Java EE™

Advanced Java

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Reflection

var → sizeof () → size of var in bytes (C)

→ typeid () → type of var (C++)

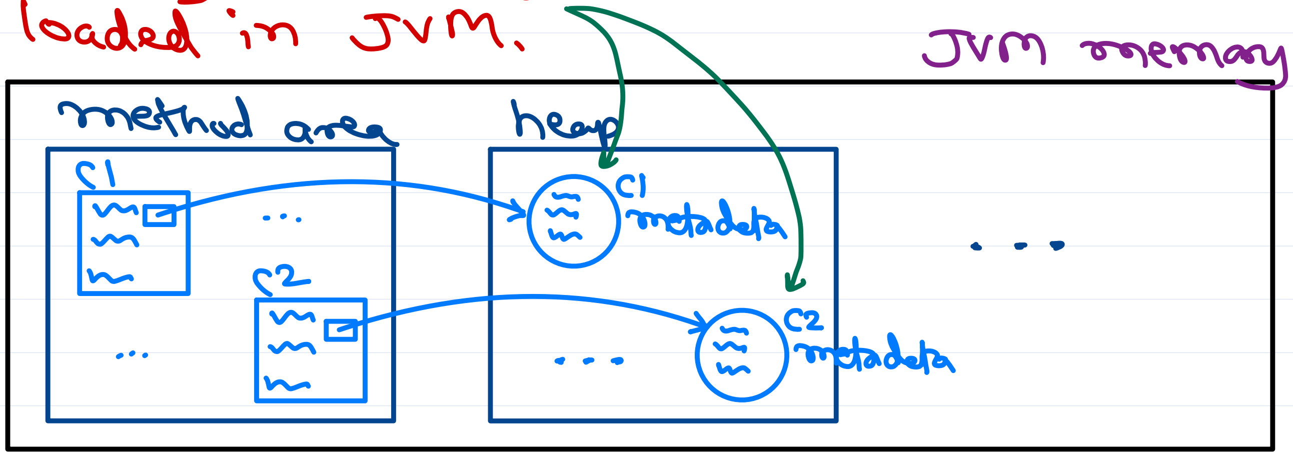
→ java.lang.Class object → full info about type of obj (Java)

metadata of the class

- name of class
- super class and super interfaces.
- fields in the class
- constructors in the class
- methods in the class
  - args & return values of method.
- access specifiers for class & members
- annotations.

Reflection

java.lang.Class object created for each class loaded in JVM.



To obtain java.lang.Class obj (metadata) associated with any class, use one of the following method.

① Class c = Class.forName("pkg.ClassName");

② Class c = ClassName.class;

③ Class c = obj.getClass();

Reflection

applications of reflection:

① get info about class metadata.

- create tools like javap.
- create intellisense kind of feature.

② dynamic invocation of methods.

- to create objs dynamically, find the method in class and call it.
- internally used by spring & hibernate.

Annotations

* used to associate additional metadata with class or its members.

* added in Java 5.0.

* imp annotations:

① @Override: check if subclass method is compatible with super class method for overriding it. If not compatible (e.g. diff signature, wrong access modifier, or wrong exception list), then java compiler raise error.

② @FunctionalInterface: check if interface contains SAM. If not, then raise compiler error.

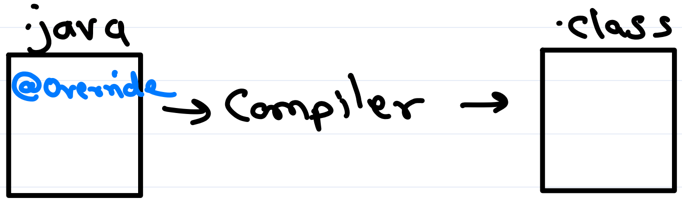
③ @SuppressWarning("—")

- rawtypes
- unchecked
- unused

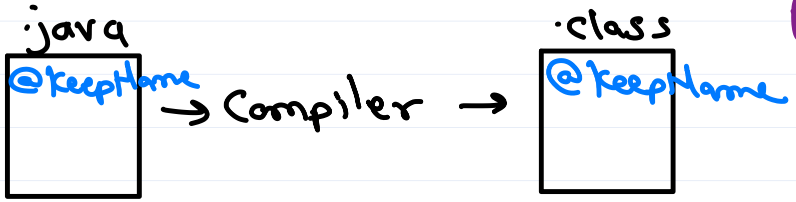
informs compiler not to raise warnings in some scenarios.

④ @Deprecated : marks a class or its member as deprecated. Using it will cause warning at compile time

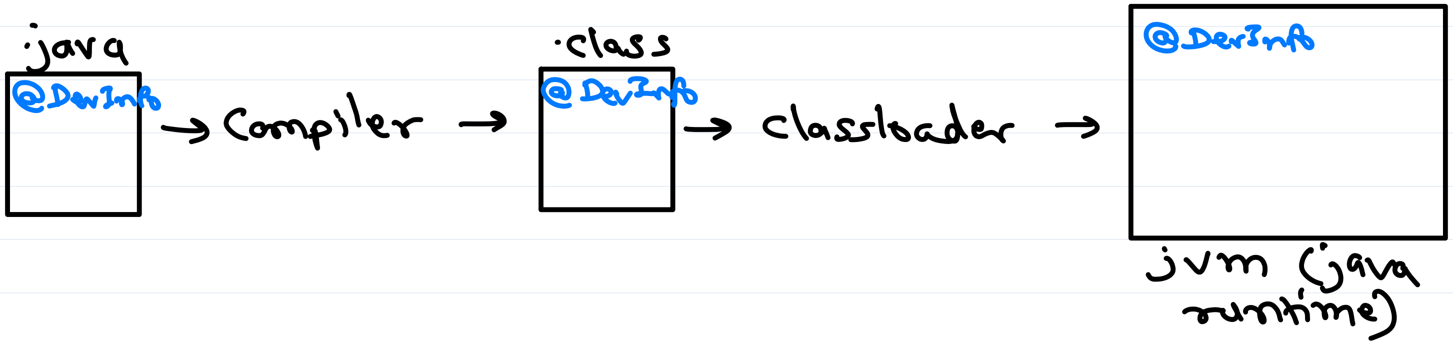
Annotation Retention



Retention = SOURCE
- usually used to give info to compiler.
- Compiler process them & discard them.
- no byte code is added in .class file.
- e.g. @Override



Retention = CLASS (default)
- add metadata to be used at class (byte code) level.
- not loaded into runtime/JVM (by classloader).
- e.g. @KeepName.



Retention = RUNTIME
- add metadata to be used at runtime using reflection technique.
- e.g. most anns in hib & spring.

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Thank you!

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