Programmazione ad Oggetti

Classi Composte

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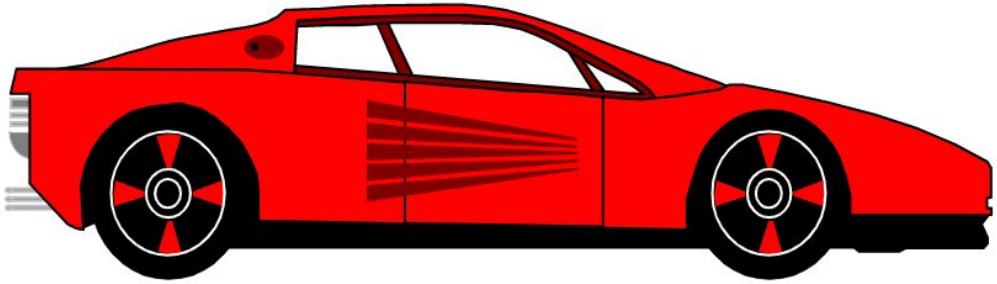
Docente: Prof. Salvatore D'Angelo
Email: salvatore.dangelo@unicampania.it

Università degli Studi della Campania *Luigi Vanvitelli*
Dipartimento di Ingegneria

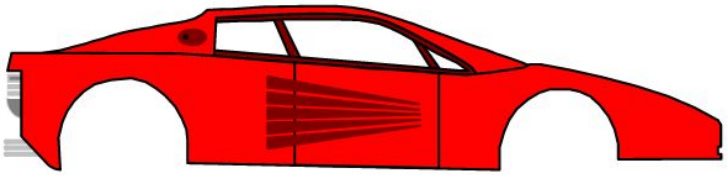
Classi Composte

Una classe essere costituita da altri oggetti



automobile

ruota

