In [ ]:
```
'''
ASSINGMENT: 1
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [18]:
```
# STRING LENGTH FUNCTIONS
string="Learn about the Data Science"
len(string)
print ("the lenght of the string is :",len(string))
```

```
the lenght of the string is : 28
```

In [3]:
```
# UPPER FUNCTION
string="Learn about the Data Science"
string_upper= ("the upper text of the string is:",string.upper())
print(string_upper )
```

```
('the upper text of the string is:', 'LEARN ABOUT THE DATA SCIENCE')
```

In [7]:
```
# LOWER FUNCTION
string="Learn about the Data Science"
string_lower= ("the lower text of the string is:",string.lower())
print(string_lower )
```

```
('the lower text of the string is:', 'learn about the data science')
```

In [8]:
```
# TITLE FUNCTION
string="Learn about the Data Science"
t1=( "TITLE:" , string.title())
print(t1)
```

```
('TITLE:', 'Learn About The Data Science')
```

In [9]:
```
# COUNT FUNCTION
string="Learn about the Data Science"
string_count=("the count of the string :", string.count("Python"))
print(string_count)
```

```
('the count of the string :', 0)
```

In [11]:
```
# REPLACE FUNCTION
string="Learn about the Data Science"
string_replace= string.replace( "Python for Data Science" , "PDS")
print("the replaced text is :" , string_replace)
```

```
the replaced text is : Learn about the Data Science
```

In [13]:
```
# SPLIT FUNCTION
string="Learn about the Data Science"
string_split = string.split()
print(string_split)
```

```
['Learn', 'about', 'the', 'Data', 'Science']
```

In [14]:
```
list = ['Papaya', 'Beetroot', 'Pineapple', 'Grapes']
# JOIN FUNCTION
join_list = ', '.join(list)
print(join_list)
```

```
Papaya, Beetroot, Pineapple, Grapes
```

In [15]:
```
# INDEX FUNCTION
string="Learn about the Data Science"
print(string.index('Data'))
```

```
16
```

In [ ]:
```

```

In [ ]:
```
'''
ASSINGMENT: 2
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [1]:
```
# LIST FUNCTIONS
list=[11,27,73,89,67,38,49,50]
print("Lenght of the list:" , len(list))
```

```
Lenght of the list: 8
```

In [2]:
```
list=[11,27,73,89,67,38,49,50]
print("Sum of elements of the list:" , sum(list))
```

```
Sum of elements of the list: 404
```

In [4]:
```
list=[11,27,73,89,67,38,49,50]
print("Maximun elements of the list:" , max(list))
```

```
Maximun elements of the list: 89
```

In [5]:
```
list=[11,27,73,89,67,38,49,50]
print("minimum elements of the list:" , min(list))
```

```
minimum elements of the list: 11
```

In [6]:
```
list=[11,27,73,89,67,38,49,50]
print("count function of the list:" , list.count(55))
```

```
count function of the list: 0
```

In [7]:
```
list=[11,27,73,89,67,38,49,50]
list.insert(0,66)
print(list)
```

```
[66, 11, 27, 73, 89, 67, 38, 49, 50]
```

In [8]:
```
list=[11,27,73,89,67,38,49,50]
list.reverse()
print(list)
```

```
[50, 49, 38, 67, 89, 73, 27, 11]
```

In [9]:
```
list=[11,27,73,89,67,38,49,50]
list.sort()
print("sorted list", list)
```

```
sorted list [11, 27, 38, 49, 50, 67, 73, 89]
```

In [10]:
```
list=[11,27,73,89,67,38,49,50]
list.sort(reverse=True)
print("sorted list in descending order:",list)
```

```
sorted list in descending order: [89, 73, 67, 50, 49, 38, 27, 11]
```

In [11]:
```
list=[11,27,73,89,67,38,49,50]
list.append(100)
print("appended list",list)
```

```
appended list [11, 27, 73, 89, 67, 38, 49, 50, 100]
```

In [12]:
```
list=[11,27,73,89,67,38,49,50]
a=[77,78]
list.extend(a)
print("extended list", list)
```

```
extended list [11, 27, 73, 89, 67, 38, 49, 50, 77, 78]
```

In [ ]:
```
'''
ASSINGMENT: 3
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [ ]:
```
# Basic calculator
a= input("enter the arethematic operator ADD , SUBTRACTION, MULTIPLICATION
b = int(input("enter the num1 :"))
c= int(input("enter the num2 : "))

if ( a == "ADD"):
 print (b+c)

elif ( a == "SUBTRACTION"):
  print(b-c)

elif ( a == "MULTIPLICATION"):
  print(b*c)

elif ( a == "DIVISION"):
  print(b/c)

elif ( a == "MODULUS"):
   print(b%c)

elif ( a == "POWER"):
    print(b**c)

else:
    print("INVALID INPUT"):
```

In [ ]:
```
'''
ASSINGMENT: 4
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [1]:
```
# ASSINGMENT OPERATOR
x=30
y=50
z=8
z=x+y
print("assingment operator",z)
```

```
assingment operator 80
```

In [2]:
```
# ADDITION ASSINGMENT OPERATOR
x=30
y=50
z=8
z+=x
print("addition assingment operator",z)
```

```
addition assingment operator 38
```

In [3]:
```
# SUBTRACTION ASSINGMENT OPERATOR
x=30
y=50
z=8
z-=x
z=z=x
print( "sustraction assingment operator",z)
```

```
sustraction assingment operator 30
```

In [4]:
```
# MULTIPLICATION ASSINGMENT OPERATOR
x=30
y=50
z=8
z*-x
z=z/x
print("nultiplication assingment operator",z)
```

```
nultiplication assingment operator 0.26666666666666666
```

