

PROGRAMACIÓN II

Trabajo Práctico 7: Herencia y Polimorfismo en Java

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GitHub: <https://github.com/matiaslunaa?tab=repositories>

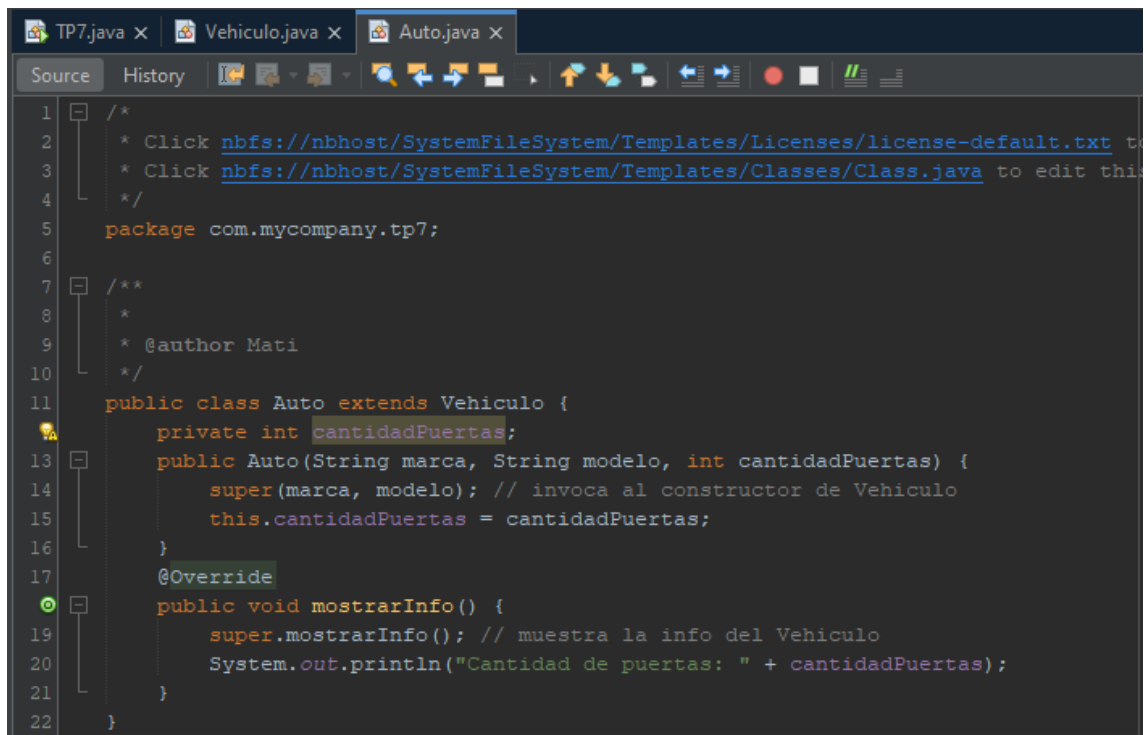
Caso Práctico

1. Vehículos y herencia básica

Clase Vehículo:

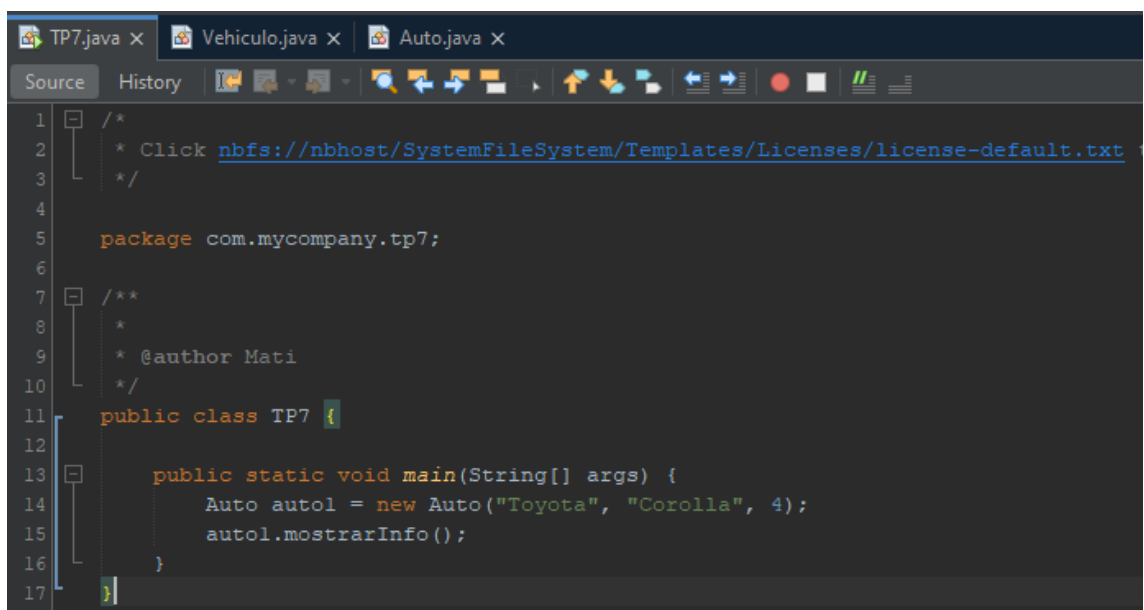
```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Vehiculo {
12       protected String marca;
13       protected String modelo;
14       public Vehiculo(String marca, String modelo) {
15           this.marca = marca;
16           this.modelo = modelo;
17       }
18       public void mostrarInfo() {
19           System.out.println("Marca: " + marca);
20           System.out.println("Modelo: " + modelo);
21       }
22   }
23
```

