **Unit** | **Average Salary** |
| **Admin** | $77315.29 |
| **C-Level** | $250000 |
| **Engineering** | $95867 |
| **IT** | $95550.76 |
| **Manufacturing** | $59412.91 |
| **Sales** | $71426.59 |

Table 1.2: Average Annual Salary per Department in the Company

From Graph 1.2 and Table 1.2, we can refer that the highest average annual salary would be the C-Level unit with $250,000. Mostly because he is the highest authority individual in the company and there is only 1 staff in the unit.

Following with the engineering and IT unit with $95867 and $95550.76. As they are the most relied and reliable asset to the company to ensure smooth and operatable operations.

Then we have the admin and sales unit with $77315.29 and $71426.59 respectively. Lastly with the lowest average annual salary which is the manufacturing team with $59412.91. This is due to the job scope and the total number of staff needed in the company which makes the average annual salary the lowest.

However, we should not belittle them as they are the backbone of the manufacturing company.

**Question 1b.**

**## Pie Chart**

#### Number of Staff in Each Department

#Number of workers per unit/department

#Total 6 departments

import matplotlib.pyplot as plt

import numpy as np

#Create Data

y = np.array([7, 1, 10, 41, 169, 22])

Unit = ["Admin", "C-level", "Engineering", "IT", "Manufacturing", "Sales"]

colours = ["#A9A9A9", "#FFFF00", "#6B8E23", "#008000", "#4682B4", "#FF8C00"]

plt.pie(y, labels = Unit, colors = colours)

plt.title("Number of Staff in Each Unit", bbox={'facecolor':'0.8', 'pad':5})

plt.show()

**## Summarized Data Table for Pie Chart**

import tabulate

from tabulate import tabulate

#create data

data = [["Admin", 7],

["C-Level", 1],

["Engineering", 10],

["IT", 41],

["Manufacturing", 169],

["Sales", 22]]

#define header names

col\_names = ["Unit", "Staffs"]

#display table

print(tabulate(data, headers=col\_names, tablefmt="fancy\_grid",))

**## Histogram**

### Average Annual Salary For Each Department

from matplotlib import pyplot as plt

import numpy as np

Unit = ["Admin", "C-Level", "Engineering", "IT", "Manufacturing", "Sales"]

Salary = [77315.29, 250000.00, 95867.00, 95550.76, 59412.91, 71426.59]

x = np.arange(len(Salary)) # the label locations

width = 0.6 # the width of the bars

fig, ax = plt.subplots(figsize = (10, 8))

plt.xticks(x)

ax.set\_xticklabels(Unit)

plt.ylabel('Amount')

plt.xlabel('Unit')

plt.title("Average Anual Salary for Each Department")

pps = ax.bar(x - width/2, Salary, width, label='salary')

for p in pps:

height = p.get\_height()

ax.annotate('{}'.format(height),

xy=(p.get\_x() + p.get\_width() / 2, height),

xytext=(0, 0.1), # 3 points vertical offset

textcoords="offset points",

ha='center', va='bottom')

plt.show()

**## Summarized Data Table for Bar Chart**

import tabulate

from tabulate import tabulate

#create data

data = [["Admin", 77315.29],

["C-Level", 250000],

["Engineering", 95867],

["IT", 95550.76],

["Manufacturing", 59412.91],

["Sales", 71426.59]]

#define header names

col\_names = ["Unit", "Average Annual Salary"]

#display table

print(tabulate(data, headers=col\_names, tablefmt="fancy\_grid",))

**Question 1c.**

import pandas as pd

import numpy as np

import datetime

**#Length of Service for all staffs**

df = pd.read\_csv (r'/Users/irfan/Desktop/TMA\_Data.csv')

df = pd.DataFrame(df, columns= ['ID','Staff','JoinDate', 'LeftDate'],)

pd.set\_option('display.max\_rows', df.shape[0]+1)

**#Convert date to same format**

df['JoinDate'] = pd.to\_datetime(df['JoinDate'])

df['LeftDate'] = pd.to\_datetime(df['LeftDate'])

**#Insert date 2022-05-01 for those who have not left the company**

empty = pd.to\_datetime('2022-05-01')

df['LeftDate'] = df['LeftDate'].fillna(empty)

**#Length of service in years**

df['LengthOfService'] = round((((df['LeftDate'] - df['JoinDate']).dt.days)/365),1)

print(df)

**#Minimum Length of service**

minimum = min(df['LengthOfService'])

print("minimum length of service is", minimum,"years" )

**#Maximum Length of service**

maximum = max(df['LengthOfService'])

print("maximum length of service is", maximum, "years")

**#Average Length of service**

def Average(avg):

return sum(avg) / len(avg)

avg = df['LengthOfService']

average = Average(avg)

print("Average length of service is", round(average, 1), "years")

**Question 1d.**

import pandas as pd

import numpy as np

# Input staff name

df = pd.read\_csv (r'/Users/irfan/Desktop/TMA\_Data.csv')

staff = str(input("Please enter staff name:"))

# input whether staff is in the company

if staff in df.values:

print("Yes,", staff, "have worked or currently working in our company")

else:

print("No,", staff, "have not worked in our company")

wrong = False

while not wrong:

wrong = input("Enter staff name again? [Type Y/N]:")

if wrong == 'Y':

EnterAgain = input("Please enter staff name")

elif wrong =='N':

Exit = input("Goodbye")

wrong == True