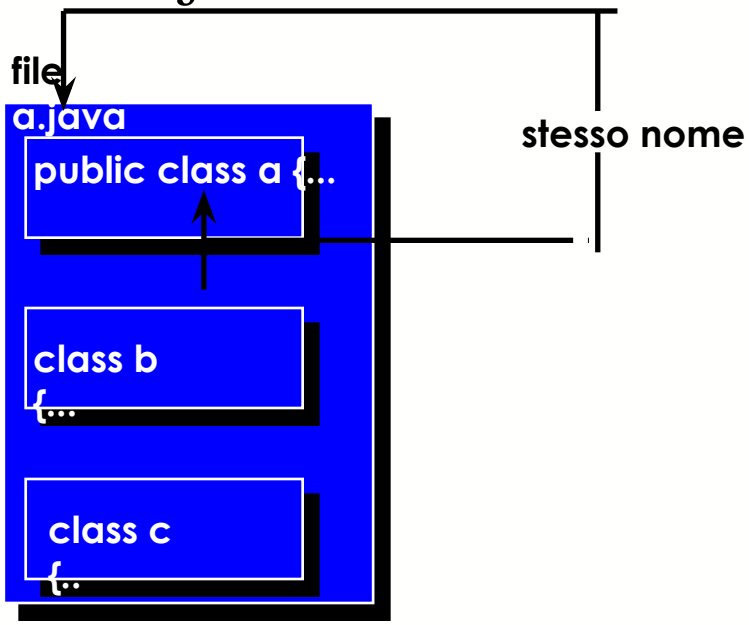


carrozzeria

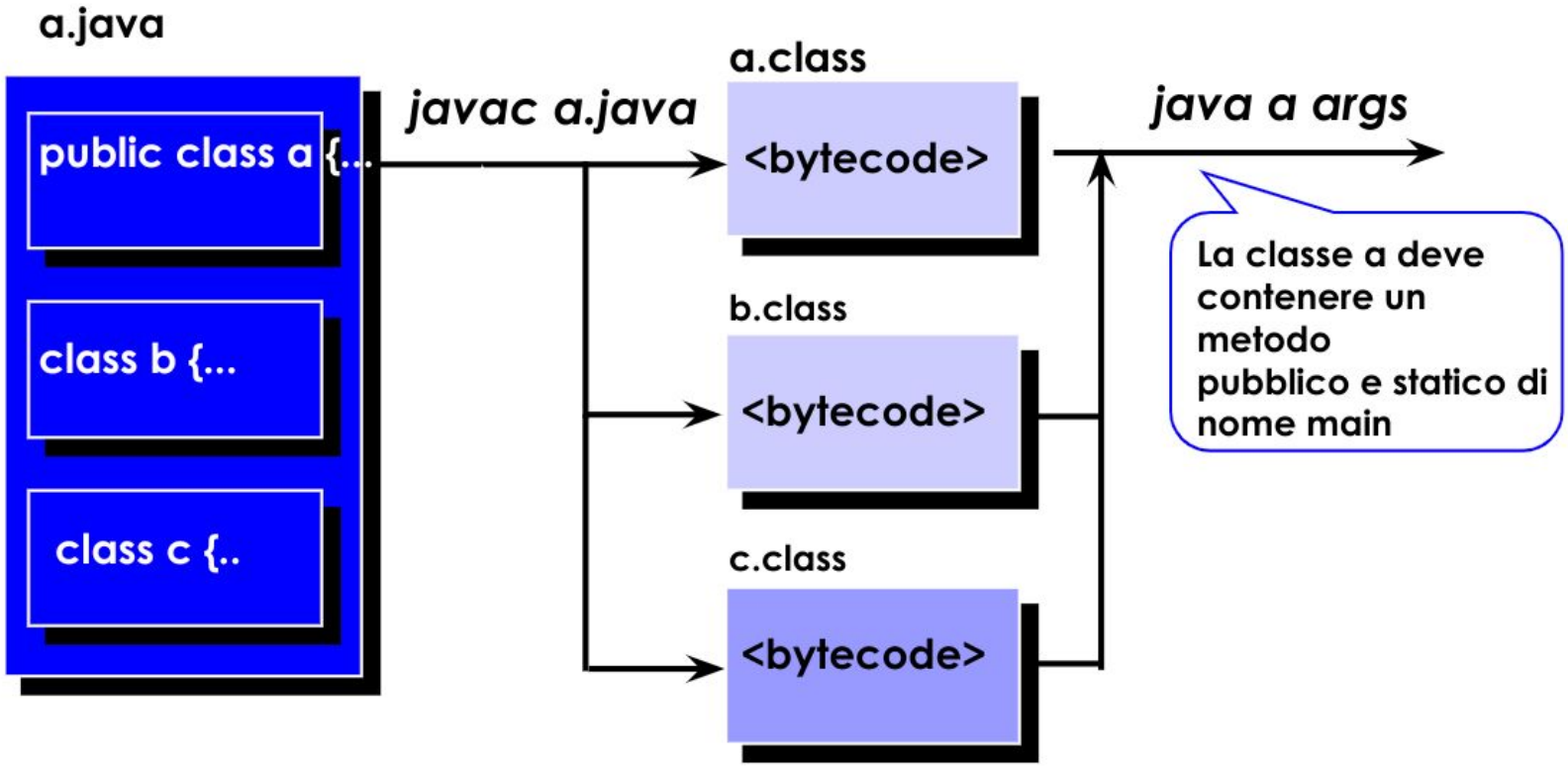
motore

Struttura di una applicazione

- Il sorgente di un'applicazione consiste di uno o più file ("unità di compilazione")
- Ogni file contiene una o più dichiarazioni di classi (o di interfacce), di cui al più una dichiarata **public**
- Il nome del file deve essere uguale a quello della sua classe **public** , con estensione .java:



