Learning Goals

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This session will help students to understand about,

- Java access specifiers
- How access specifiers are implemented in classes.

Real World Example of Access Specifier

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I want to post my photos in face book but I don't know how to prevent others from seeing it.

Real World Example of Access Specifier

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Do not worry, face book provides a features where you can define the access rights for each photo album you share.

Real World Example of Access Specifier

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Facebook Album Access

No access: Personal Photos
private access: Family Album
Public access: Other Album

Restricted Access to java classes

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Similar to photo album in face book , in Java the classes methods and variables can be hidden or made visible from other classes using "**Access Specifier**"

Restricted Access to java classes

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Access Specifier?

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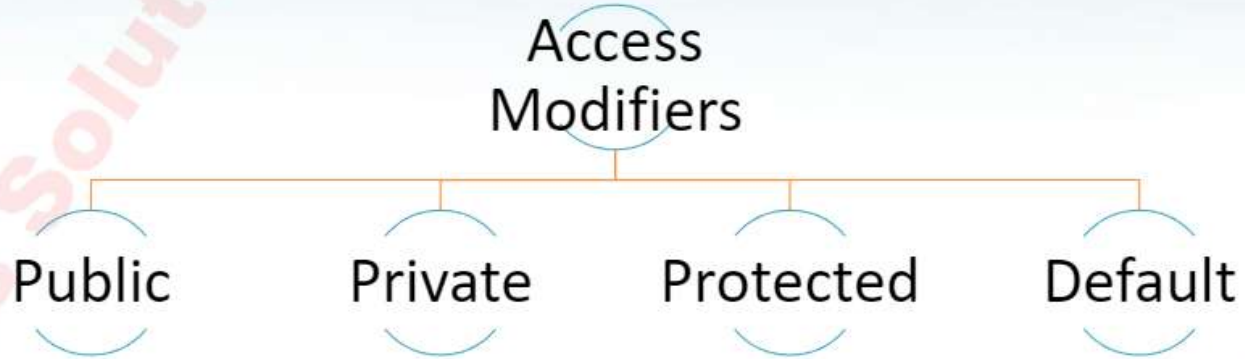
Access specifier are nothing but the access level defined to classes variable & methods.



Analogy with the example:

- *College album* can be made *public* (*can be accessed by any class*)
- *Personal album* can be made *private* (*to be accessed only by the same class*)
- *Family Album* can be left as *protected* (*to be accessed only by the classes in same package (Family)*)

Public access

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Public access specifies that the class members (variables or methods) are accessible by any classes, both inside and outside the class and outside of the package.

Syntax: public <method/variable name>

Illustration:

Public variable:

```
public float salary = 10..23f;
```

Public Method:

```
public calculateSalary(float basicPay, float hra){
        // some code here
 }
```

