

# Scope

Mr. Poole  
Java

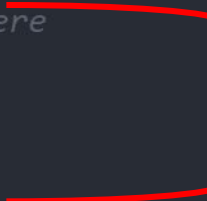
# What is scope?

Scope is when a variable is only accessible inside the region it is created.

In other words, when you can and can't access a variable!

# Easiest example of Scope

```
class starter {  
    public static void main(String args[]) {  
        // Your code goes below here  
  
        System.out.println(x);  
  
        int x = 5;  
  
        System.out.println(x);  
    }  
}
```



X can't be accessed here!

X can be accessed here!  
After it's created!

# Examples of Scope 1

```
if(4 > 3){  
    int answer = 4*3;  
}  
System.out.println(answer);
```

What is the scope of answer here?

Is this an error?

# Examples of Scope 1

```
if(4 > 3){  
    int answer = 4*3;  
}  
System.out.println(answer);
```

Here answer is created  
**WITHIN** the if statement.

The **scope** of **answer** is only  
within the if statement

This code would provide the  
error below.

```
starter.java:13: error: cannot find symbol  
        System.out.println(answer);  
                           ^  
symbol:   variable answer  
location: class starter  
1 error
```

## Examples of Scope 2

What is the scope of done here?

```
int x = 0;
while(true){
    if(x == 10){
        String done = new String("It's finished!");
        break;
    }
    x++;
}
System.out.println(done);
```

## Examples of Scope 2

```
int x = 0;
while(true){
    if(x == 10){
        String done = new String("It's finished!");
        break;
    }
    x++;
}
System.out.println(done);
```

Same as before, String done is created inside the if statement inside the while loop.

**“done” has a scope within the if statement inside the loop.**

Error below:

```
starter.java:18: error: cannot find symbol
    System.out.println(done);
                        ^
    symbol:   variable done
    location: class starter
1 error
```

## Examples of Scope 3

What is the scope of i?

```
for(int i = 0; i < 10; i++){  
  
}  
System.out.print(i);
```



## Examples of Scope 3

```
for(int i = 0; i < 10; i++){  
  
}  
System.out.print(i);
```

“i” is created within the loop

It's scope ends at the last bracket and can't be printed out.

```
starter.java:13: error: cannot find symbol  
    System.out.print(i);  
                      ^  
    symbol:   variable i  
    location: class starter  
1 error
```

# Examples of Scope

We usually see scope errors when it comes to **if statements** and **loops** because they have brackets that split off code from other section.

We can also think of this as **public and private**.

# Accessor Modifier

The chart below shows the **scope** of methods when given a different modifier.

Examples of when methods can be used with given modifiers.

	default	private	protected	public
Same Class	Yes	Yes	Yes	Yes
Same package subclass	Yes	No	Yes	Yes
Same package non-subclass	Yes	No	Yes	Yes
Different package subclass	No	No	Yes	Yes
Different package non-subclass	No	No	No	Yes

# Accessor Modifier

```
public class MrPoole{
```

```
    public int age;
```

```
    String name;
```

```
    public MrPoole(){
```

```
        age = 24;
```

```
        name = "Jacob";
```

```
    }
```

```
    private int getAge(){
```

```
        return age;
```

```
    }
```

```
    public String getName(){
```

```
        return name;
```

```
    }
```

```
}
```

**age's scope** reaches outside of the file

**name's scope** stays within the file (Default private)

**Public** useable anywhere!

**Private**, useable only within the file.

**Public**, usable anywhere!

# Accessor Method

```
public class MrPoole{  
    String name;  
  
    public String getName(){  
        return name;  
    }  
}
```

String name is created as a private variable.

BUT

We can use the “getName” accessor method to access the value outside of the file

## Lab Scope:

1. Fix the files given
2. There are 2 classes and a java file given
3. Fix them so the scope works!

Ideal output below:

```
Shrek IS UGLY!  
Shrek, parfaits may be the most delicious thing on the whole planet!  
Donkey, what are you doing in my swamp?!  
Donkey, what are you doing in my swamp?!  
Donkey, what are you doing in my swamp?!  
Donkey, what are you doing in my swamp?!  
Donkey, what are you doing in my swamp?!  
That printed out 5 times
```