Compilazione ed Esecuzione



Unita' Di Compilazione

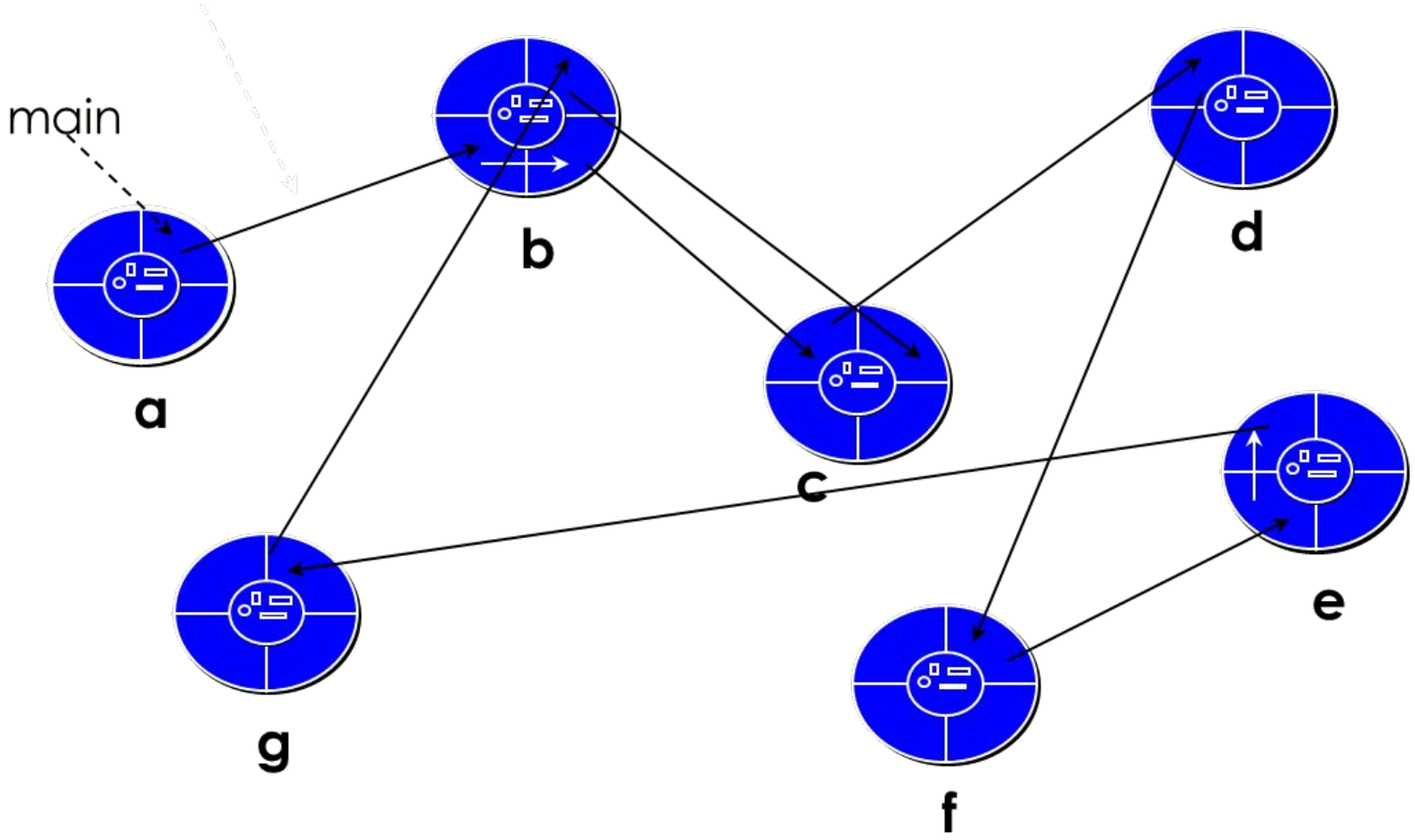
a.java

```
public class a {
      public static void main (String args
[]){
       ---
}

class OtherClass {    /* opzionale */
   …
}
```

Esempio: Applicazione con 2 classi

```
public class Test
{
  public static void main(String args[]) {
   Auto myCar;
   myCar=new Auto();
   myCar.setSpeed(10);
   System.out.println("speed="+myCar.getSpeed());
   System.out.println("Cilindri"+myCar.getCilindri());
  }
}

class Auto{
        int  cilindri=4;
        int  speed=0;
        public int getSpeed(){return speed;};
        public void setSpeed(int s){speed= s;};
        public int getCilindri(){return cilindri;};
}
```

STRUTTURA DI UN'APPLICAZIONE



Dichiarazione di oggetti

File Shirt.java

```
public class Shirt {

  public int shirtID = 0;
  public String description = "description required -";
  public char colorCode = 'U';
  public double price = 0.0;

  public int quantityInStock = 0;

    public void displayShirtInformation() {

    System.out.println("Shirt ID: " + shirtID);
    System.out.println("Shirt description:" + description);
    System.out.println("Color Code: " + colorCode);
    System.out.println("Shirt price: " + price);
    System.out.println("Quantity in stock: " + quantityInStock);
  }
}
```

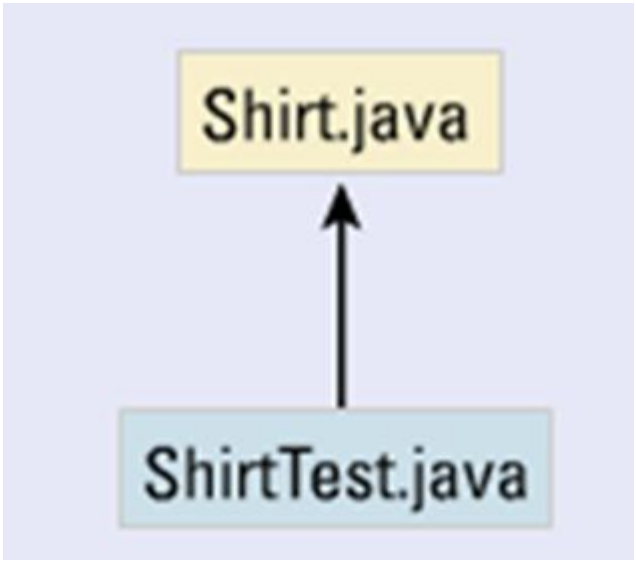
Dichiarazione di oggetti

File ShirtTest.java

```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';



    }
}
```