Public access Illustration

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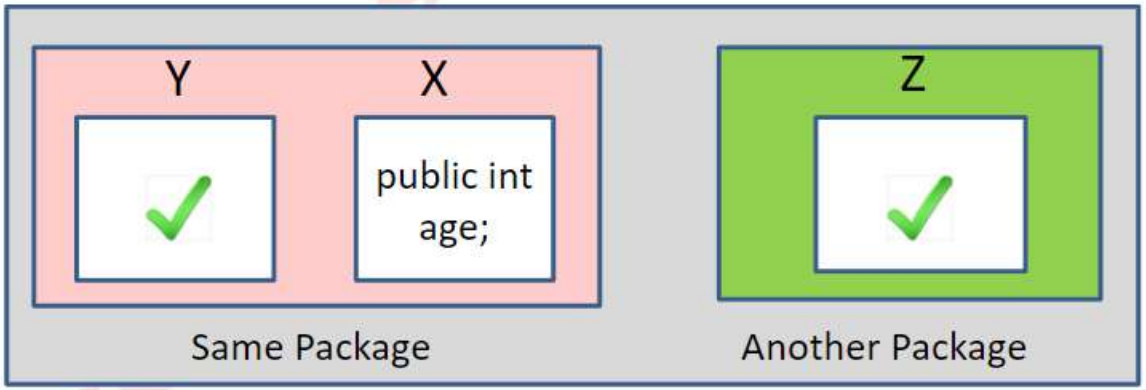
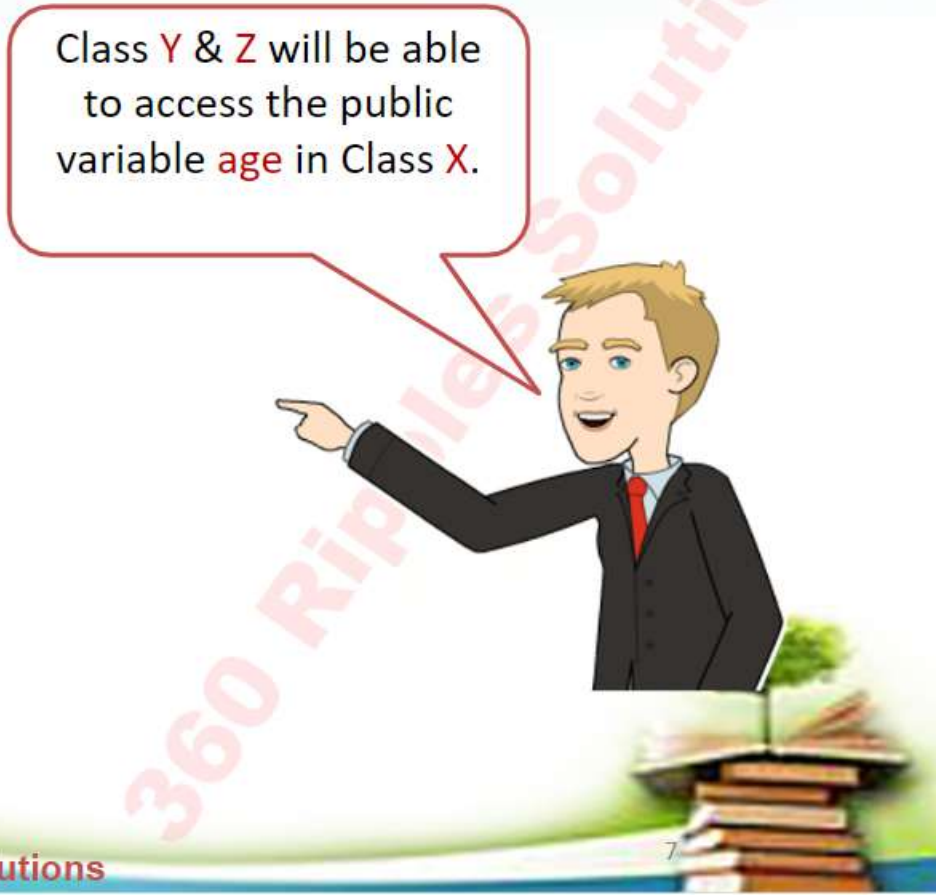
- Assume there are three java classes X, Y, and Z
- Classes X & Y are in the same package where as Class Z is in a different package
- Class X has a public variable “age”





Private access

Click to Continue

Class members defined *Private* are only accessible by the class in which they are defined. Cannot be accessed by any other class.

Syntax : private <variable/method name>

Illustration:

private variable:

```
private float salary = 10..23f;
```

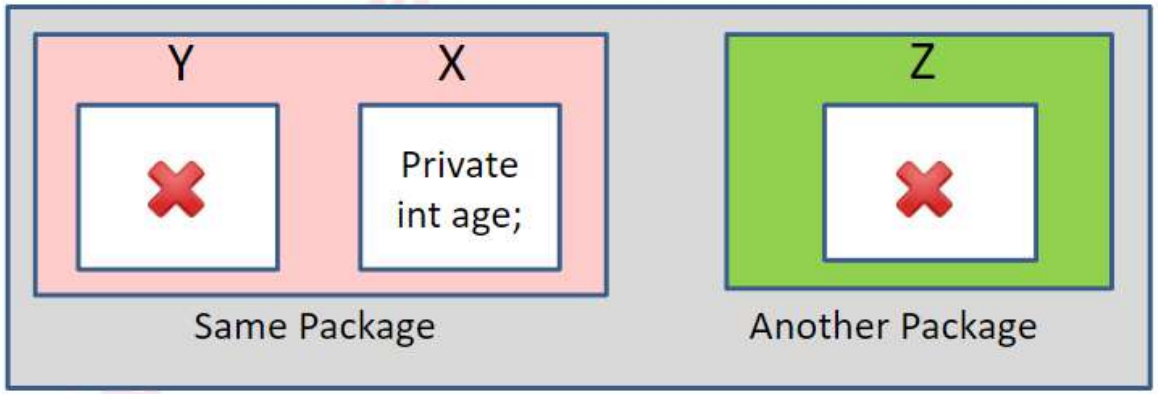
private Method:

