

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_area(self, other_rectangle):

        if self.area() > other_rectangle.area():

            return "The first rectangle has a larger area."

        elif self.area() < other_rectangle.area():

            return "The second rectangle has a larger area."

        else:

            return "Both rectangles have the same area."

print("first rectangle: ")

length=int(input("Enter the length of the rectangle:"))

breadth=int(input("Enter the breadth of the rectangle:"))
```

```
rectangle1 = Rectangle(length,breadth)

print("Area of Rectangle 1:", rectangle1.area())

print("Perimeter of Rectangle 1:", rectangle1.perimeter())

print("second rectangle: ")

length=int(input("Enter the length of the rectangle:"))

breadth=int(input("Enter the breadth of the rectangle:"))

rectangle2 = Rectangle(length,breadth)

print("Area of Rectangle 1:", rectangle2.area())

print("Perimeter of Rectangle 1:", rectangle2.perimeter())

comparison_result = rectangle1.compare_area(rectangle2)

print(comparison_result)
```

Output

first rectangle:

Enter the length of the rectangle:5

Enter the breadth of the rectangle:6

Area of Rectangle 1: 30

Perimeter of Rectangle 1: 22

second rectangle:

Enter the length of the rectangle:8

Enter the breadth of the rectangle:5

Area of Rectangle 1: 40

Perimeter of Rectangle 1: 26

The second rectangle has a larger area.

DATE : 27-11-2023

- 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=0):
        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 = self.balance + amount
            print("\nDeposition Successful!")
        else:
            print("\nInvalid amount!")
    def withdraw(self, amount):
        if 0 < amount < self.balance:
            self.balance = self.balance - amount
            print("Withdrawal successful")
            print("New Balance : ",self.balance)
```

```
        elif amount > self.balance:

            print("Not possible to withdraw. Insufficient funds.")

        else:

            print("Invalid amount!")

    def get_balance(self):

        return self.balance

account1 = BankAccount("123456", "Prajith", "Savings", 10000)

print("current balance:",account1.get_balance())

deposit_amount = float(input("Enter the deposit amount: "))

account1.deposit(deposit_amount)

withdrawal_amount = float(input("Enter the withdrawal amount: "))

account1.withdraw(withdrawal_amount)

account1.get_balance()
```

Output

current balance: 10000

Enter the deposit amount: 4000

Deposition Successful!

Enter the withdrawal amount: 10000

Withdrawal successful

New Balance : 4000

DATE : 27-11-2023

- 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()

print("First rectangle: ")

l=int(input("Enter the length of the rectangle:"))

b=int(input("Enter the breadth of the rectangle:"))

rectangle1 = Rectangle(l, b)

print("Second rectangle: ")

l=int(input("Enter the length of the rectangle:"))

b=int(input("Enter the breadth of the rectangle:"))
```

```
rectangle2 = Rectangle(1, b)

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

First rectangle:

Enter the length of the rectangle:5

Enter the breadth of the rectangle:6

Second rectangle:

Enter the length of the rectangle:8

Enter the breadth of the rectangle:5

Area of Rectangle 2 is larger than the area of Rectangle 1.

DATE : 29-11-2023

- 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}"

a=int(input("Enter the hour of time1:"))

b=int(input("Enter the minute of time1:"))

c=int(input("Enter the second of time1:"))
```

```
x=int(input("Enter the hour of time2:"))

y=int(input("Enter the minute of time2:"))

z=int(input("Enter the second of time2:"))

time1 = Time(a,b,c)

time2 = Time(x,y,z)

sum_time = time1 + time2

print("Time 1:", time1)

print("Time 2:", time2)

print("Sum of Time 1 and Time 2:", sum_time)
```

Output

Enter the hour of time1:2

Enter the minute of time1:30

Enter the second of time1:00

Enter the hour of time2:3

Enter the minute of time2:10

Enter the second of time2:30

Time 1: 02:30:00

Time 2: 03:10:30

Sum of Time 1 and Time 2: 05:40:30

DATE : 29-11-2023

- 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)  
    publisher=input("Enter the name of publisher:")  
    book_name=input("Enter the name of book:")  
    author=input("Enter the name of author:")  
    book_price=input("Enter the price of book:")  
    book_pages=input("Enter the number of pages of the book:")  
    python_book = Python(publisher, book_name, author, book_price, book_pages)  
    python_book.display_info()
```

Output

Enter the name of publisher:Universities Press

Enter the name of book:Wings of fire

Enter the name of author:A.P.J.Abdul Kalam

Enter the price of book:385

Enter the number of pages of the book:190

Publisher: Universities Press

Title: Wings of fire

Author: A.P.J.Abdul Kalam

Price: 385

Number of Pages: 190