In [5]:
```
# DIVISION ASSINGMENT OPERATOR
x=float(30)
y=float(50)
z=float(8)
z/=x
z=z/x
print("division assingment operator",z)
```

```
division assingment operator 0.008888888888888889
```

In [6]:
```
# MODULAS ASSINGMENT OPERATOR
x=30
y=50
z=8
z%=x
```

```
z=z%x
print("modulas assingment operator",z)
```

```
modulas assingment operator 8
```

In [ ]:
```
'''
ASSINGMENT: 5
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [2]:
```
# Greater Than Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a > b):
    print("A is greater than 8")
else:
    print("B is greater than A")
```

```
Enter value of a: 45
Enter value of b: 84
 is greater than A
```

In [3]:
```
# Less Than Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a < b):
    print("A is less than B")
else:
    print("B is less than A")
```

```
Enter value of a: 95
Enter value of b: 48
B is less than A
```

In [4]:
```
# Equal to Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a == b):
    print("Both A and B are equal")
```

```
Enter value of a: 89
Enter value of b: 89
Both A and B are equal
```

In [5]:
```
# NotEqual to Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a != b):
    print("Both A and B are not equal")
```

```
Enter value of a: 96
Enter value of b: 69
Both A and B are not equal
```

In [6]:
```
# Greater Than Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a >= b):
```

```
    print("A is either greater than or equal to B")
else:
    print("B is either greater than or equal to A")
```

```
Enter value of a: 189
Enter value of b: 189
A is either greater than or equal to B
```

In [7]:

```
# Less Than Operator
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if (a >= b):
    print("A is either less than or equal to B")
else:
    print("B is either less than or equal to A")
```

```
Enter value of a: 45
Enter value of b: 89
B is either less than or equal to A
```

In [ ]:
```
'''
ASSINGMENT: 6
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [3]:
```
# Logical operator
x=24
y=15
if x>10 and y<10:
   print("x is greater than 10 and y is less than 10")
else:
   print("False")
```

```
False
```

In [4]:
```
# OR operator
x=24
y=15
if x>10 or y>10:
  print("Either x or y is greater than 10")
else:
  print("none of the number is greater than 10")
```

```
Either x or y is greater than 10
```

In [5]:
```
# not operator
x=24
if not x == 15:
  print("The value of 'a' is not 12")
else:
  print("The value of 'a' is 12")
```

```
The value of 'a' is not 12
```

In [ ]:
```
'''
ASSINGMENT: 7
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [2]:
```
# IN operator
x = 28
numbers = [14, 28, 23, 11, 17]
if x in numbers:
  print(x ,"is present in the list")
else:
  print (x, "is not present in the list")
```

```
28 is present in the list
```

In [3]:
```
# NOT IN OPERATOR
x = 96
numbers = [14, 28, 23, 11, 17]
if x not in numbers:
 print(x , "is not present in the list")
```

```
96 is not present in the list
```

In [5]:
```
# IS OPERATOR
numbers = [14, 28, 23, 11, 17]
values = [14, 28, 23, 11, 17]
if numbers is values:
  print("numbers and values refer to the same object")
```

In [ ]:
```

```

In [ ]:
```
'''
ASSINGMENT: 8
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [2]:
```
# sin function
import math
a= math.sin(-22.22)
b= math.sin(11.11)
print(a)
print(b)
```

```
0.2268590443994766
-0.9934605180929019
```

In [3]:
```
# cos function
a= math.cos(-22.22)
b= math.cos(11.11)
print(a)
print(b)
```

```
-0.973927602018834
0.1141761752318889
```

In [4]:
```
# tan function
a= math.tan(-22.22)
b= math.tan(11.11)
print(a)
print(b)
```

```
-0.2329321439593921
-8.701119266565103
```

In [5]:
```
# exponential function
math.exp(45)
```

Out[5]:
```
3.4934271057485095e+19
```

In [6]:
```
# fabs function
a=math.fabs(736)
b=math.fabs(-736)
print(a)
print(b)
```

```
736.0
736.0
```

In [7]:
```
# factorial function
math.factorial(15)
```

Out[7]:
```
1307674368000
```

In [8]:
```
#fsum function
math.fsum(range(16))
```

Out[8]:
```
120.0
```

In [9]:
```
# Squareroot function
math.sqrt(17)
```

Out[9]:
```
4.123105625617661
```

In [10]:
```
# power function
math.pow(10,3)
```

Out[10]:
```
1000.0
```

In [11]:
```
# trunc function
math.trunc(11.67)
```

Out[11]:
```
11
```

In [12]:
```
# isnan function
math.isnan(19)
```

Out[12]:
```
False
```

In [ ]:

In [ ]:
```
'''
ASSINGMENT: 9
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [3]:
```
# IF STATEMENT
x = 17
if x > 0:
 print("x is positive")
```

```
x is positive
```

In [5]:
```
# IF...ELIF...ELSE
x = 0
if x > 0:
  print("x is positive")
elif x == 0:
  print("x is zero")
else:
  print("x is negative")
```

```
x is zero
```

In [4]:
```
# WHILE STATEMENT
count = 0
while count < 3:
   print(f"Count: {count}")
   count += 1
```

```
Count: 0
Count: 1
Count: 2
```

In [12]:
```
# FOR STATEMENT
fruits = ["Pineapple", "Beetroot", "Papaya", "Grapes"]
for fruit in fruits:
  print(fruit)
```

```
Pineapple
Beetroot
Papaya
Grapes
```

In [13]:
```
# BREAK
for i in range(10):
  if i == 4:
      break
  print(i)
```