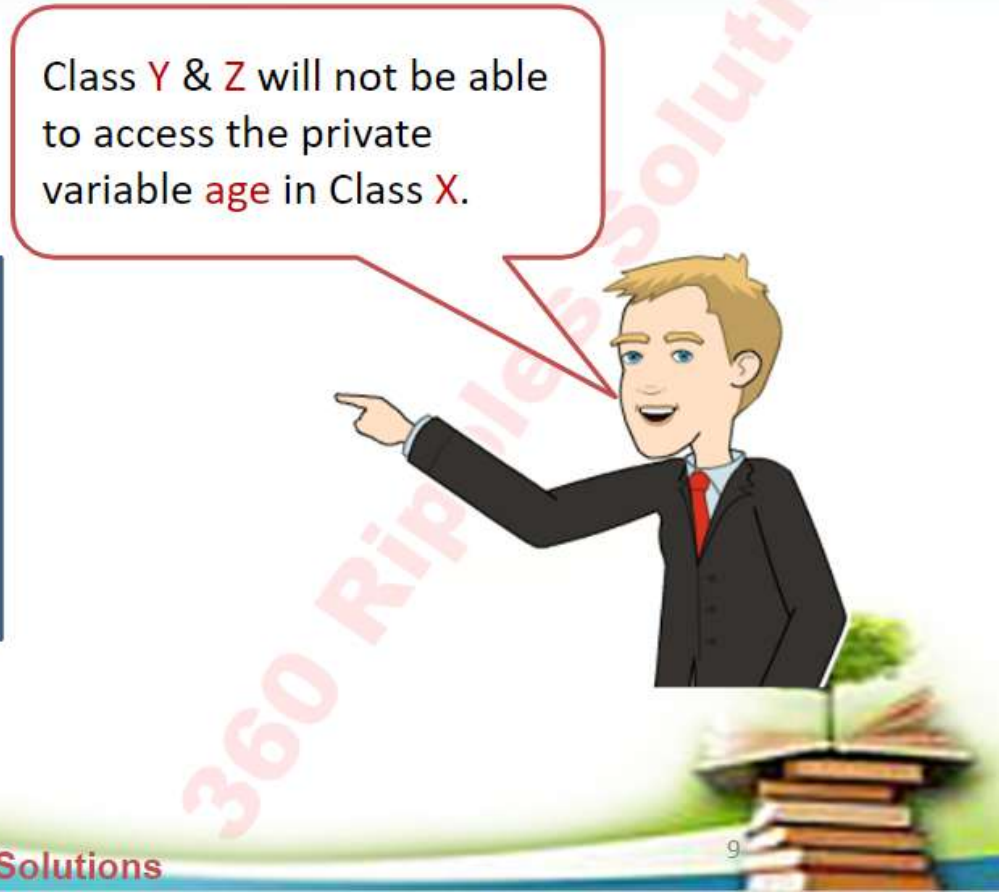
```
private calculateSalary(float basicPay, float hra){
        // some code here
}
```

Private access Illustrations

Click to Continue

Class X has a private variable age





Protected access

Click to Continue

Class members/methods defined as protected are accessible to only classes from same package and the subclasses of the class. The subclass can be in any package.

Syntax: protected <variable/method name>

Illustration:

