NAME : MINAL CHHATRE
ENROLL : 1906016
G3 (A)

Program 9 Develop programs for implementation of multilevel inheritance by applying various access controls to its data members and methods.

CODE:

```
class Base{
  public int x = 1;
  protected int y = 2;
  int z=3;
  private int l=4;
  public void base_meth1(){
     System.out.println("Base_meth1 x= "+x);
      System.out.println("Base_meth1 y= "+y);
       System.out.println("Base_meth1 z= "+z);
        System.out.println("Base_meth1 l= "+l);
  }
  protected void base_meth2(){
     System.out.println("Base_meth2 x= "+x);
      System.out.println("Base_meth2 y= "+y);
       System.out.println("Base_meth2 z= "+z);
        System.out.println("Base_meth2 l= "+l);
  }
   void base_meth3(){
     System.out.println("Base_meth3 x= "+x);
      System.out.println("Base_meth3 y= "+y);
       System.out.println("Base_meth3 z= "+z);
        System.out.println("Base_meth3 l= "+l);
  }
  private void base_meth4(){
     System.out.println("Base_meth4 x= "+x);
      System.out.println("Base_meth4 y= "+y);
       System.out.println("Base_meth4 z= "+z);
        System.out.println("Base_meth4 l= "+l);
  }

}
class Derived1 extends Base{
   public int a = 5;
  protected int b = 6;
  int c=7;
  private int d=8;
  public void meth2(){
      System.out.println("Derived1 a= "+a);
       System.out.println("Derived2 b= "+b);
        System.out.println("Derived3 c= "+c);
```

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```
        System.out.println("Derived5 d= "+d);
  }

}
class Derived2 extends Derived1{
 public int p = 9;
  protected int q= 10;
  int r=11;
  private int s=12;
  public void meth3(){
      System.out.println("Derived2 p= "+p);
       System.out.println("Derived2 q= "+q);
        System.out.println("Derived2 r= "+r);
        System.out.println("Derived2 s= "+s);
  }
}
public class Multilevel_inheritance {


   public static void main(String[] args) {
      Derived2 d2 = new Derived2();
//       variables
      System.out.println("Accessing variables of base class by creating obj of Derived2
class");
      System.out.println("Base_meth1 x= "+d2.x);
      System.out.println("Base_meth1 y= "+d2.y);
       System.out.println("Base_meth1 z= "+d2.z);
//        System.out.println("Base_meth1 l= "+d2.l); not allowed becz its private
variable

//       methods
      System.out.println("Accessing methods of Base class by creating obj of Derived2
class");
      d2.base_meth1();
      d2.base_meth2();
      d2.base_meth3();
//       d2.base_meth4();  not allowed becz its private method
 System.out.println("Accessing methods of Derived1 class by creating obj of
Derived2 class");
      d2.meth2();
       System.out.println("Accessing methods of own class by creating obj of
Derived2 class");
      d2.meth3();
   }

}
```

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OUTPUT:

```
D:\java>javac Multilevel_inheritance.java
D:\java>java Multilevel_inheritance
Accessing variables of base class by creating obj of Derived2 class
Base_meth1 x= 1
Base_meth1 y= 2
Base_meth1 z= 3
Accessing methods of Base class by creating obj of Derived2 class
Base_meth1 x= 1
Base_meth1 y= 2
Base_meth1 z= 3
Base_meth1 l= 4
Base_meth2 x= 1
Base_meth2 y= 2
Base_meth2 z= 3
Base_meth2 l= 4
Base_meth3 x= 1
Base_meth3 y= 2
Base_meth3 z= 3
Base_meth3 l= 4
Accessing methods of Derived1 class by creating obj of Derived2 class
Derived1 a= 5
Derived2 b= 6
Derived3 c= 7
Derived5 d= 8
Accessing methods of own class by creating obj of Derived2 class
Derived2 p= 9
Derived2 q= 10
Derived2 r= 11
Derived2 s= 12
D:\java>
```