```
0
1
2
3
```

In [24]:
```
# CONTINUE
for i in range(10):
    if i == 4:
```

```
        continue
    print(i)
```

```
0
1
2
3
5
6
7
8
9
```

In [27]:
```
# PASS STATEMENT
for x in [0, 1, 2]:
    pas
```

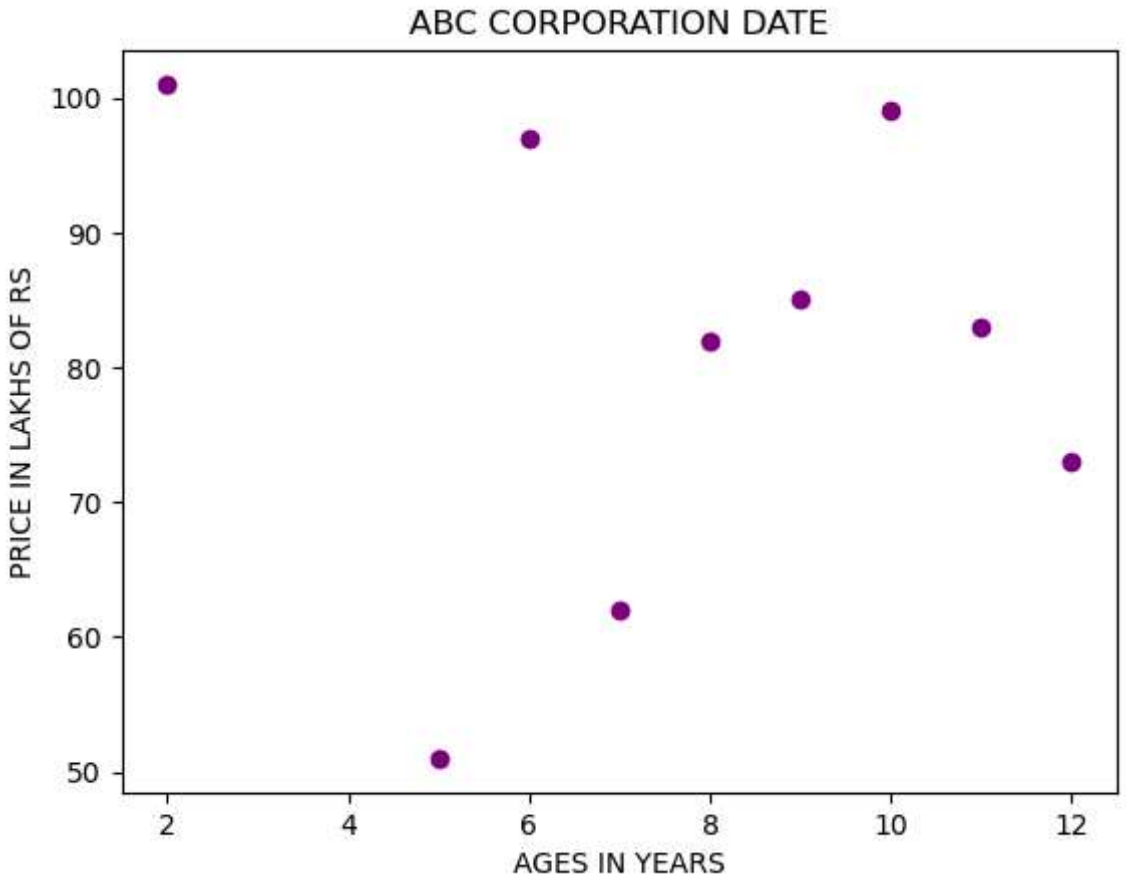
In [26]:
```
# WRITTEN STATEMENT
print("GoodToKnow")
a=11
print(a)
```

```
GoodToKnow
11
```

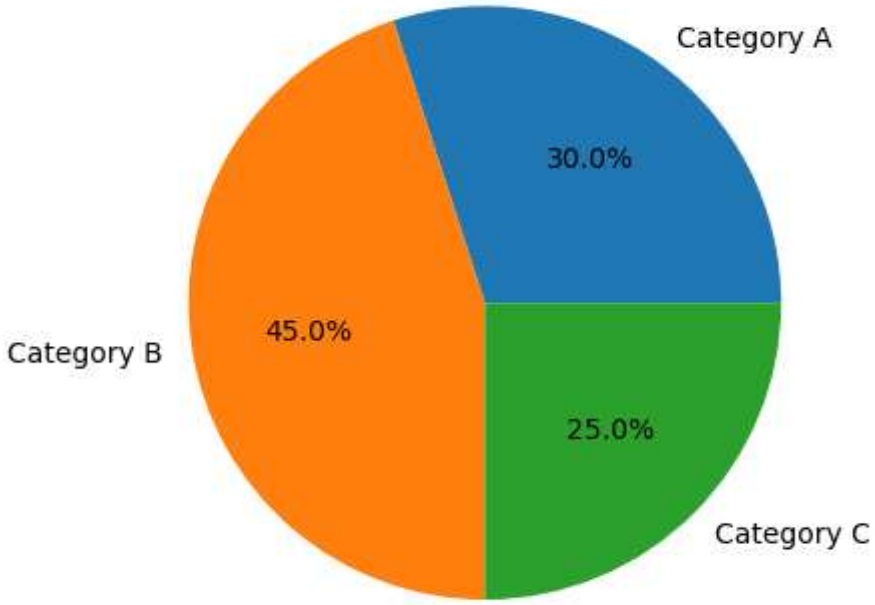
In [ ]:
```

```

In [ ]:
```
'''
ASSINGMENT: 10
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