protected variable:

```
protected float salary = 10..23f;
```

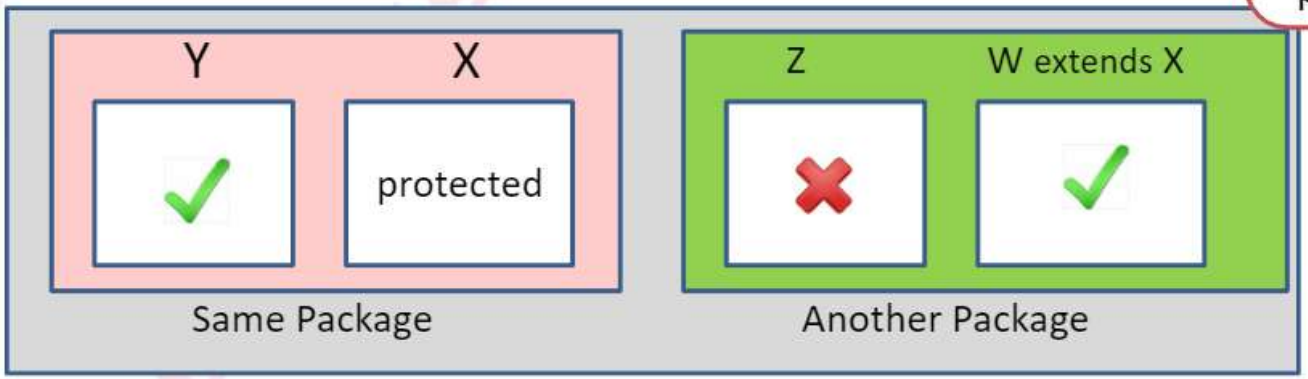
protected Method:

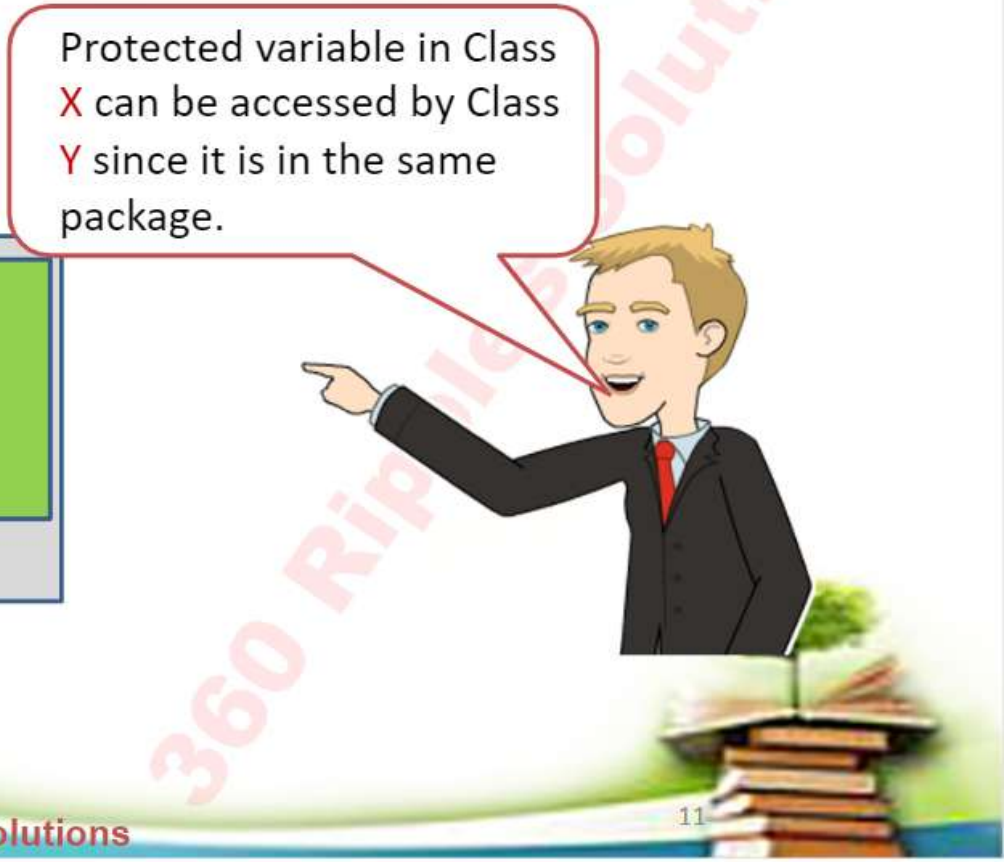
```
protected calculateSalary(float basicPay, float hra){
    // some code here
}
```

Protected access

Click to Continue

- Assume class W extends X and is in a different package.
- Class X has a protected variable.