Compilazione

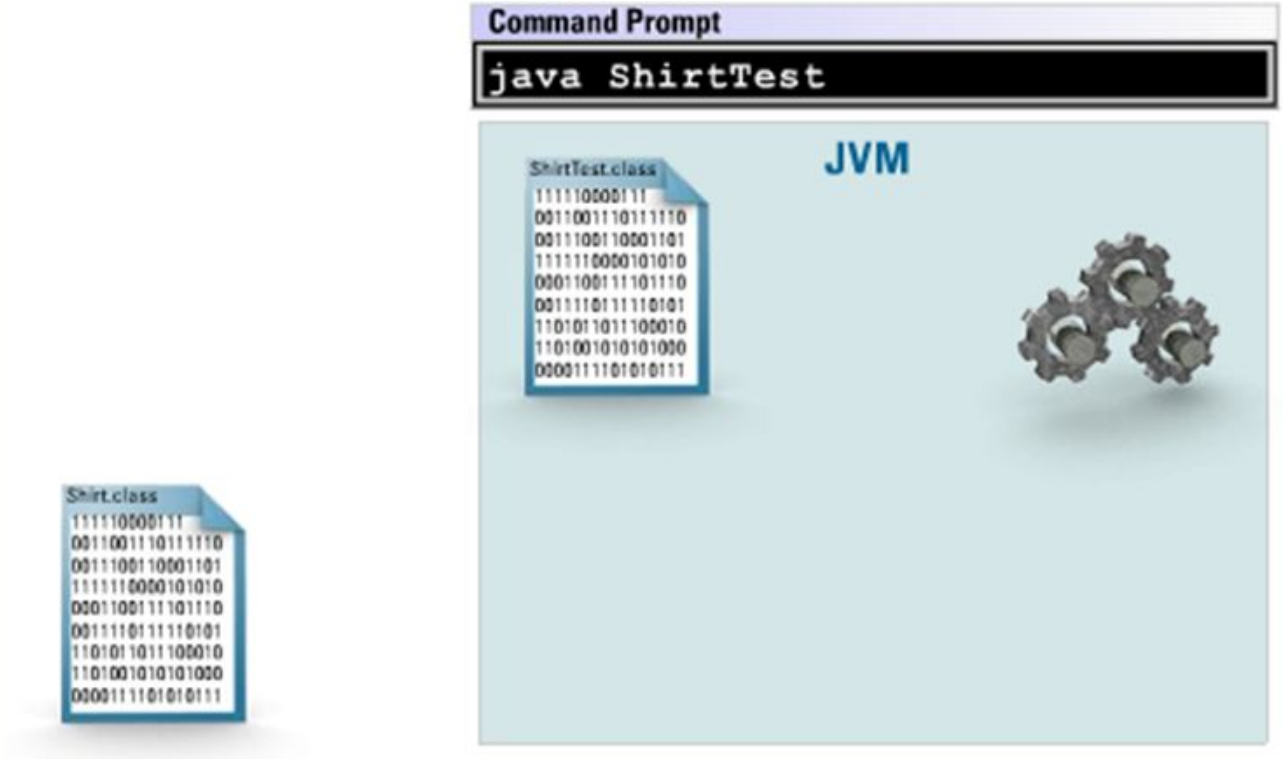
Le classi devono essere compilate in base all'ordine di dipendenza.
La classe che dipende dalle altre va compilata per ultima.



Allocazione in memoria dei file .class

Esecuzione

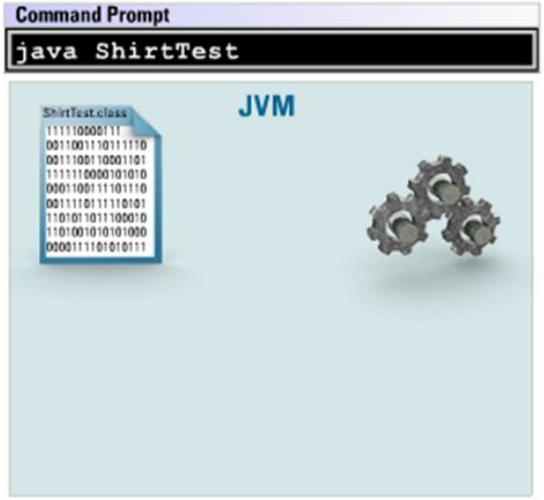
1) Esecuzione dell'applicazione ShirtTest
2) Viene caricata la classe ShirtTest in memoria