Clase Auto:



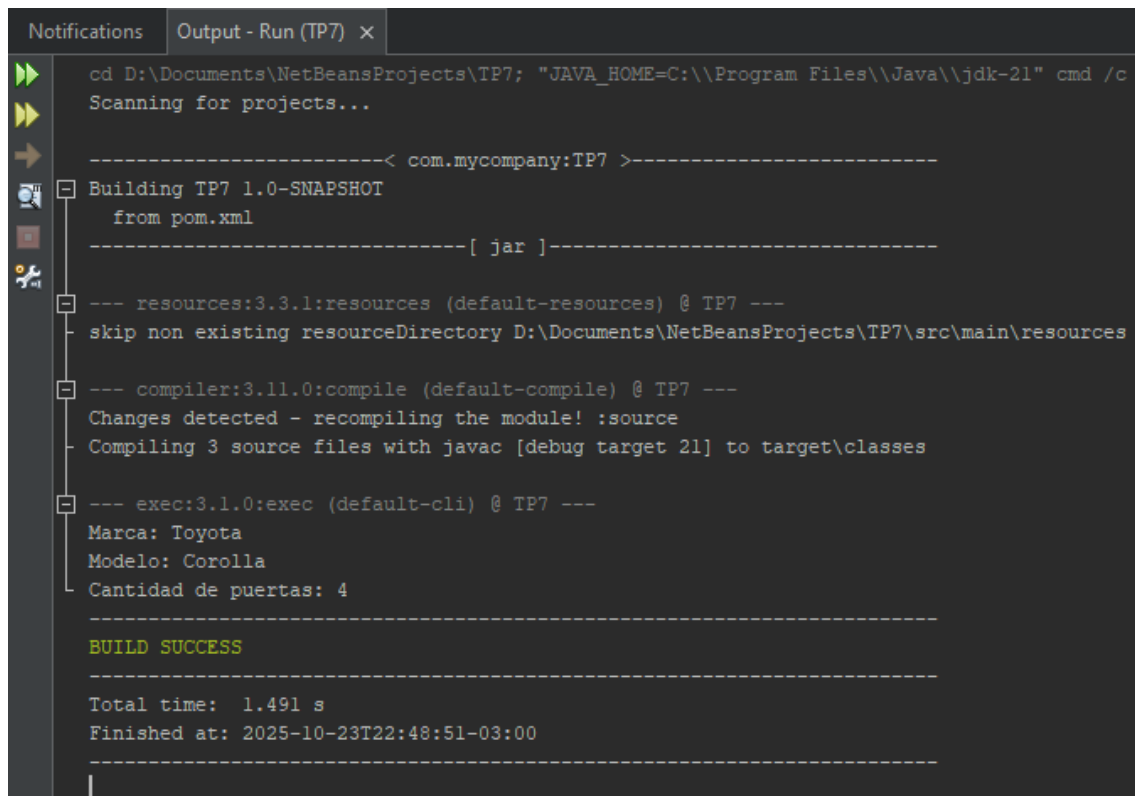
```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Auto extends Vehiculo {
12       private int cantidadPuertas;
13       public Auto(String marca, String modelo, int cantidadPuertas) {
14           super(marca, modelo); // invoca al constructor de Vehiculo
15           this.cantidadPuertas = cantidadPuertas;
16       }
17       @Override
18       public void mostrarInfo() {
19           super.mostrarInfo(); // muestra la info del Vehiculo
20           System.out.println("Cantidad de puertas: " + cantidadPuertas);
21       }
22   }
```