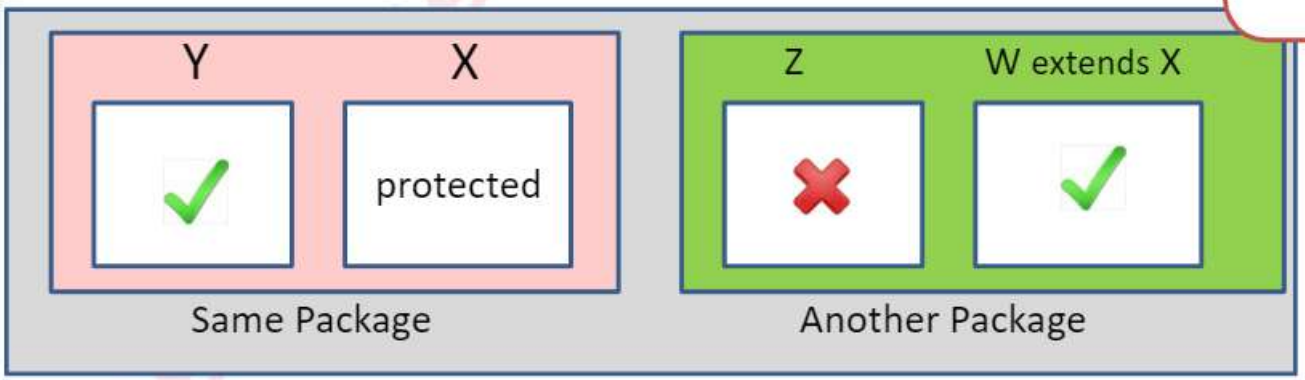


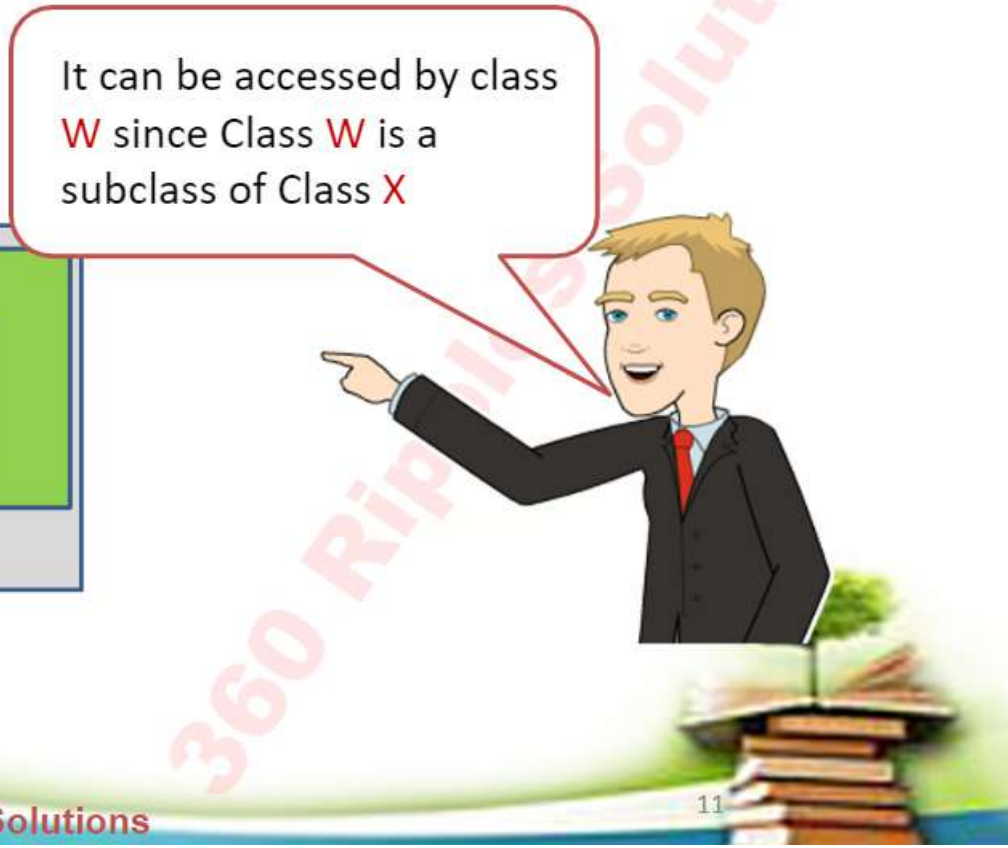


Protected access

Click to Continue

- Assume class W extends X and is in a different package.
- Class X has a protected variable.