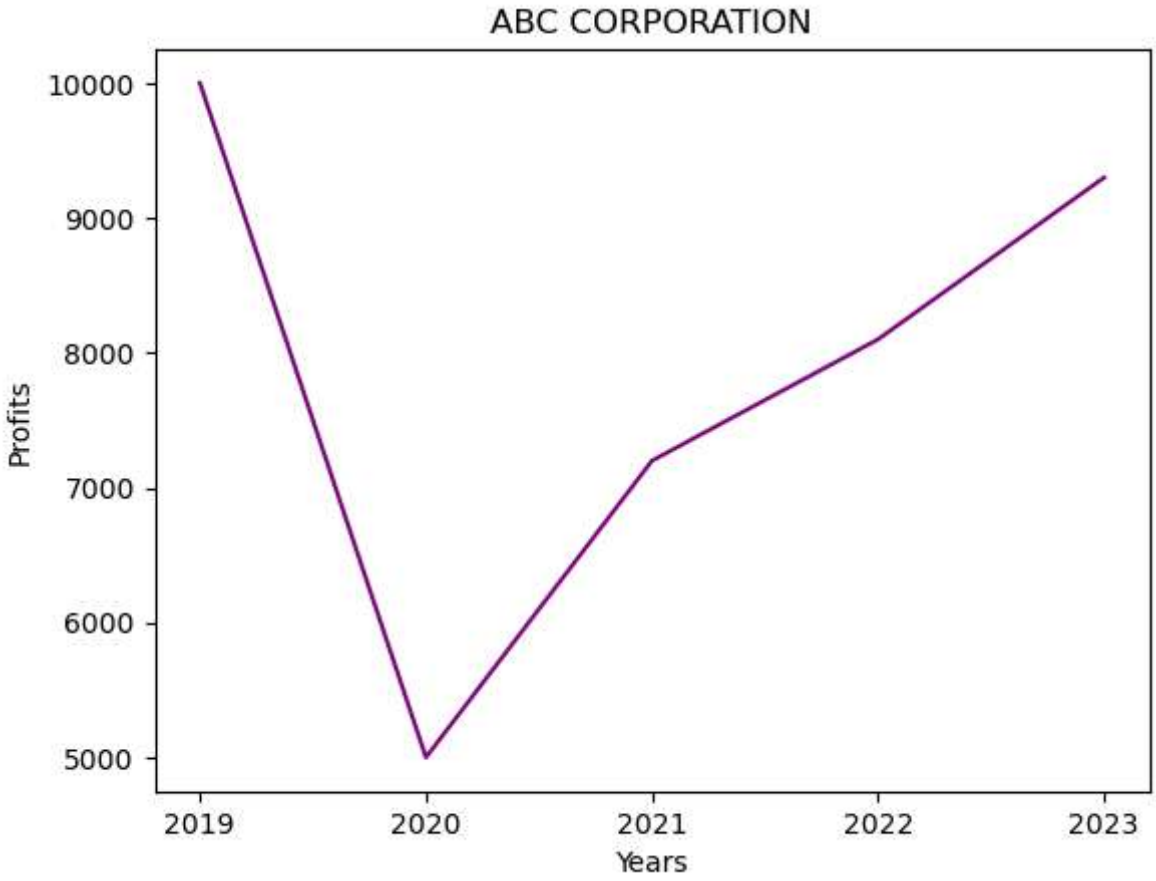
In [2]:
```
# Application of matplotlib and seaborn to draw graph (5 from matplotlib
# 5 matplotlib graph

# SCATTER PLOT
import seaborn as sns
import matplotlib.pyplot as plt
Age = [6,8,9,2,10,11,12,7,5]
Prices=[97,82,85,101,99,83,73,62,51]
plt.scatter(Age,Prices,color='Purple')
plt.title('ABC CORPORATION DATE')
plt.xlabel('AGES IN YEARS')
plt.ylabel('PRICE IN LAKHS OF RS')
plt.show()
```



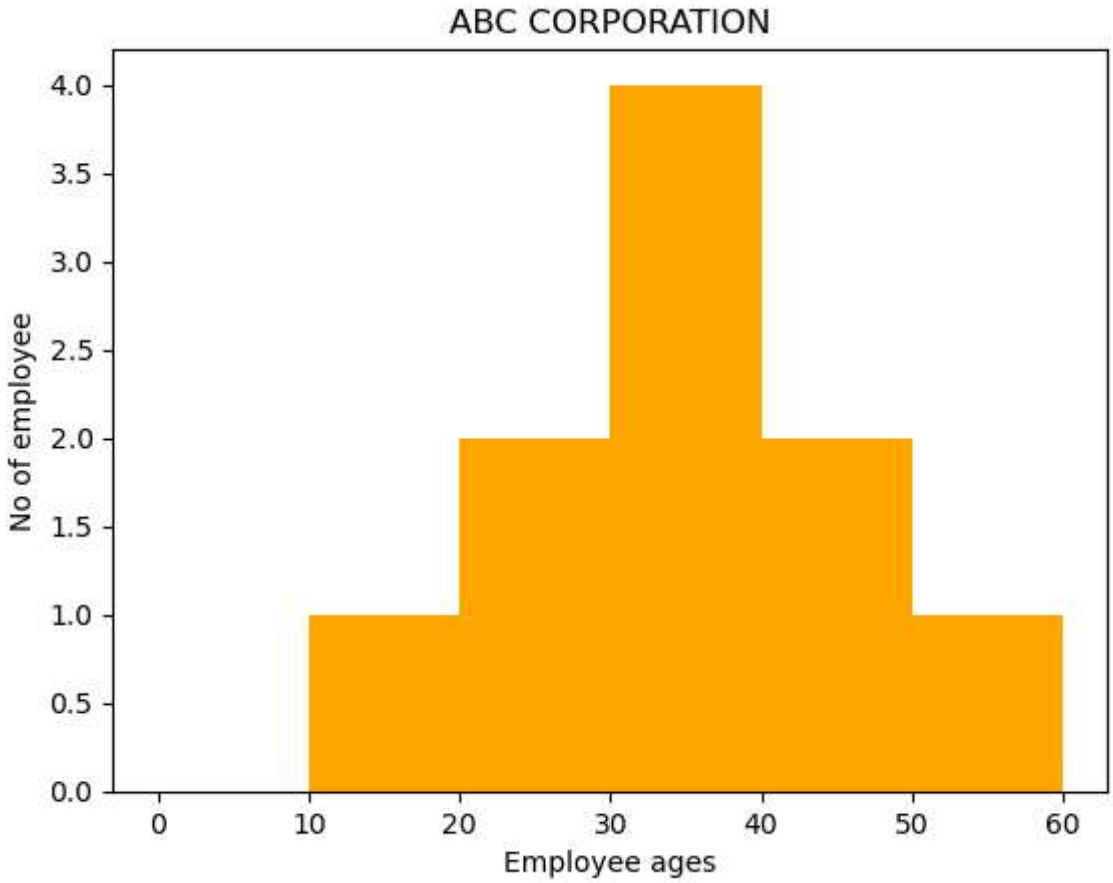
In [12]:
```
# PIE CHART
import matplotlib.pyplot as plt
labels = ['Category A', 'Category B', 'Category C']
sizes = [30, 45, 25]
plt.pie(sizes, labels=labels, autopct='%1.1f%%')
plt.show()
```