MAIN:



```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   */
4
5   package com.mycompany.tp7;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class TP7 {
12
13       public static void main(String[] args) {
14           Auto autol = new Auto("Toyota", "Corolla", 4);
15           autol.mostrarInfo();
16       }
17   }
```

Ejecutamos y por consola nos muestra:



```
cd D:\Documents\NetBeansProjects\TP7; "JAVA_HOME=C:\Program Files\Java\jdk-21" cmd /c
Scanning for projects...

-----< com.mycompany:TP7 >-----
Building TP7 1.0-SNAPSHOT
  from pom.xml
-----[ jar ]-----

--- resources:3.3.1:resources (default-resources) @ TP7 ---
- skip non existing resourceDirectory D:\Documents\NetBeansProjects\TP7\src\main\resources

--- compiler:3.11.0:compile (default-compile) @ TP7 ---
Changes detected - recompiling the module! :source
- Compiling 3 source files with javac [debug target 21] to target\classes

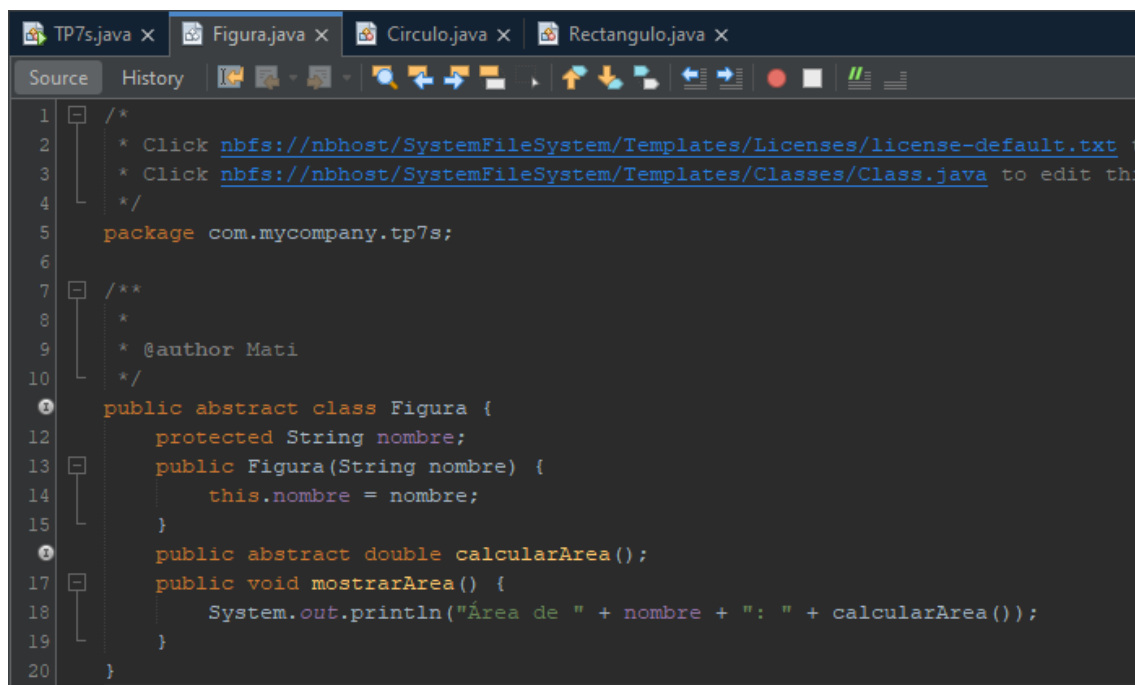
--- exec:3.1.0:exec (default-cli) @ TP7 ---
Marca: Toyota
Modelo: Corolla
Cantidad de puertas: 4

-----
BUILD SUCCESS
-----

Total time:  1.491 s
Finished at: 2025-10-23T22:48:51-03:00
-----
```

2. Figuras geométricas y métodos abstractos

Clase Figura:



```
TP7s.java x  Figura.java x  Circulo.java x  Rectangulo.java x
Source  History  [Icons]
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7s;
6
7   /**
8    *
9    * @author Mati
10   */
11   public abstract class Figura {
12       protected String nombre;
13       public Figura(String nombre) {
14           this.nombre = nombre;
15       }
16       public abstract double calcularArea();
17       public void mostrarArea() {
18           System.out.println("Área de " + nombre + ": " + calcularArea());
19       }
20   }
```