Esecuzione

3) Esecuzione della classe ShirtTest

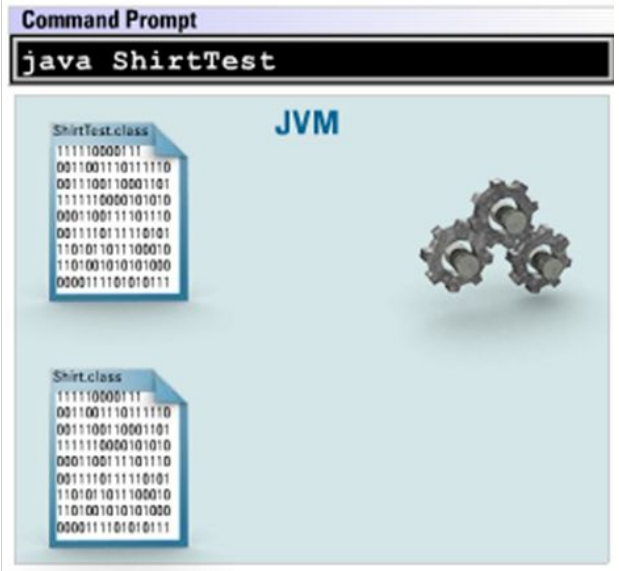
```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



Esecuzione

4) Viene caricata la classe Shirt in memoria

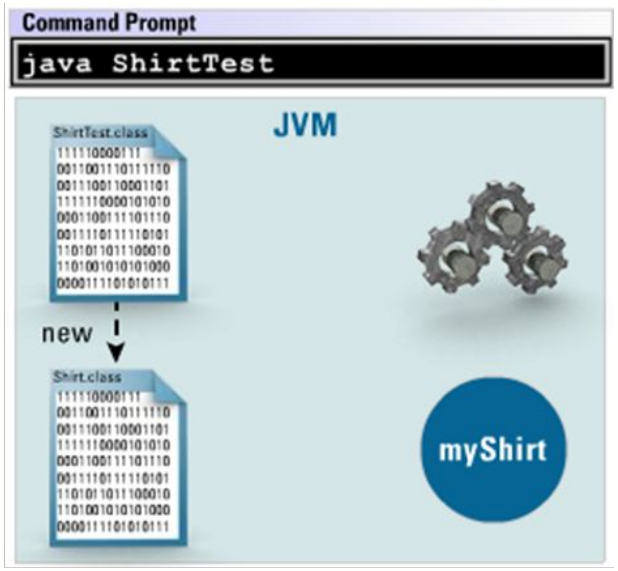
```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



Esecuzione

5) Creazione di un oggetto Shirt

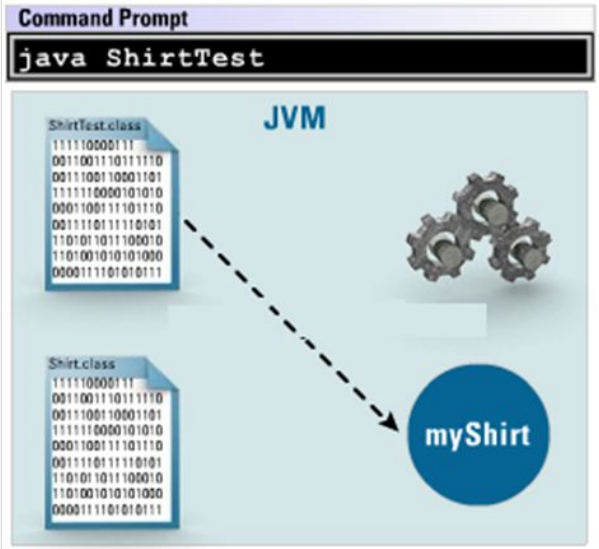
```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



Esecuzione

6) Invocare oggetto Shirt per cambiarne il valore dell'attributo colorCode

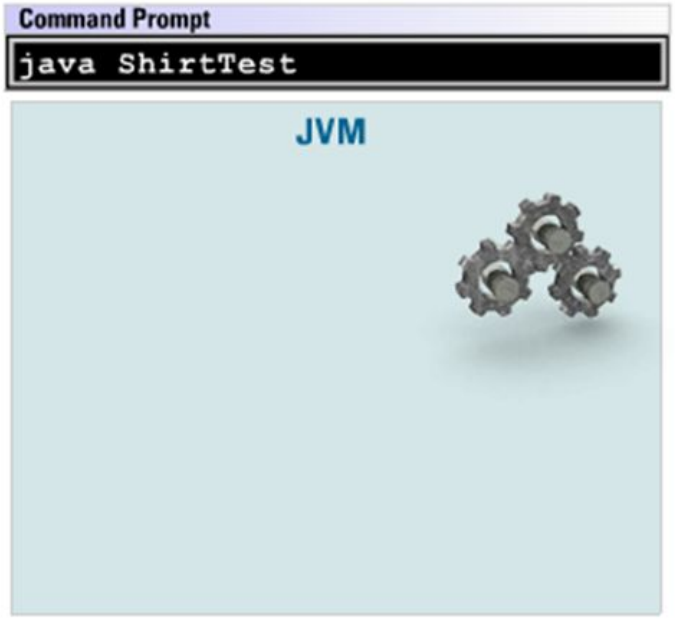
```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