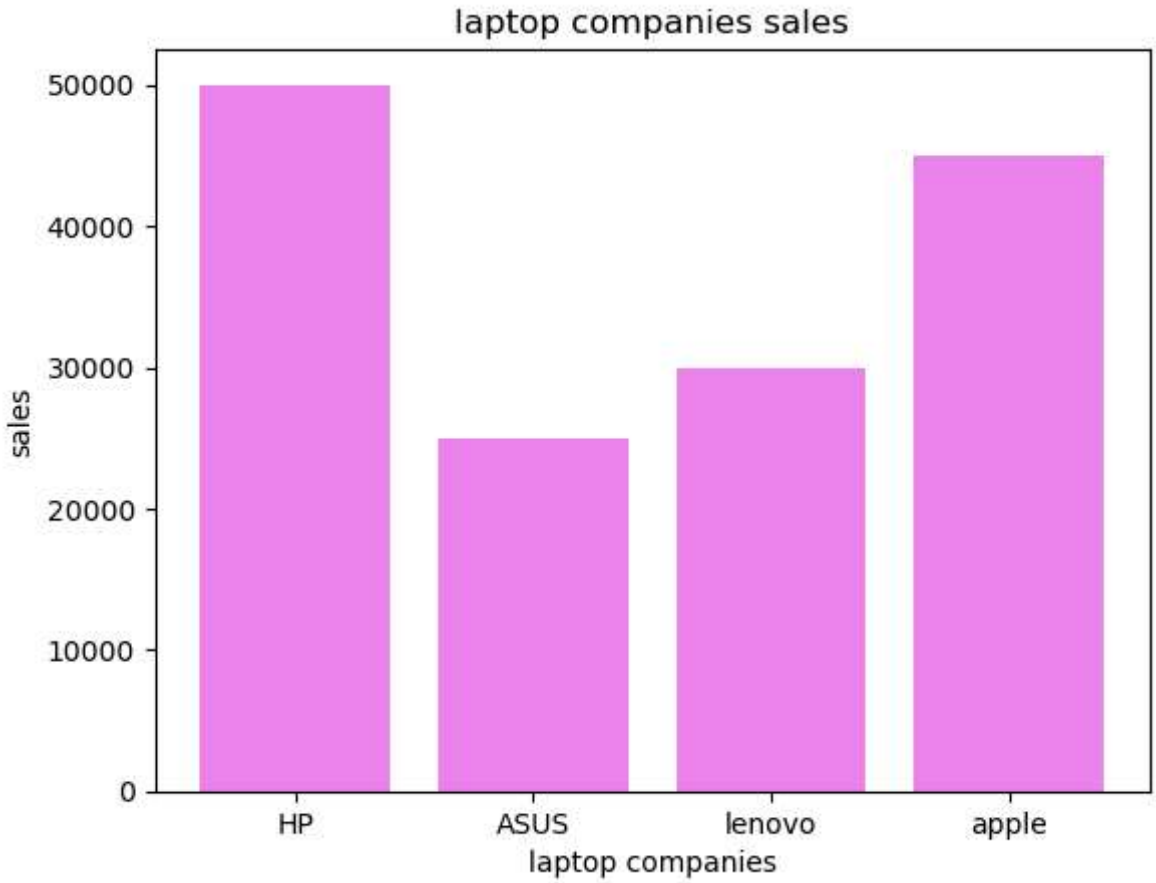
In [4]:
```
# LINE GRAPH
Years=['2019','2020','2021','2022','2023']
Profits=[10000,5000,7200,8100,9300]
plt.plot(Years,Profits, color='Purple')
plt.xlabel('Years')
plt.ylabel('Profits')
plt.title('ABC CORPORATION')
plt.show()
```



In [6]:
```
# CREATE HISTROGRAM
import pandas as pd
import matplotlib.pyplot as plt
emp_ages= [23,45,30,39,58,43,34,32,25,19]
bins= [0,10,20,30,40,50,60]
plt.hist(emp_ages,bins, histtype='bar',rwidth=1,color='ORANGE')
plt.xlabel('Employee ages')
plt.ylabel('No of employee')
plt.title('ABC CORPORATION')
plt.show()
```

