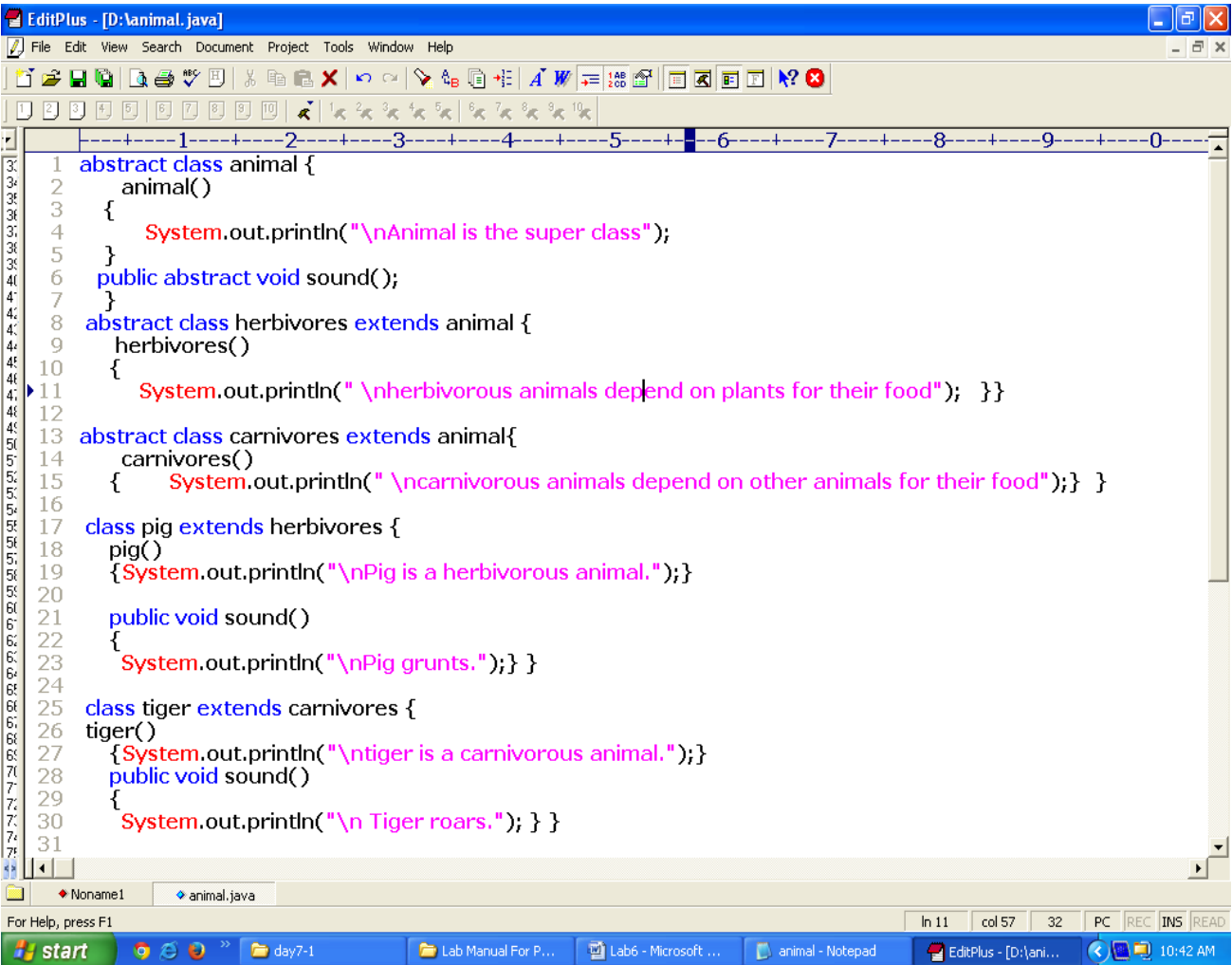


Lab-6 Assignments

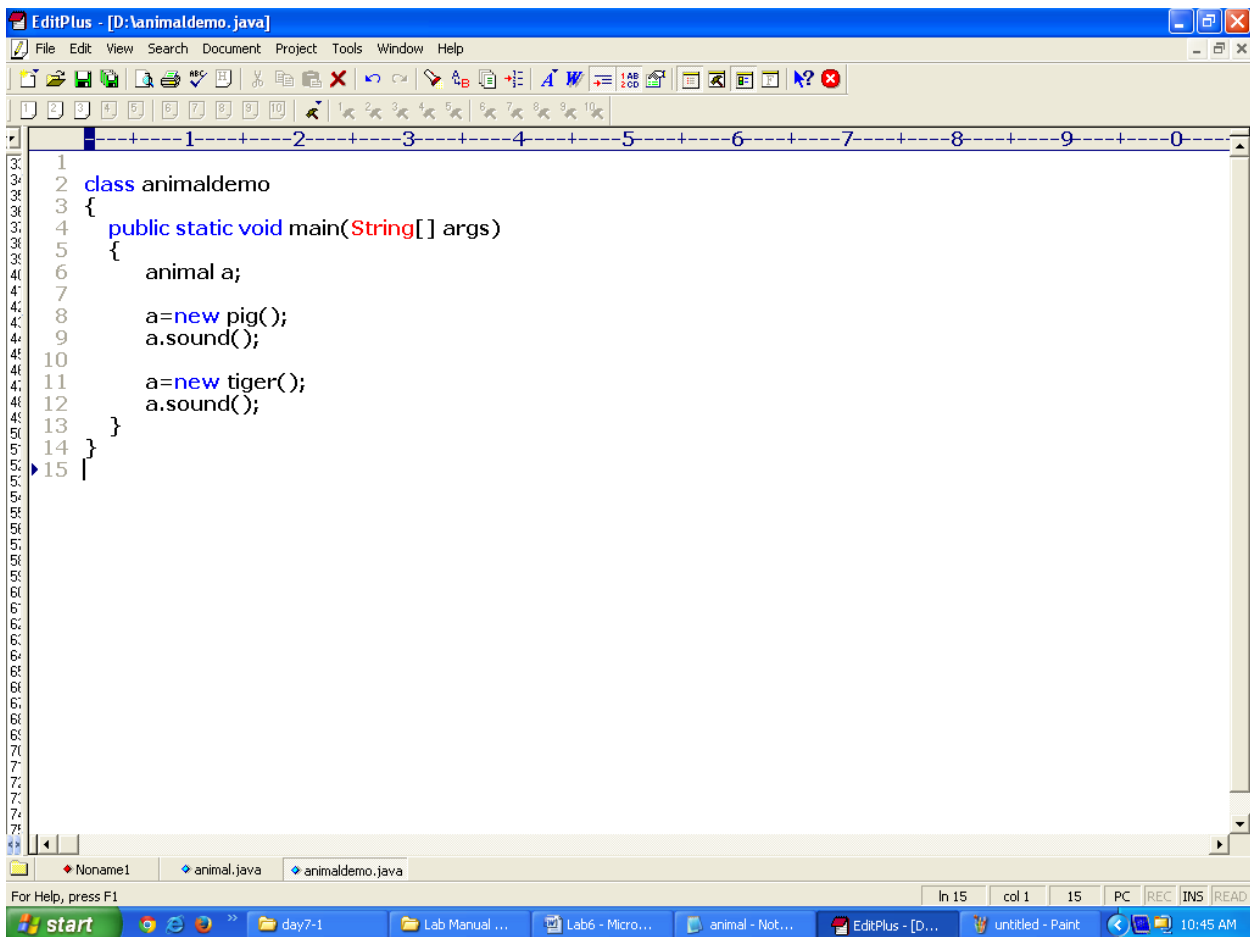
Introducing Abstract class

Demo for Abstract class



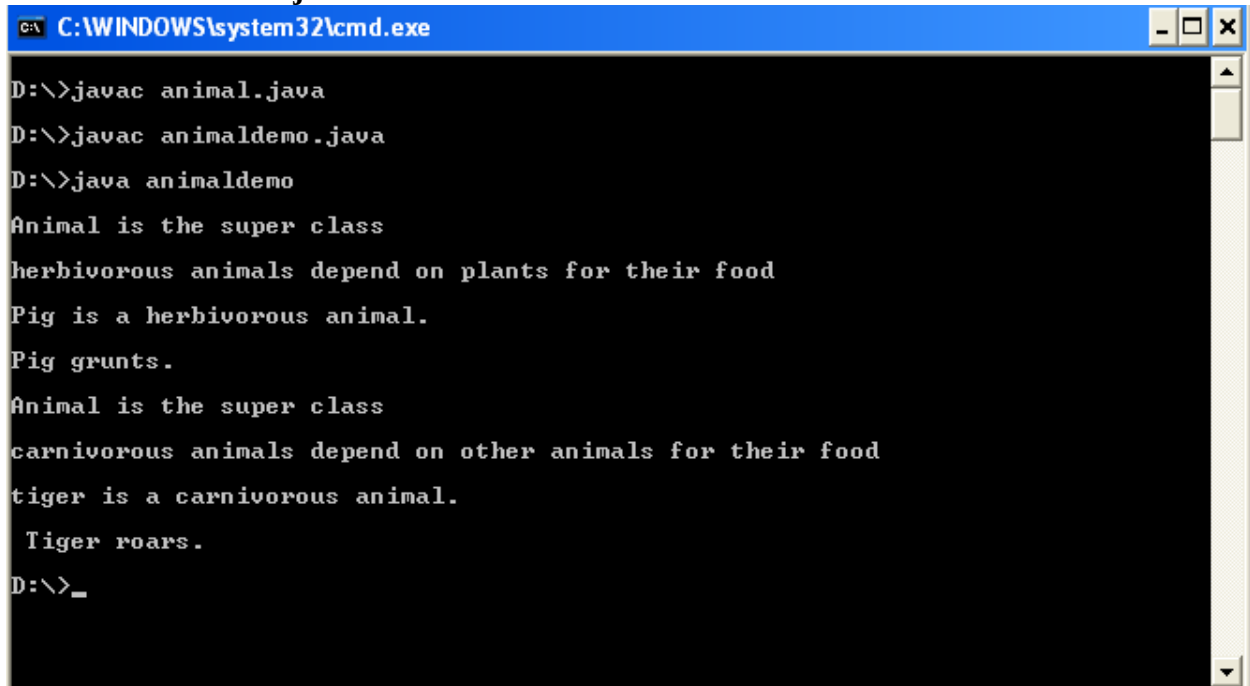
```
1 abstract class animal {
2     animal()
3     {
4         System.out.println("\nAnimal is the super class");
5     }
6     public abstract void sound();
7 }
8 abstract class herbivores extends animal {
9     herbivores()
10    {
11        System.out.println(" \nherbivorous animals depend on plants for their food"); } }
12
13 abstract class carnivores extends animal{
14     carnivores()
15     { System.out.println(" \ncarnivorous animals depend on other animals for their food");} }
16
17 class pig extends herbivores {
18     pig()
19     {System.out.println("\nPig is a herbivorous animal.");}
20
21     public void sound()
22     {
23         System.out.println("\nPig grunts.");} }
24
25 class tiger extends carnivores {
26     tiger()
27     {System.out.println("\ntiger is a carnivorous animal.");}
28     public void sound()
29     {
30         System.out.println("\n Tiger roars."); } }
31
```

Save as animal.java



```
1 class animaldemo
2 {
3     public static void main(String[] args)
4     {