Esecuzione

7) Fine dell'applicazione

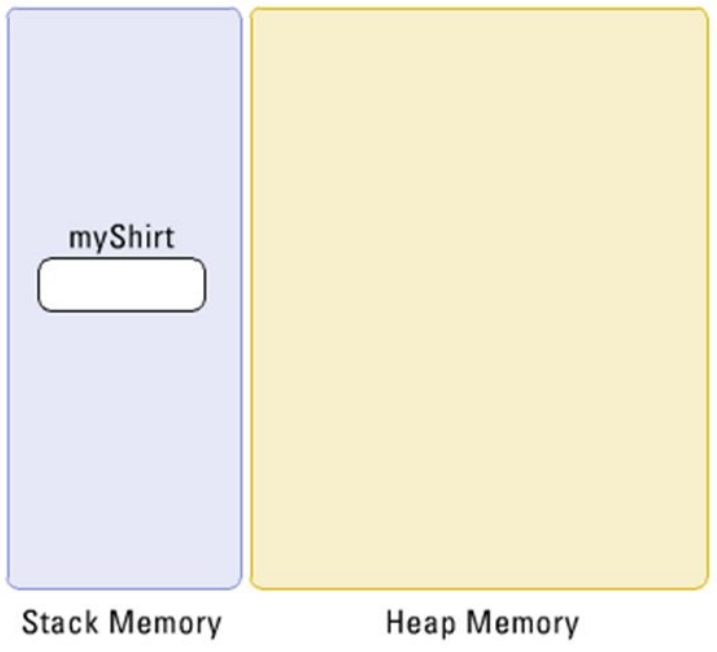
```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



Stack e Heap Memory

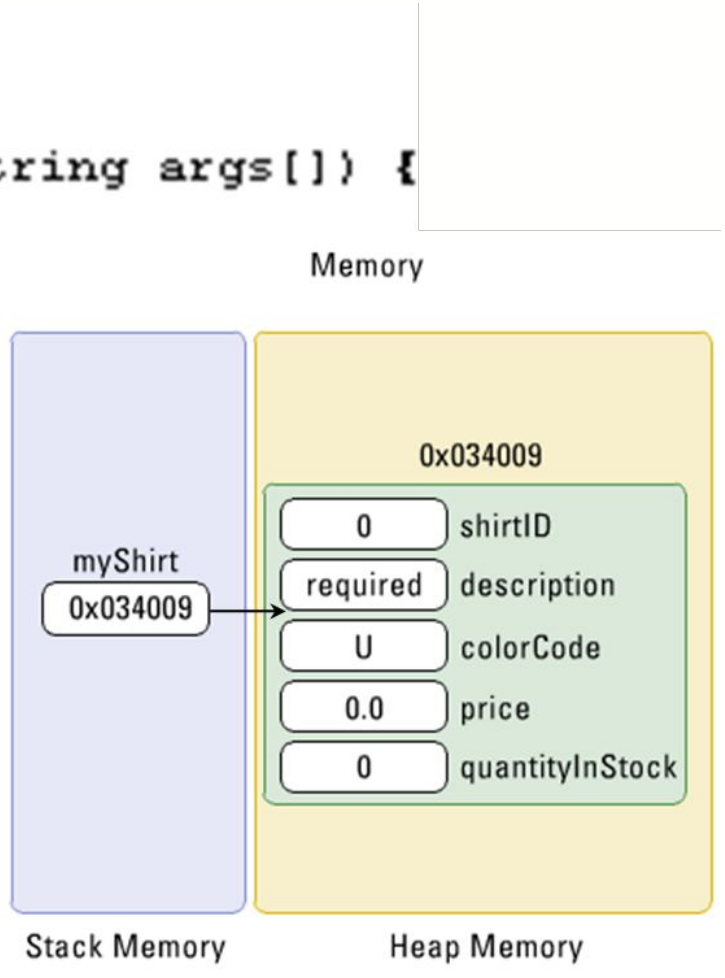
Allocazione in memoria

```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';



