COURSE OUTCOME- 4

Date: 27/11/2023

1. Create Rectangle class with attributes length and breadth and methods to find area and perimeter. Compare two Rectangle objects by their area.

PROGRAM

```
class Rectangle:
def __init__(self,length,breadth):
self.length=length
self.breadth=breadth
def area(self):
return self.length*self.breadth
def perimeter(self):
return 2*(self.length+self.breadth)
def compare(self, otherrectangle):
if self.area()>otherrectangle.area():
return "The first rectangle has a larger area."
elif self.area()<otherrectangle.area():
return "The second rectangle has a larger area."
else:
return "Both rectangles have the same area."
x=int(input("Enter length :"))
y=int(input("Enter breadth :"))
rectangle1 = Rectangle(x, y)
print("Area of rectangle1:",rectangle1.area())
print("Perimeter of rectangle2:",rectangle1.perimeter())
rectangle2 = Rectangle(x, y)
print("Area of rectangle2:",rectangle1.area())
print("Perimeter of rectangle2:",rectangle1.perimeter())
z = rectangle1.compare(rectangle2)
print(z)
```

OUTPUT

```
Enter length :1
Enter breadth :2
Area of rectangle1: 2
Perimeter of rectangle2: 6
Area of rectangle2: 2
Perimeter of rectangle2: 6
Both rectangles have the same area.
```

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2. Create a Bank account with members account number, name, type of account and balance. Write constructor and methods to deposit at the bank and withdraw an amount from the bank.

PROGRAM

```
class BankAccount:
def __init__(self, account_number, account_holder_name, account_type,
balance):
self.account_number = account_number
self.account_holder_name = account_holder_name
self.account_type = account_type
self.balance = balance
def deposit(self, amount):
if amount>0:
self.balance += amount
print("Deposit successful of ", amount)
print("New balace=",self.balance)
else:
print("Invalid deposit amount.")
def withdraw(self, amount):
if 0<amount<self.balance:
self.balance=self.balance-amount
elif amount>self.balance:
print("Not possible to withdraw")
else:
print("invalid")
def getbalance(self):
print("Current balance=",self.balance)
ano=int(input("Enter account number:"))
name=input("Enter account holder:")
atype=input("Enter account type:")
amt=int(input("Enter account initial balance:"))
account1=BankAccount(ano,name,atype,amt)
account1.getbalance()
```

```
ch=0
while(ch!=4):43
print("\n\n1.Deposit amount\n2.Withdraw amount\n3.See account
balance\n4.Exit");
ch=int(input("Enter choice"))
if ch==1:
damount=int(input("Enter the amount to be deposited:"))
account1.deposit(damount)
elif ch==2:
wamount=int(input("Enter the amount to be withdrawn:"))
account1.withdraw(wamount)
account1.getbalance()
elif ch==3:
account1.getbalance()
else:
print("Invalid");
```

OUTPUT

```
Enter account number:789
Enter account holder:Abhi
Enter account type:savings
Enter account initial balance:1000
Current balance= 1000
1.Deposit amount
2.Withdraw amount
3.See account balance
4.Exit
Enter choice1
Enter the amount to be deposited:2000
Deposit successful of 2000
New balace= 3000
1.Deposit amount
2.Withdraw amount
3.See account balance
4.Exit
```

```
Enter choice2
Enter the amount to be withdrawn:199944
Current balance= 1001
1.Deposit amount
2.Withdraw amount
3.See account balance
4.Exit
Enter choice3
Current balance= 1001
1.Deposit amount
2.Withdraw amount
3.See account balance
4.Exit
Enter choice4
Invalid
```

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3.Create a class Rectangle with private attributes length and width. Overload '<' operator to compare the area of 2 rectangles.

PROGRAM

```
class Rectangle:
def __init__(self, length, width):
self._length = length
self._width = width
def area(self):
return self._length * self._width
def __lt__(self, other):
return self.area()>other.area()
x=int(input("Enter length of rectangle1:"))
y=int(input("Enter width of rectangle1:"))
m=int(input("Enter length of rectangle2:"))
n=int(input("Enter width of rectangle2:"))
rectangle1 = Rectangle(x,y)
rectangle2 = Rectangle(m,n)
if rectangle1<rectangle2:
print("Area of Rectangle 1 is smaller than the area of Rectangle 2.")
elif rectangle1>rectangle2:
print("Area of Rectangle 1 is larger than the area of Rectangle 2.")
else:
print("Both rectangles have the same area.")
```

OUTPUT

```
Enter length of rectangle1:3
Enter width of rectangle1:4
Enter length of rectangle2:7
Enter width of rectangle2:5
Area of Rectangle 1 is larger than the area of Rectangle 2.
```

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4. Create a class Time with private attributes hour, minute and second. Overload '+' operator to find sum of 2 time

PROGRAM

```
class Time:
def __init__(self, hour=0, minute=0, second=0):
self._hour = hour
self._minute = minute
self._second = second
def __add__(self, other):
total_seconds = self._hour * 3600 + self._minute * 60 + self._second + \
other._hour * 3600 + other._minute * 60 + other._second
new_hour, remainder = divmod(total_seconds, 3600)
new_minute, new_second = divmod(remainder, 60)
return Time(new_hour, new_minute, new_second)
def __str__(self):
return f"{self._hour:02d}:{self._minute:02d}:{self._second:02d}";
x1=int(input("Enter hour of first time:"))
y1=int(input("Enter minute of first time:"))
z1=int(input("Enter second of first time:"))
x2=int(input("Enter hour of next time:"))
y2=int(input("Enter minute of next time:"))
z2=int(input("Enter second of next time:"))
time1 = Time(x1,y1,z1)
time2 = Time(x2,y2,z2)
sum_time = time1 + time2
print("Time 1:", time1)
print("Time 2:", time2)
print("Sum of Time 1 and Time 2:", sum_time)
```

OUTPUT

```
Enter hour of first time:3
Enter minute of first time:45
Enter second of first time:30

Enter hour of next time:1
Enter minute of next time:30
Enter second of next time:15

Time 1: 03:45:30
Time 2: 01:30:15
Sum of Time 1 and Time 2: 05:15:45
```

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5. Create a class Publisher (name). Derive class Book from Publisher with attributes title and author. Derive class Python from Book with attributes price and no_of_pages. Write a program that displays information about a Python book. Use base class constructor invocation and method overriding.

PROGRAM

```
class Publisher:
def __init__(self, name):
self.name = name

class Book(Publisher):
def __init__(self, name, title, author):
super().__init__(name)
self.title = title
self.author = author

def display_info(self):
print("Publisher:", self.name)
print("Title:", self.title)
print("Author:", self.author)

class Python(Book):
def __init__(self, name, title, author, price, no_of_pages):
super().__init__(name, title, author)
self.price = price
self.no_of_pages = no_of_pages

def display_info(self):
super().display_info()
print("Price:", self.price)
print("Number of Pages:", self.no_of_pages)

name=input("Enter Publisher:")
title=input("Enter title:")
```

```
author=input("Enter author:")
price=int(input("Enter price:"))
no_of_pages=int(input("Enter number of pages:"))
python_book = Python(name,title,author,price,no_of_pages)
python_book.display_info()
```

OUTPUT

```
Enter Publisher:Penquin books
Enter title:House of cards
Enter author:Sudha Murty
Enter price:200
Enter number of pages:195
Publisher: Penquin books
Title: House of cards
Author: Sudha Murty
Price: 200
Number of Pages: 195
```