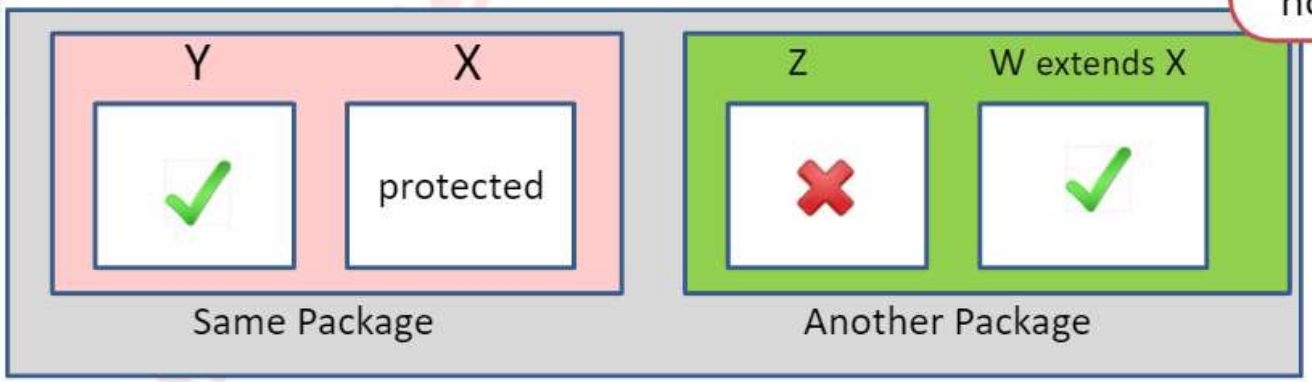


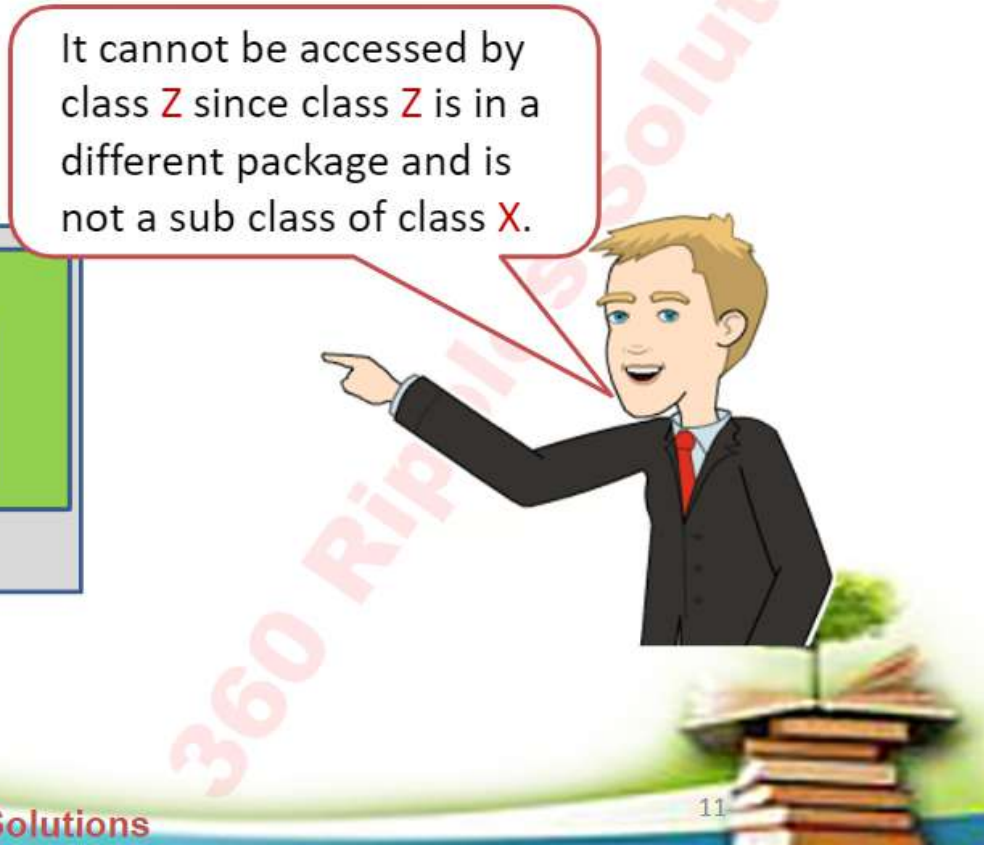


Protected access

Click to Continue

- Assume class W extends X and is in a different package.
- Class X has a protected variable.