5         animal a;
6
7         a=new pig();
8         a.sound();
9
10        a=new tiger();
11        a.sound();
12    }
13 }
14 }
15 }
```

Sava as animaldemo.java



```
C:\WINDOWS\system32\cmd.exe

D:\>javac animal.java
D:\>javac animaldemo.java
D:\>java animaldemo
Animal is the super class
herbivorous animals depend on plants for their food
Pig is a herbivorous animal.
Pig grunts.
Animal is the super class
carnivorous animals depend on other animals for their food
tiger is a carnivorous animal.
Tiger roars.
D:\>_
```

Assignments To Solve

1. Create an abstract class Instrument which is having the abstract function play. Create three more sub classes from Instrument which is Piano, Flute, Guitar. Override the play method inside all three classes printing a message .
“Piano is playing tan tan tan tan ” for Piano class
“Flute is playing toot toot toot toot” for Flute class
“Guitar is playing tin tin tin ” for Guitar class

You must not allow the user to declare an object of Instrument class.

Create an array of 10 Instruments.

Assign different type of instrument to Instrument reference.

Check for the polymorphic behavior of play method.

Use the instanceof operator to print that which object stored at which index of instrument array.

2. Create a class Medicine to represent a drug manufactured by a pharmaceutical company. Provide a function displayLabel() in this class to print Name and address of the company.

Derive Tablet, Syrup and Ointment classes from the Medicine class. Override the displayLabel() function in each of these classes to print additional information suitable to the type of medicine. For example, in case of tablets, it could be “store in a cool dry place”, in case of ointments it could be “for external use only” etc.

Create a class TestMedicine . Write main function to do the following:

Declare an array of Medicine references of size 10

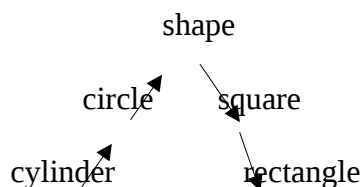
Create a medicine object of the type as decided by a randomly generated integer in the range 1 to 3.

Refer Java API Documentation to find out random generation feature.

Check the polymorphic behavior of the displayLabel() method.

3. Create an abstract class shape with abstract method void area();

create 4 more classes circle, cylinder, square and rectangle



Override the area() in all the classes

Create an array of references of type shape in TestShape class and print the area of different types of shapes.