Clase Circulo:

```
TP7s.java × Figura.java × Circulo.java × Rectangulo.java ×
Source History
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7s;
6
7   /**
8    *
9    * @author Mati
10   */
11  public class Circulo extends Figura {
12      private double radio;
13      public Circulo(double radio) {
14          super("Circulo");
15          this.radio = radio;
16      }
17      @Override
18      public double calcularArea() {
19          return Math.PI * Math.pow(radio, 2);
20      }
21  }
```

Clase Rectángulo:

```
TP7s.java × Figura.java × Circulo.java × Rectangulo.java ×
Source History
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7s;
6
7   /**
8    *
9    * @author Mati
10   */
11  public class Rectangulo extends Figura {
12      private double base;
13      private double altura;
14      public Rectangulo(double base, double altura) {
15          super("Rectángulo");
16          this.base = base;
17          this.altura = altura;
18      }
19      @Override
20      public double calcularArea() {
21          return base * altura;
22      }
23  }
```

MAIN:

```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   */
4
5   package com.mycompany.tp7s;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class TP7s {
12       public static void main(String[] args) {
13           Figura[] figuras = new Figura[3];
14           figuras[0] = new Circulo(5);
15           figuras[1] = new Rectangulo(4, 6);
16           figuras[2] = new Circulo(2.5);
17
18           for (Figura f : figuras) {
19               f.mostrarArea();
20           }
21       }
22   }
```

Ejecutamos y por consola nos devuelve:

```
Notifications  Output - Run (TP7s) x
cd D:\Documents\NetBeansProjects\TP7s; "JAVA_HOME=C:\Program Files\Java\jdk-21" cmd /c
Scanning for projects...

-----< com.mycompany:TP7s >-----
Building TP7s 1.0-SNAPSHOT
  from pom.xml
-----[ jar ]-----

--- resources:3.3.1:resources (default-resources) @ TP7s ---
- skip non existing resourceDirectory D:\Documents\NetBeansProjects\TP7s\src\main\resources

--- compiler:3.11.0:compile (default-compile) @ TP7s ---
Changes detected - recompiling the module! :source
- Compiling 4 source files with javac [debug target 21] to target\classes

--- exec:3.1.0:exec (default-cli) @ TP7s ---
  area de Circulo: 78.53981633974483
  area de Rectangulo: 24.0
  area de Circulo: 19.634954084936208

BUILD SUCCESS

Total time:  1.516 s
Finished at: 2025-10-23T22:57:52-03:00
```

3. Empleados y polimorfismo

Clase Empleado

```
TP7ss.java x Empleado.java x EmpleadoPlanta.java x EmpleadoTemporal.java x
Source History
1  /**
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7ss;
6
7   /**
8    *
9    * @author Mati
10   */
11  public abstract class Empleado {
12      protected String nombre;
13      public Empleado(String nombre) {
14          this.nombre = nombre;
15      }
16      public abstract double calcularSueldo();
17      public void mostrarSueldo() {
18          System.out.println(nombre + " - Sueldo: $" + calcularSueldo());
19      }
20  }
```

Clase EmpleadoPlanta:

```
TP7ss.java x Empleado.java x EmpleadoPlanta.java x EmpleadoTemporal.java x
Source History
1  /**
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7ss;
6
7   /**
8    *
9    * @author Mati
10   */
11  public class EmpleadoPlanta extends Empleado {
12      private double sueldoBase;
13      private double antiguedad;
14      public EmpleadoPlanta(String nombre, double sueldoBase, double antiguedad) {
15          super(nombre);
16          this.sueldoBase = sueldoBase;
17          this.antiguedad = antiguedad;
18      }
19      @Override
20      public double calcularSueldo() {
21          return sueldoBase + (antiguedad * 5000);
22      }
23  }
```

Clase EmpleadoTemporal:

```
TP7ss.java x Empleado.java x EmpleadoPlanta.java x EmpleadoTemporal.java x
Source History
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to char
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this temp
4   */
5   package com.mycompany.tp7ss;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class EmpleadoTemporal extends Empleado {
12       private double pagoPorHora;
13       private int horasTrabajadas;
14       public EmpleadoTemporal(String nombre, double pagoPorHora, int horasTrabajadas) {
15           super(nombre);
16           this.pagoPorHora = pagoPorHora;
17           this.horasTrabajadas = horasTrabajadas;
18       }
19       @Override
20       public double calcularSueldo() {
21           return pagoPorHora * horasTrabajadas;
22       }
23   }
```

