

1 Inheritance

Inheritance is used to create hierarchy of classes

1.1 Example

```
class Base{  
}  
  
public class Klasa extends Base{  
}
```

Derived class have all methods and fields from its superclass. In java it is possible to inherit only from one class.

2 Casting

Objects may be cast to its base classes (in a safe way) or to its derived classes (unsafe).

2.1 Upper casting

```
Klasa k = new Klasa();  
Bazowa b = k;
```

2.2 Lower casting

```
Klasa k1 = (Klasa)k;
```

Have to define to which class

3 Instanceof

instanceof operator lets to determine if the object can be cast to appropriate class.

```
if (k1 instanceof Klasa)  
    System.out.println("inna is a Klasa");
```

4 this i super

this points to actual object

super points to base class object

5 Zadania do wykonania

1. Create the class structure for animals (minimum 3 levels)
2. Use methods and fields from base class
3. Create fields and methods with the same names as in base class
4. Create static fields and methods with the same names as in base class
5. Test casting between different objects
6. Try to inherit from final class
7. Use *instanceof* on different objects
8. Invoke constructors (with parameters and without) in derived classes
9. Try to access objects with different visibility accessors (private, public, protected) in derived classes
10. What will happen if there is no `super()` in derived constructor (with arguments and without)
11. Which class is inherited if there is not used `extends` explicitly