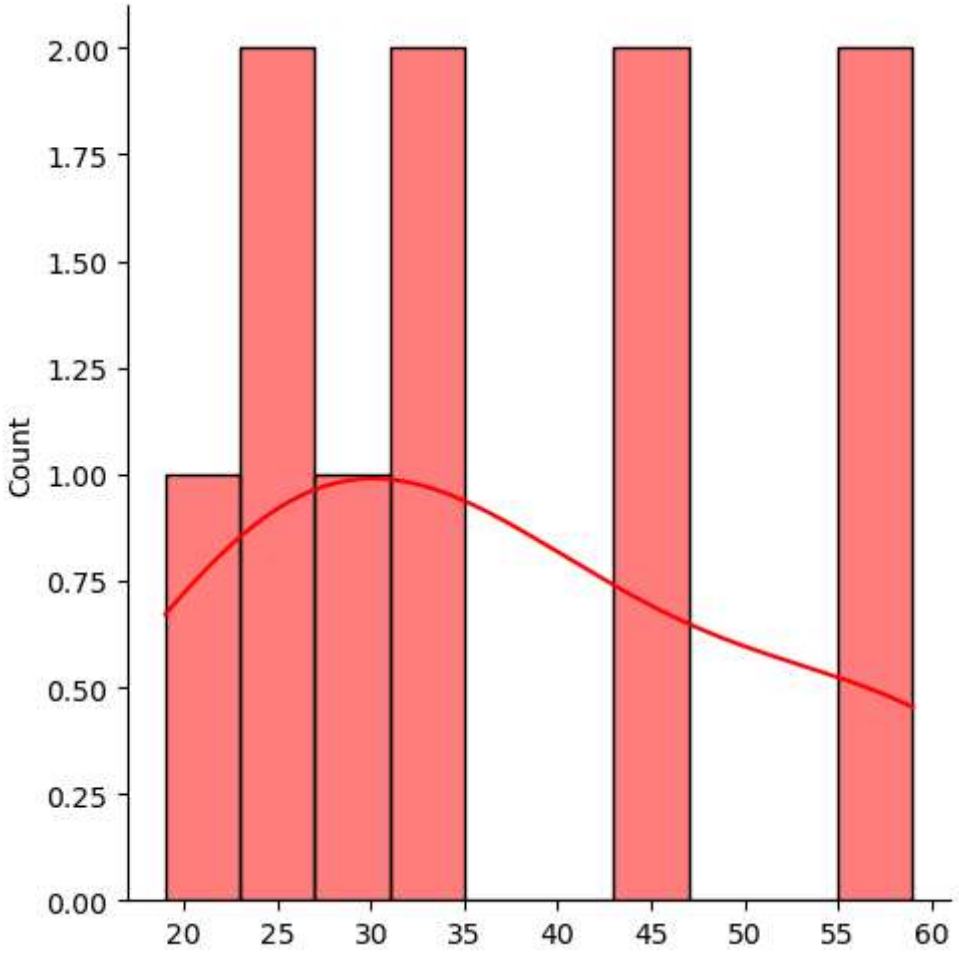


In [7]:
```
# Creating a bar graph
laptop_companies = ['HP', 'ASUS', 'lenovo', 'apple']
sales = [50000, 25000, 30000, 45000]
plt.bar(laptop_companies, sales, color='VIOLET')
plt.xlabel('laptop companies')
plt.ylabel('sales')
plt.title('laptop companies sales')
plt.show()
```

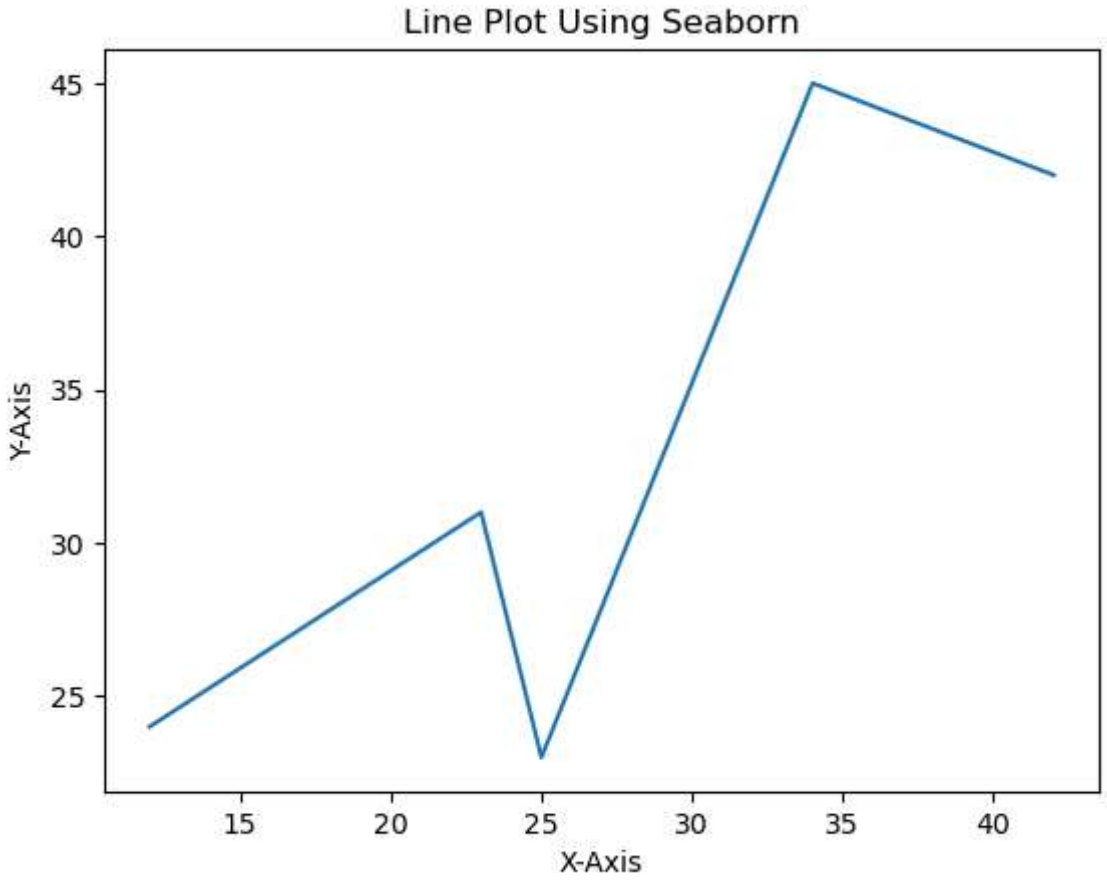


In [8]:
```
# distribution plot
x=[23,45,30,59,58,43,34,33,25,19]
sns.displot(x,bins=10,kde=True,color='red')
plt.show()
```

