Lab No: 08 Introduction to Abstract Classes

Task 01:

Discuss in detail

- What is Abstraction in Python?
  Abstraction in Python is the process of hiding the real implementation of an application from the user and emphasizing only on usage of it.

- How can we achieve Abstraction in Python?
  Abstraction in Python is achieved by using abstract classes and interfaces. An abstract class is a class that generally provides incomplete functionality and contains one or more abstract methods.

- Mention the name of the module to be imported for an abstract class?
  'abc' is the module to be imported when we define an abstract class in Python programs. 'abc' stands for 'abstract base class'.

Task 02:

Create an ABC class of Bank and add some abstract method AccountName, rate of interest, deposit, withdraw, Now add some classes in which you will implement Bank abstract class and its methods.

Code:

```
from abc import ABC, abstractmethod


class Bank(ABC):
    @abstractmethod
    def account_name(self):
        pass
    def rate_of_interest(self):
        pass
    def deposit(self):
        pass
    def withdraw(self):
        pass
    def balance(self):
        pass


class Current_Account(Bank):
    def account_name(self):
        print("\tCurrent Account")
        print("Account Name: Bilal Yousuf")
    def rate_of_interest(self):
        print("Rate of Interest : 10%")
    def deposit(self):
        print("Deposit : 100,000")
    def withdraw(self):
        print("Withdraw : 10,000")
```

```
    def balance(self):
        print("Remaining Balance : 90,000")
        print("\n")

class Saving_Account(Bank):
    def account_name(self):
        print("\tSaving Account")
        print("Account Name: Mohammed Bilal")
    def rate_of_interest(self):
        print("Rate of Interest : 20%")
    def deposit(self):
        print("Deposit : 500,000")
    def withdraw(self):
        print("Withdraw : 50,000")
    def balance(self):
        print("Remaining Balance : 450,000")
        print("\n")

def detail(self):
    self.account_name()
    self.rate_of_interest()
    self.deposit()
    self.withdraw()
    self.balance()

c = Current_Account()
s = Saving_Account()

detail(c)
detail(s)
```

Output:

```
        Current Account
Account Name: Bilal Yousuf
Rate of Interest : 10%
Deposit : 100,000
Withdraw : 10,000
Remaining Balance : 90,000


        Saving Account
Account Name: Mohammed Bilal
Rate of Interest : 20%
Deposit : 500,000
Withdraw : 50,000
Remaining Balance : 450,000
```

Task 03:

Find out one real world example of abstract class and abstract method and implement it by using python code.

Code:

```
from abc import ABC, abstractmethod


class Villa(ABC):
    @abstractmethod
    def welcome(self):
        pass
    def location(self):
        pass
    def essential(self):
        pass
    def features(self):
        pass
    def price(self):
        pass


class Jumeirah(Villa):
    def welcome(self):
        print("\t\t\t\tWelcome to Palm Jumeirah Villa\n")
    def location(self):
        print("Location: \nCity : Dubai\nArea Palm : Jumeirah\nDevelopment : Signature Villa\nSub-development : Frond P\n")
    def essential(self):
        print("Essential: \nProperty ID : 4985\nType : Villa\nAvailability : Ready\nBedrooms : 6 bedrooms\nBuilt up area : 9,000 sq ft\nPlot size : 15,000 sq ft\n")
    def features(self):
        print("Features: \nDLD Permit : 0266498302 \nLifestyle : Beachfront \nProperties : Pool Infinity private pool \nFacing : South West \nViews : Partial Skyline, Full Sea, Atlantis &
```

```
Blue Water Island \nFinishings : Marble, wood flooring. 4 wardrobes, walk in closet and
smart home technology \nFacilities : 3 Allocated parkings, private gymnasium and private
bbq\n")

    def price(self):

        print("Price : AED 49,995,000")


v = Jumeirah()

v.welcome()

v.location()

v.essential()

v.features()

v.price()
```

Output:

```
                                Welcome to Palm Jumeirah Villa

Location:
City : Dubai
Area Palm : Jumeirah
Development : Signature Villa
Sub-development : Frond P

Essential:
Property ID : 4985
Type : Villa
Availability : Ready
Bedrooms : 6 bedrooms
Built up area : 9,000 sq ft
Plot size : 15,000 sq ft

Features:
DLD Permit : 0266498302
Lifestyle : Beachfront
Properties : Pool Infinity private pool
Facing : South West
Views : Partial Skyline, Full Sea, Atlantis & Blue Water Island
Finishings : Marble, wood flooring. 4 wardrobes, walk in closet and smart home technology
Facilities : 3 Allocated parkings, private gymnasium and private bbq

Price : AED 49,995,000
```