MAIN:

```
TP7ss.java x Empleado.java x EmpleadoPlanta.java x EmpleadoTemporal.java x
Source History
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   */
4
5   package com.mycompany.tp7ss;
6   import java.util.ArrayList;
7   /**
8    *
9    * @author Mati
10   */
11   public class TP7ss {
12       public static void main(String[] args) {
13           ArrayList<Empleado> empleados = new ArrayList<>();
14           empleados.add(new EmpleadoPlanta("Laura", 150000, 5));
15           empleados.add(new EmpleadoTemporal("Mati", 2000, 80));
16           empleados.add(new EmpleadoPlanta("Edu", 180000, 2));
17           empleados.add(new EmpleadoTemporal("Fer", 2500, 60));
18           for (Empleado e : empleados) {
19               e.mostrarSueldo();
20               if (e instanceof EmpleadoPlanta) {
21                   System.out.println("Tipo: Empleado de Planta\n");
22               } else if (e instanceof EmpleadoTemporal) {
23                   System.out.println("Tipo: Empleado Temporal\n");
24               }
25           }
26       }
27   }
```

Ejecutamos y por consola nos devuelve:

```
Notifications | Output - Run (TP7ss) x
cd D:\Documents\NetBeansProjects\TP7ss; "JAVA_HOME=C:\\Program Files\\Java\\jdk-21" cmd /c "
Scanning for projects...

-----< com.mycompany:TP7ss >-----
Building TP7ss 1.0-SNAPSHOT
  from pom.xml
-----[ jar ]-----

--- resources:3.3.1:resources (default-resources) @ TP7ss ---
skip non existing resourceDirectory D:\Documents\NetBeansProjects\TP7ss\src\main\resources

--- compiler:3.11.0:compile (default-compile) @ TP7ss ---
Changes detected - recompiling the module! :source
Compiling 4 source files with javac [debug target 21] to target\classes

--- exec:3.1.0:exec (default-cli) @ TP7ss ---
Laura - Sueldo: $175000.0
Tipo: Empleado de Planta

Mati - Sueldo: $160000.0
Tipo: Empleado Temporal

Edu - Sueldo: $190000.0
Tipo: Empleado de Planta

Fer - Sueldo: $150000.0
Tipo: Empleado Temporal

-----
BUILD SUCCESS
-----

Total time:  1.541 s
Finished at: 2025-10-23T23:43:16-03:00
-----
```

4. Animales y comportamiento sobrescrito

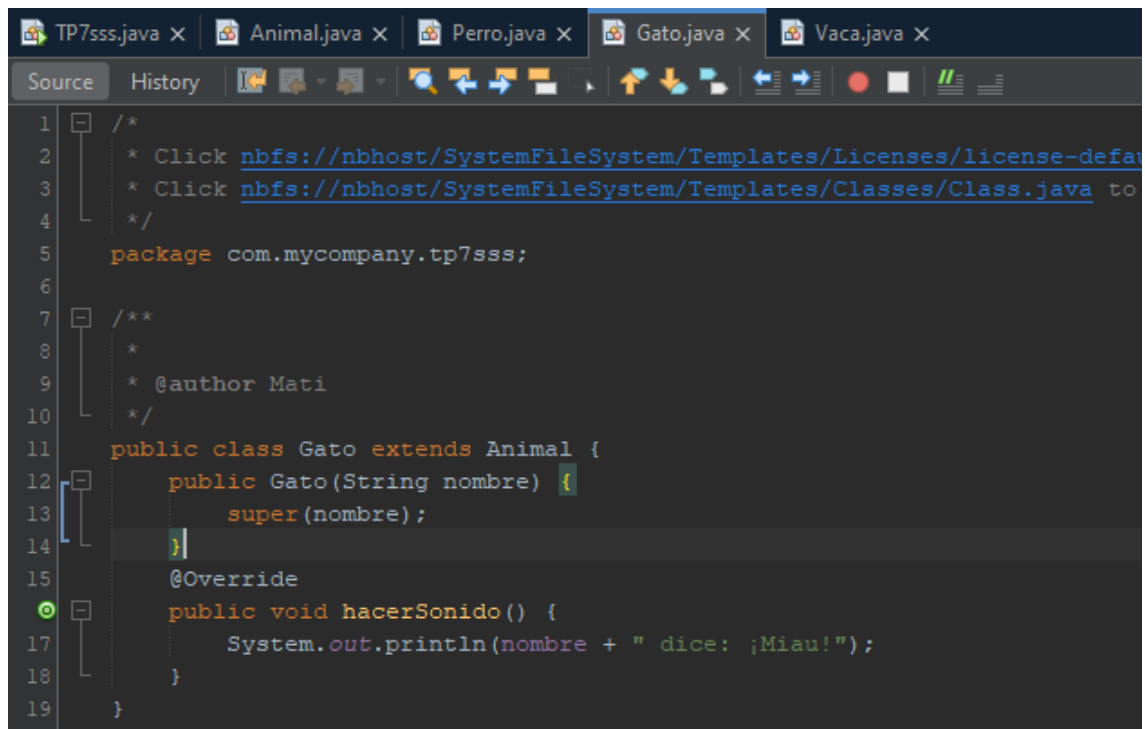
Clase Animal:


```
1  /*
2   * Click nbfs:///nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs:///nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7sss;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Animal {
12       protected String nombre;
13       public Animal(String nombre) {
14           this.nombre = nombre;
15       }
16       public void hacerSonido() {
17           System.out.println("El animal hace un sonido.");
18       }
19       public void describirAnimal() {
20           System.out.println("Soy un animal llamado " + nombre);
21       }
22   }
```