    }
}
```



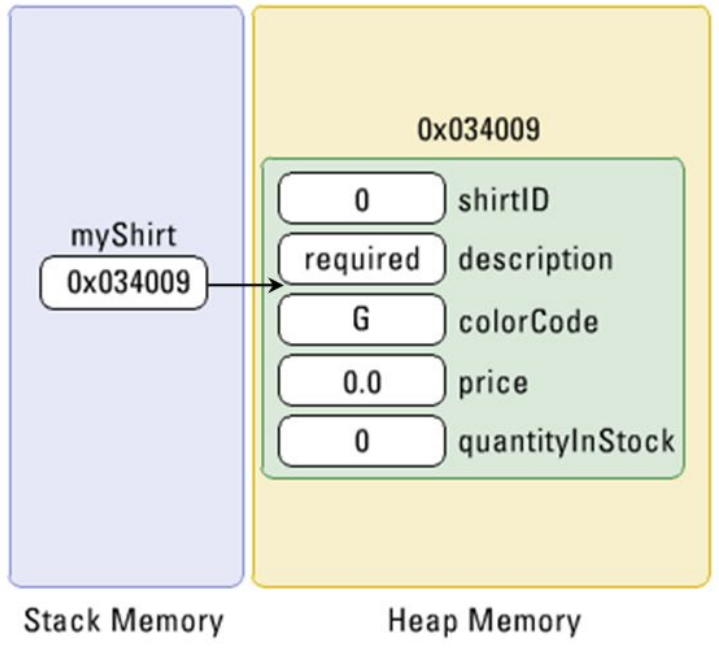
Allocazione in memoria

```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



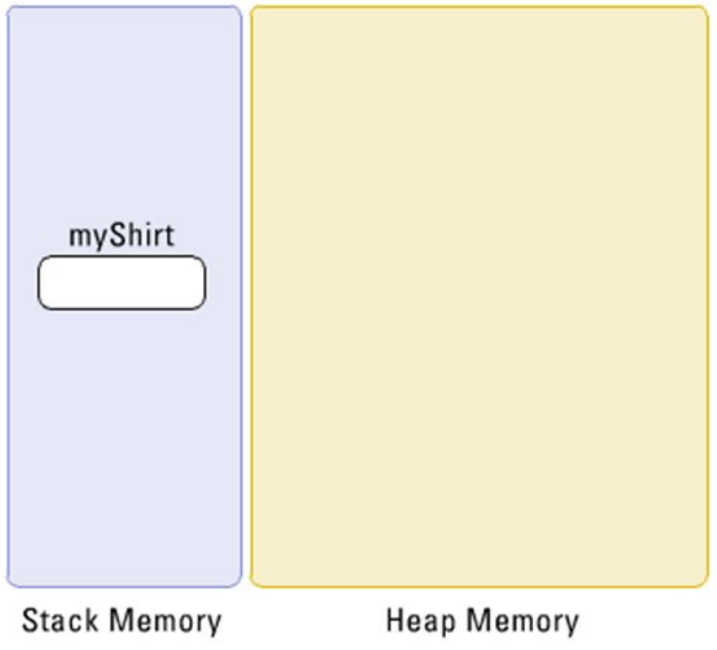
Allocazione in memoria

```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



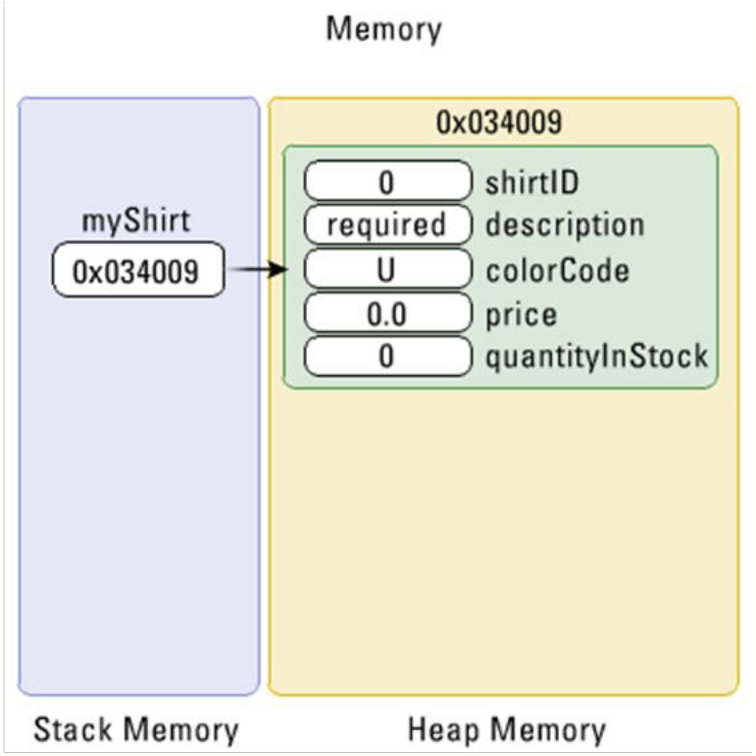
Allocazione in memoria

```
public class ShirtTest {

    public static void main (String args[]) {

    Shirt myShirt;
    myShirt = new Shirt();

    myShirt.colorCode = 'G';


