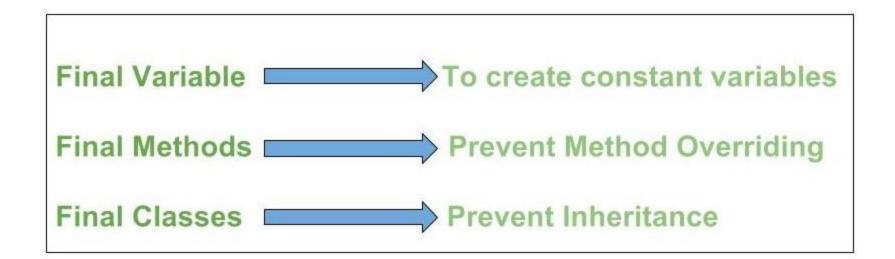
ARGUMENTS & NESTED CLASSES LECTURE 10B

Prof. Anita Agrawal,

BITS, Pilani-K.K.Birla Goa Campus

final keyword in java

- final is a non-access modifier applicable to:
 - Variable
 - Method
 - Class



• final variable:

 When a variable is declared with *final* keyword, it's value cannot be modified.

It is essentially a constant.

- If reference:
 - cannot be re-bound to reference another object
 - Internal state of the object pointed can be changed

The final variable has to be initialized, otherwise compiletime error

Can be initialized only once

Ways to initialize the final variable

Initialization during declaration:

Example:

- final int num = 7;
- static final double length = 52.5
- If not initialised during declaration: Blank variable
- Blank variable initialisation:
 - inside the instance initialisation block
 - inside the constructor
 - inside all the constructors if more than one constructor
 - inside the static block if a static variable

```
//Java program to demonstrate different
// ways of initializing a final variable
 class A
  // a final variable direct initialize
  final double width = 10.5;
  // a blank final variable
  final int sum;
  // another blank final variable
  final int height;
  // a final static variable PI direct initialize
  static final double PI = 3.14;
  // a blank final static variable
  static final double grav_const;
```

```
// instance initializer block for initializing sum
     sum = 25;
// static initializer block for initializing grav_const
  static {
     grav_const = 9.8;
// Constructor for initializing height. Note that if there are more // than one
constructors, you must initialize height in them also
public OOP()
     height = 20;
```

 As you know that a final variable cannot be re-assigned.
 But in case of a reference final variable, internal state of the object pointed by that reference variable can be changed.

Note: This is not re-assigning. This property of *final* is called *non-transitivity*.

 The non-transitivity property also applies to arrays., final arrays. // Java program to demonstrate reference final variable

finref.....

 A final variable cannot be reassigned, doing it, will throw compile-time error. Java program to demonstrate re-assigning final variable will //throw compile-time error

.....finref2

When a final variable is created inside a method/constructor/block, it is called local final variable, and it must be initialized once where it is created.

Java program to demonstrate local final variable

```
class A
  public static void main(String args[])
     // local final variable
     final int x;
     x = 15;
     System.out.println(x);
```

Difference between a normal variable and a final variable

- Values can be reassigned to normal variables, but final variable values cannot be changed once assigned.
- Use final variables only for the values that are required to remain constant throughout the execution of program.

Final classes

- Declared with *final* keyword.
- A final class cannot be extended(inherited).
- Uses of a final class:
 - To prevent inheritance, as final classes cannot be extended.
 - To create an immutable class like the predefined <u>String</u> class.
 - You can not make a class immutable without making it final.

final method

- Declared with a final keyword.
- A final method cannot be overridden
- Declare methods with final keyword to follow the same implementation throughout all the derived classes.

```
//program to illustrate final keyword with the method
class A
  final void m1()
     System.out.println("This is a final method.");
class B extends A
  void m1()
     // COMPILE-ERROR! Can't override.
     System.out.println("Illegal!");
```