Clase Perro:

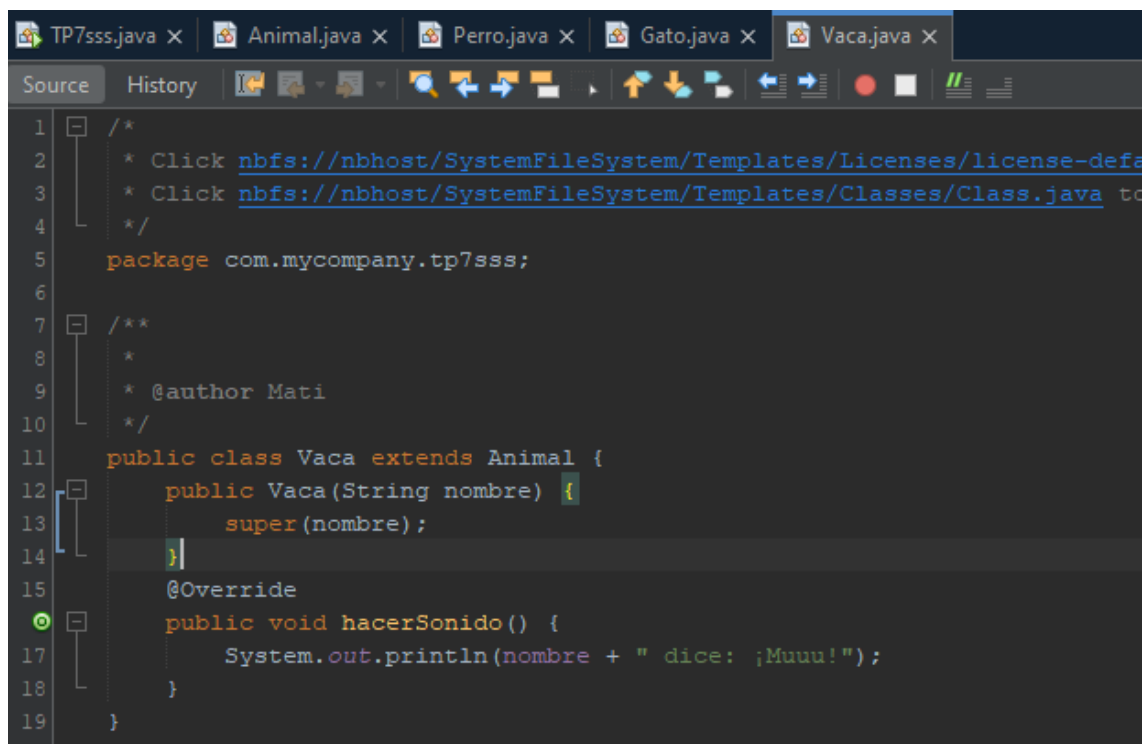
```
1  /*
2   * Click nbfs:///nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to
3   * Click nbfs:///nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this
4   */
5   package com.mycompany.tp7sss;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Perro extends Animal {
12       public Perro(String nombre) {
13           super(nombre);
14       }
15       @Override
16       public void hacerSonido() {
17           System.out.println(nombre + " dice: ¡Guau guau!");
18       }
19   }
```