    }
}
```



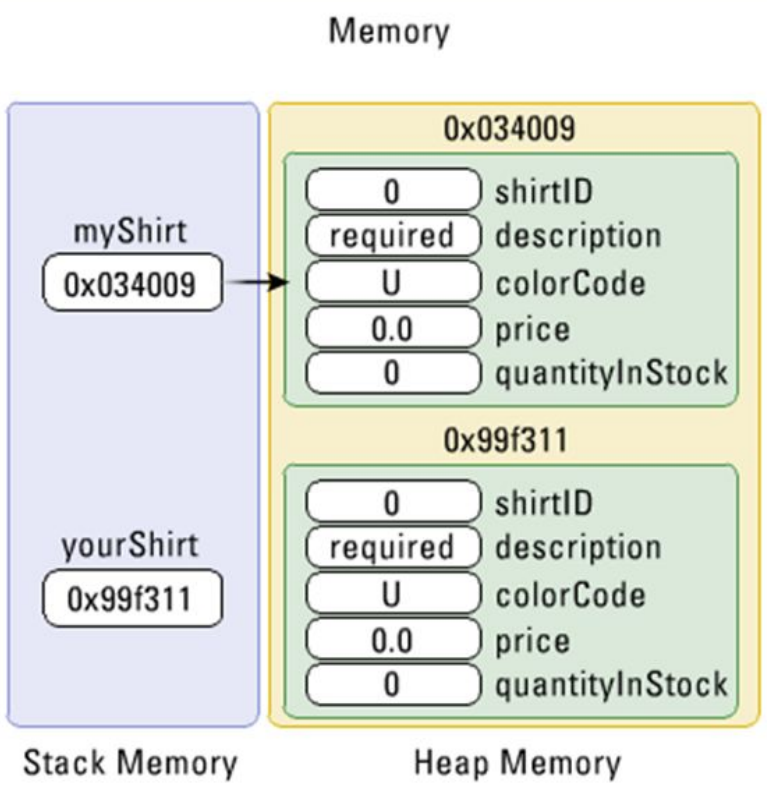
Istanziare oggetti

```
public class ShirtTestTwo {
    public static void main (String args[]) {
    Shirt myShirt = new Shirt();
    Shirt yourShirt = new Shirt();
    myShirt.displayShirtInformation();
    yourShirt.displayShirtInformation();
    myShirt.colorCode = 'R';
    yourShirt.colorCode = 'G';
    myShirt.displayShirtInformation();
    yourShirt.displayShirtInformation();
    }
}
```



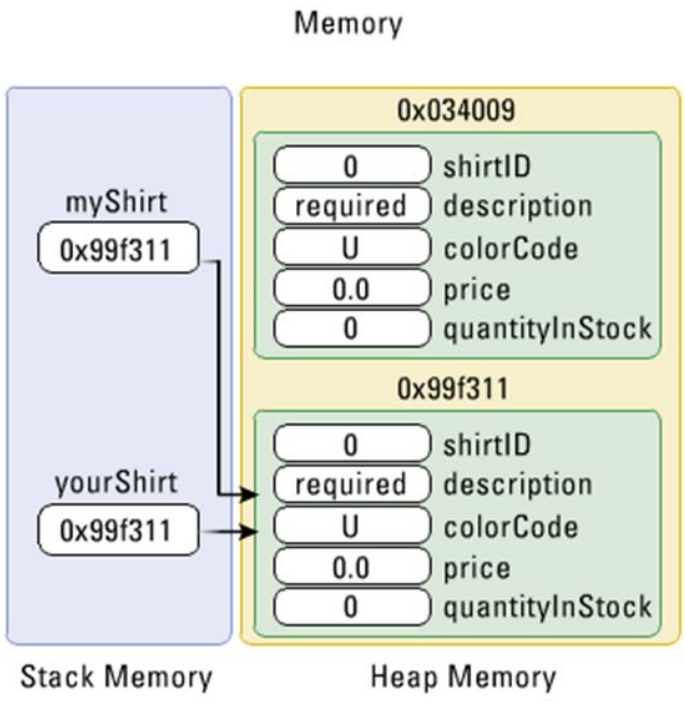
Istanziare oggetti

```
public class ShirtTestTwo {
    public static void main (String args[]) {
    Shirt myShirt = new Shirt();
    Shirt yourShirt = new Shirt();
    myShirt.displayShirtInformation();
    yourShirt.displayShirtInformation();
    myShirt.colorCode = 'R';
    yourShirt.colorCode = 'G';
    myShirt.displayShirtInformation();
    yourShirt.displayShirtInformation();
    }
}
```



Istanziare oggetti

```
public class ShirtTestTwo {
  public static void main (String args[]) {
   Shirt myShirt = new Shirt();
   Shirt yourShirt = new Shirt();
   myShirt = yourShirt;
   myShirt.colorCode = 'R';
   yourShirt.colorCode = 'G';
   }
}
```



Istanziare oggetti

```
public class ShirtTestTwo {
  public static void main (String args[]) {
   Shirt myShirt = new Shirt();
   Shirt yourShirt = new Shirt();
   myShirt = yourShirt;
   myShirt.colorCode = 'R';
   yourShirt.colorCode = 'G';
   }
}
```