Default access

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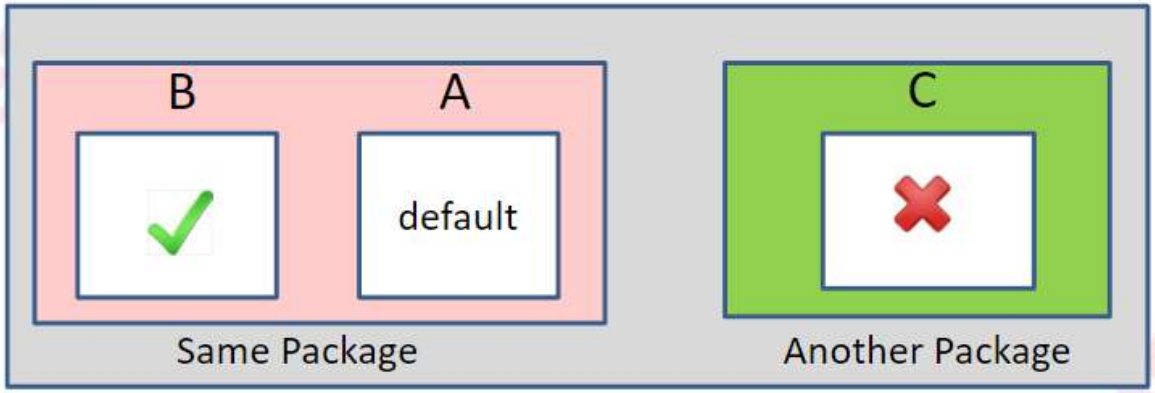
Only classes in the same package can have access to the variables and methods defined as default.

No keyword is required for the default modifier.



Code Example

Click to Continue

```
package com.accessspecifier;

public class PhotoAlbums {

    protected String familyAlbum;
    private String personalAlbum;
    public String collegeAlbum;
    String relaitvesAlbum;

    public void browseCollegeAlbum() {

    }

    private void browsePersonalAlbum() {

    }

    protected void browseFamilyAlbum() {

    }

    void browseRelativeAlbum() {

    }

}
```

Public access to college album

Public access to college album

Code Example

Click to Continue

```
package com.accessspecifier;

public class PhotoAlbums {

    protected String familyAlbum;
    private String personalAlbum;
    public String collegeAlbum;
    String relaitvesAlbum;

    public void browseCollegeAlbum() {

    }

    private void browsePersonalAlbum() {

    }

    protected void browseFamilyAlbum() {

    }

    void browseRelativeAlbum() {

    }

}
```

Protected access to family album.

Protected access to family album method (Package & subclass access)

Code Example

Click to Continue

```
package com.accessspecifier;

public class PhotoAlbums {

    protected String familyAlbum;
    private String personalAlbum;
    public String collegeAlbum;
    String relaitvesAlbum;

    public void browseCollegeAlbum() {

    }

    private void browsePersonalAlbum() {

    }

    protected void browseFamilyAlbum() {

    }

    void browseRelativeAlbum() {

    }

}
```

Default access to relative album.

Default/no access to relative album. (Package access only)

Code Example

Click to Continue

```
package com.accessspecifier;

public class PhotoAlbums {

    protected String familyAlbum;
    private String personalAlbum;
    public String collegeAlbum;
    String relaitvesAlbum;

    public void browseCollegeAlbum() {

    }

    private void browsePersonalAlbum() {

    }

    protected void browseFamilyAlbum() {

    }

    void browseRelativeAlbum() {

    }

}
```

Private access to Personal album.

Private access to Personal album method (Access within class only)

Access Specifier in a nutshell

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Access Modifiers	Same Class	Same Package	Subclass	Other packages
public	Y	Y	Y	Y
Protected	Y	Y	Y	N
No access modifier	Y	Y	N	N
Private	Y	N	N	N

Public and private are the commonly used access specifiers in projects.