Clase Gato:



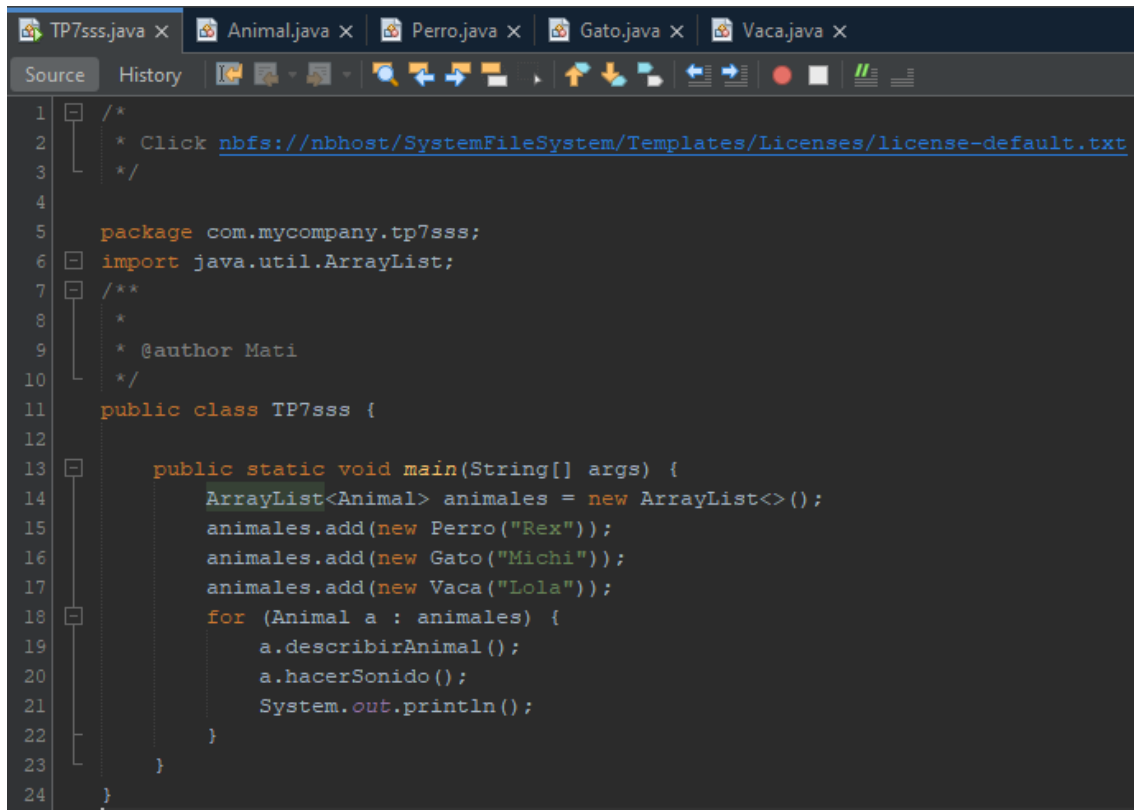
```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to view the code
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to create a new class
4   */
5   package com.mycompany.tp7sss;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Gato extends Animal {
12       public Gato(String nombre) {
13           super(nombre);
14       }
15       @Override
16       public void hacerSonido() {
17           System.out.println(nombre + " dice: ¡Miau!");
18       }
19   }
```

Clase Vaca:



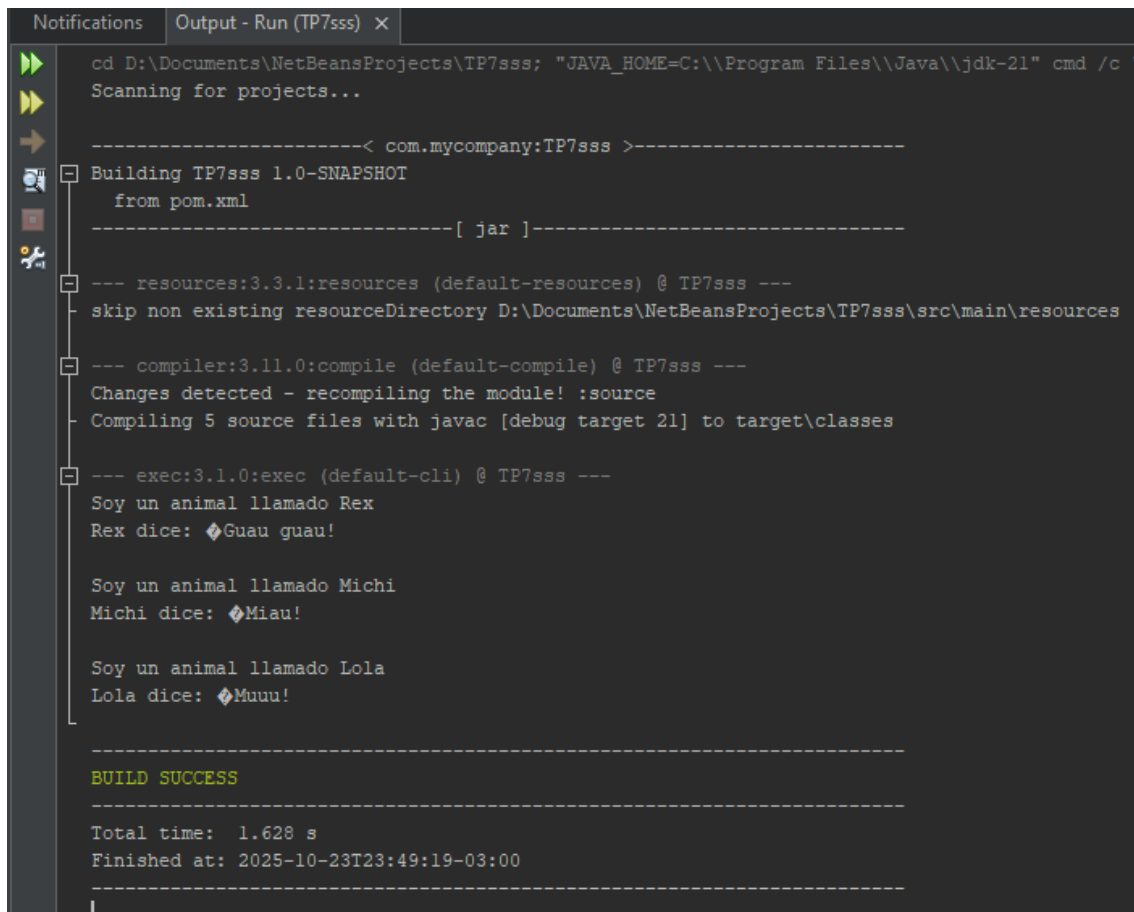
```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to view the code
3   * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to create a new class
4   */
5   package com.mycompany.tp7sss;
6
7   /**
8    *
9    * @author Mati
10   */
11   public class Vaca extends Animal {
12       public Vaca(String nombre) {
13           super(nombre);
14       }
15       @Override
16       public void hacerSonido() {
17           System.out.println(nombre + " dice: ¡Muuu!");
18       }
19   }
```

MAIN:



```
1  /*
2   * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt
3   */
4
5   package com.mycompany.tp7sss;
6   import java.util.ArrayList;
7   /**
8    *
9    * @author Mati
10   */
11   public class TP7sss {
12
13       public static void main(String[] args) {
14           ArrayList<Animal> animales = new ArrayList<>();
15           animales.add(new Perro("Rex"));
16           animales.add(new Gato("Michi"));
17           animales.add(new Vaca("Lola"));
18           for (Animal a : animales) {
19               a.describirAnimal();
20               a.hacerSonido();
21               System.out.println();
22           }
23       }
24   }
```

Ejecutamos y por consola nos devuelve:



```
cd D:\Documents\NetBeansProjects\TP7sss; "JAVA_HOME=C:\Program Files\Java\jdk-21" cmd /c "
Scanning for projects...

-----< com.mycompany:TP7sss >-----
Building TP7sss 1.0-SNAPSHOT
  from pom.xml
-----[ jar ]-----

--- resources:3.3.1:resources (default-resources) @ TP7sss ---
skip non existing resourceDirectory D:\Documents\NetBeansProjects\TP7sss\src\main\resources

--- compiler:3.11.0:compile (default-compile) @ TP7sss ---
Changes detected - recompiling the module! :source
Compiling 5 source files with javac [debug target 21] to target\classes

--- exec:3.1.0:exec (default-cli) @ TP7sss ---
Soy un animal llamado Rex
Rex dice: 🐾Guau guau!

Soy un animal llamado Michi
Michi dice: 🐾Miau!

Soy un animal llamado Lola
Lola dice: 🐾Muuu!

-----
BUILD SUCCESS
-----

Total time:  1.628 s
Finished at: 2025-10-23T23:49:19-03:00
-----
```