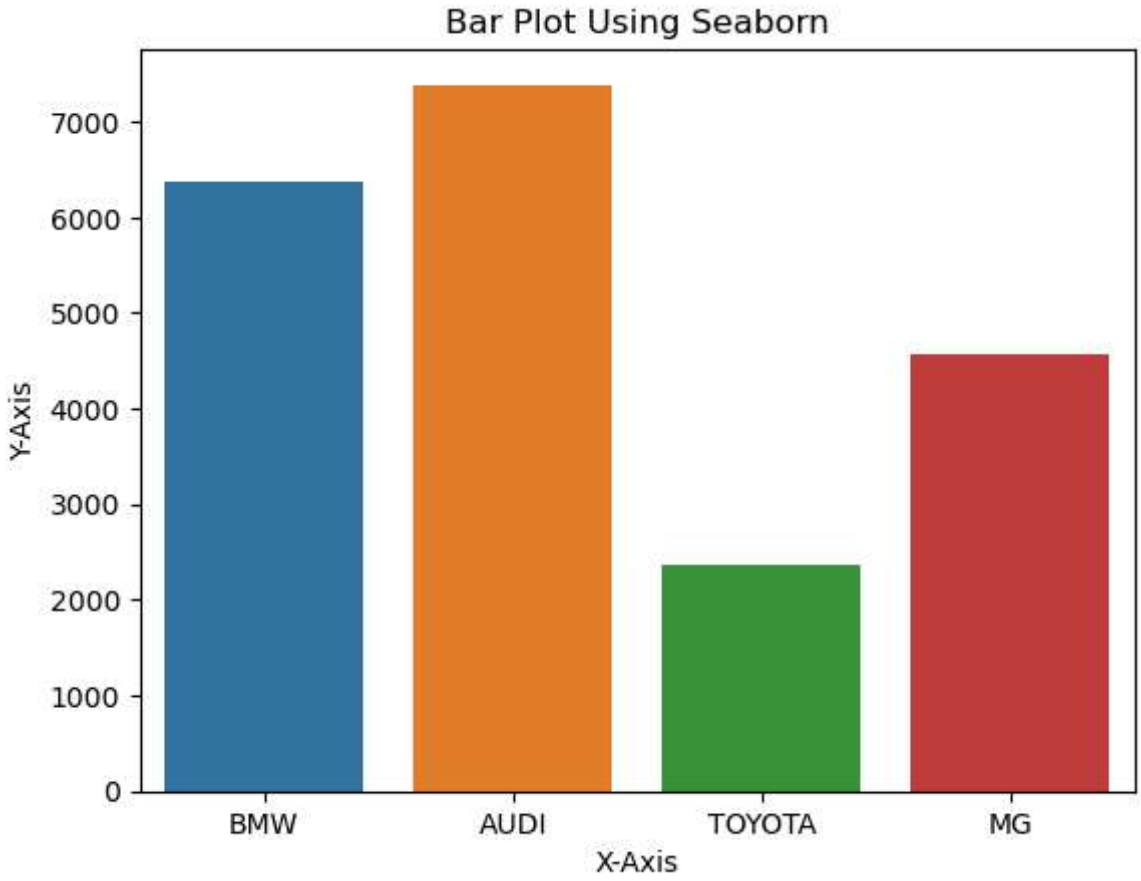
```
C:\Users\samee\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The
figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```



In [9]:
```
# creating Line plot using seaborn
x = [12,42,23,34,25]
y = [24,42,31,45,23]
sns.lineplot(x=x, y=y)
plt.title ("Line Plot Using Seaborn")
plt.xlabel("X-Axis")
plt.ylabel("Y-Axis")
plt.show()
```



In [10]:
```
# creating the bar plot
categories = ['BMW', 'AUDI', 'TOYOTA', 'MG']
values = [6376, 7387,2356,4569]
sns.barplot(x = categories, y = values)
plt.title("Bar Plot Using Seaborn")
plt.xlabel("X-Axis")
plt.ylabel("Y-Axis")
plt.show()
```


Bar Plot Using Seaborn
7000
6000
5000
4000
3000
2000
1000
0
Y-Axis
BMW
AUDI
TOYOTA
MG
X-Axis

In [ ]:
```
'''
ASSINGMENT: 11
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [1]:
```
# ARRAY FUNCTION
import numpy as np
# 1. int
arr = np.array([11,22,14,56])

# 2. float
float = np.array([11.11,22.6,44.3,52.24])

# 3. character
char = np.array([])

# 4. string
str = np.array(["Python ", "For", "Data", "Science"])

# 5. mixed
mixed = np.array([12,22,14,56,11.11,22.6,44.3,52.24])

print("Integer array is: ",arr)
print("Float array is: ", float)
print("Character array is: ", char)
print("String array is: ", str)
print("Mixed array is: ", mixed)
```

```
Integer array is:  [11 22 14 56]
Float array is:  [11.11 22.6  44.3  52.24]
Character array is:  []
String array is:  ['Python ' 'For' 'Data' 'Science']
Mixed array is:  [12.   22.   14.   56.   11.11 22.6  44.3  52.24]
```

