

## Summary 3 - Variables: Fields vs. Parameters vs. Local variables

- What is this?

Type of variable	Description	Scope - <i>where</i> it is legal to refer to the variable	Lifetime - <i>when</i> it is legal to refer to the variable
Field	Associated with objects of the class in which the field is defined	The class in which it is defined	The lifetime of the object with which they are associated
Parameter	Associated with a method; its value is given to its method when the method is called	The body of the method for which it is a parameter	From when its method is called until the time when its method is exited
Local variable	Defined within a method	From the point at which it is declared to the end of its enclosing block	From the time it is declared to the time that its enclosing block is exited

- Example (from JavaEyes)

```
public class Eye extends JPanel implements MouseMotionListener {
    private static final int DEFAULT_RADIUS = 25;
    protected EyeBall eyeBall;
    protected Color eyeColor;
    protected int eyeRadius;
    ...
    public void mouseMoved(MouseEvent event) {
        Point mousePoint = new Point(event.getX(), event.getY());
        this.look(mousePoint);
    }
}
```

DEFAULT\_RADIUS, eyeBall, eyeColor and eyeRadius are fields. Every Eye has these four items of data associated with it (the DEFAULT\_RADIUS is shared by all Eyes – see the Summary on static).

event is a parameter of the method mouseMoved.

mousePoint is a local variable of the method mouseMoved.

- For further study:

- *Big Java*, section 3.4 Instance Fields, describes fields.
- *Big Java*, section 2.4 Method Parameters and Return Values, describes how parameters are used, and section 3.8 Implicit and Explicit Parameters distinguishes explicit parameters of a method from its implicit parameter.
- *Big Java*, section 3.7 Categories of Variables, discusses lifetime, and section 8.8 Scope discusses scope.
- Authors of this summary: David Mutchler.
- See also the Summaries on Variables: Primitive Type versus Object Type