In [3]:
```
# Lin space function
a=np.linspace(22,66,4)
print(a)
```

```
[22.         36.66666667 51.33333333 66.        ]
```

In [4]:
```
# Arrange number
a=np.arange(22,66,4)
print(a)
```

```
[22 26 30 34 38 42 46 50 54 58 62]
```

In [5]:
```
#Zeros and ones
z=np.zeros(30)
o=np.ones(20)
print(o)
print(z)
```

```
[1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]
[0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0.]
```

In [6]:
```
# Log space
log=np.logspace(11,6,5)
```

```
print(log)
```

```
[1.00000000e+11 5.62341325e+09 3.16227766e+08 1.77827941e+07
 1.00000000e+06]
```

In [7]:
```
# Operations In Arrays
# sin(arr)
n = np.array([56,38,34,22])
np.sin(n)
```

Out[7]:
```
array([-0.521551  ,  0.29636858,  0.52908269, -0.00885131])
```

In [8]:
```
# cos(arr)
np.cos(n)
```

Out[8]:
```
array([ 0.85322011,  0.95507364, -0.84857027, -0.99996083])
```

In [9]:
```
# tan(arr)
n = np.array([56,38,34,22])
np.tan(n)
```

Out[9]:
```
array([-0.61127369,  0.31030966, -0.62349896,  0.00885166])
```

In [10]:
```
# log(arr)
n = np.array([56,38,34,22])
np.log(n)
```

Out[10]:
```
array([4.02535169, 3.63758616, 3.52636052, 3.09104245])
```

In [11]:
```
# abs(arr)
n = np.array([56,38,34,22])
np.abs(n)
```

Out[11]:
```
array([56, 38, 34, 22])
```

In [12]:
```
# power(arr,n)
n = np.array([56,38,34,22])
np.power(n,2)
```

Out[12]:
```
array([3136, 1444, 1156,  484], dtype=int32)
```

In [13]:
```
# exp(arr)
n = np.array([56,38,34,22])
np.exp(n)
```

Out[13]:
```
array([2.09165950e+24, 3.18559318e+16, 5.83461743e+14, 3.58491285e+09])
```

In [14]:
```
# sum(arr)
n = np.array([56,38,34,22])
np.sum(n)
```

Out[14]:
```
150
```

In [15]:
```
# Prod(arr)
n = np.array([56,38,34,22])
np.prod(n)
```

Out[15]:
```
1591744
```

In [16]:
```
# min(arr)
n = np.array([56,38,34,22])
np.min(n)
```

Out[16]:
```
22
```

In [17]:
```
# max(arr)
n = np.array([56,38,34,22])
np.max(n)
```

Out[17]:
```
56
```

In [18]:
```
# mean(arr)
n = np.array([56,38,34,22])
np.mean(n)
```

Out[18]:
```
37.5
```

In [19]:
```
# median(arr)
n = np.array([56,38,34,22])
np.median(n)
```

Out[19]:
```
36.0
```

In [20]:
```
# var(arr)
n = np.array([56,38,34,22])
np.var(n)
```

Out[20]:
```
148.75
```

In [21]:
```
# std(arr)
n = np.array([56,38,34,22])
np.std(n)
```

Out[21]:
```
12.196310917650468
```

In [22]:
```
# unique(arr)
n = np.array([56,38,34,22])
np.unique(n)
```

Out[22]:
```
array([22, 34, 38, 56])
```

In [23]:
```
#concatenate([x,y])
x=np.array([[19,84,65], [36, 52, 56]])
y=np.array([[54, 63, 17], [18, 41, 22]])
np.concatenate((x,y),axis=1)
```

Out[23]:
```
array([[19, 84, 65, 54, 63, 17],
       [36, 52, 56, 18, 41, 22]])
```

In [ ]:
```
'''
ASSINGMENT: 12
NAME: Sameer Kumar Singh
PRN: 22030121189
'''
```

In [4]:
```
'''
we can apply different functions in matrix.
1. diagonal() - used to find out diagonal element of a matrox. 2. max()
-
3. sum() and mean() -
4. prod() - product of elements
5. sort()
6. transpose()
'''
import numpy as np
a = np.matrix('7,6,5;4,3,2;8,9,10')
print(a)
```

```
[[ 7  6  5]
 [ 4  3  2]
 [ 8  9 10]]
```

In [5]:
```
# Diagonal
a = np.matrix('7,6,5;4,3,2;8,9,10')
diagonal=np.diagonal(a)
print(diagonal)
```

```
[ 7  3 10]
```

In [6]:
```
# max
a = np.matrix('7,6,5;4,3,2;8,9,10')
max = np.max(a)
print(max)
```

```
10
```

In [11]:
```
# min
a = np.matrix('7,6,5;4,3,2;8,9,10')
min= np.min(a)
print(min)
```

```
2
```

In [8]:
```
# sum
a = np.matrix('7,6,5;4,3,2;8,9,10')
sum = np.sum(a)
print(sum)
```

```
54
```

In [9]:
```
# average
a = np.matrix('7,6,5;4,3,2;8,9,10')
average = np.mean(a)
print(average)
```

```
6.0
```

In [13]:
```
import numpy as np
```

```
a = np.matrix('7,6,5;4,3,2;8,9,10')
product = np.dot(a, a.T)  # Matrix multiplication

print("Matrix multiplication result:")
print(product)

import numpy as np
a = np.matrix('7,6,5;4,3,2;8,9,10')
product = np.dot(a, a.T)
print("Matrix multiplication result:")
print(product)
```

```
Matrix multiplication result:
[[110  56 160]
 [ 56  29  79]
 [160  79 245]]
```

In [ ]: