Classes

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Integer Division

```
private static final int FACE_SIZE = HEAD_SIZE * (4/5);
```

- WARNING! FACE_SIZE is not 80% of the HEAD_SIZE!
- 4 and 5 are integers
- 4 / 5 is integer division and results in an integer
- Fraction is always dropped, so 4 / 5 is 0!

Solution: Do the division last

```
private static final int FACE_SIZE = HEAD_SIZE * 4/5;
```

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Classes

- Part of a program
- Combines
  - Data
  - Methods that manipulate the data

Classes in Java

```
public class BestBasketball extends WindowController {
    private FramedOval hoop;
    private FilledOval ball;                    Data
    ...

    public void begin() {                       Methods
       ...
    }

    public void onMousePress (Location point) {
       ...
    }
}
```

Other Kinds of Classes

- Location
  - getX, getY
- Color
  - getRed, getBlue, getGreen
- FilledRect
  - getHeight, setHeight, getColor, setColor, move, moveTo, ...

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Understanding Method Signatures

- The declaration of the setColor method for FilledRect looks like this:

```
public void setColor (Color newColor) {
    ...
}
```

Method signature

- A call to the setColor method looks like this:

```
rect.setColor (Color.GREEN);
```

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Signatures & Method Calls

```
public class FilledRect {
    ...
    public void setColor (Color newColor) {
        ...
    }

}
```

```
public class MyClass {
    ...
    public MyClass () {
        FilledRect rect = new FilledRect (...);
        rect.setColor (Color.GREEN);
    }
}
```

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Signatures & Method Calls

```
public class FilledRect {
    ...
    public double getX () {
        ...
    }

}
```

```
public class MyClass {
    ...
    public MyClass () {
        FilledRect rect = new FilledRect (...);
        double left = rect.getX ();
    }
}
```

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Signatures & Constructor

```
public class FilledRect {
    ...
    public FilledRect (int x, int y, int width, int height,
            DrawingCanvas canvas) {
        ...
    }

}
```

```
public class MyClass extends WindowController {
    ...
    public MyClass () {
        FilledRect rect = new FilledRect (10, 20, 30, 40, canvas);
    }
}
```


Constructors/Methods We Have Used

- Location class
  - public Location (double x, double y)
  - public double getX()
  - public double getY()
- RandomIntGenerator
  - public RandomIntGenerator (int min, int max)
  - public int nextValue()

Constructors/Methods We Have Used

- FilledRect, FramedRect, FilledOval, FramedOval
  - public FilledRect (int x, int y, int width, int height, DrawingCanvas canvas)
  - public FilledRect (Locatioin topLeft, int width, int height, DrawingCanvas canvas)
  - public boolean contains (Location point)
  - public void move (int dx, int dy)
  - public void moveTo (int x, int y)
  - public void moveTo (Location topLeft)
  - public void setColor (Color newColor)

Constructors/Methods We Have Used

- Line
  - public Line (int startX, int startY, int endX, int endY, DrawingCanvas canvas)
  - public Line (Location start, Location end, DrawingCanvas canvas)
  - public boolean contains (Location point)
  - public void move (int dx, int dy)
  - public void moveTo (int x, int y)
  - public void moveTo (Location topLeft)
  - public void setColor (Color newColor)

Constructors/Methods We Have Used

- Text
  - public Text (String text, int x, int y, DrawingCanvas canvas)
  - public Text (String text, Location topLeft, DrawingCanvas canvas)
  - public boolean contains (Location point)
  - public void move (int dx, int dy)
  - public void moveTo (int x, int y)
  - public void moveTo (Location topLeft)
  - public void setColor (Color newColor)
  - public void setFontSize (int size)
  - public void setText (String text)

Constructors/Methods We Have Used

- Color
  - public Color (int red, int green, int blue)

Methods/Variables We Have Used

- WindowController
  - public void resize (int width, int height)
  - DrawingCanvas canvas --- a variable!

WindowController

public class BestBasketball extends WindowController

- "extends WindowController" allows us to write a class that provides mouse handling capabilities
  - onMousePress, onMouseRelease, onMouseDrag, ...
- "extends WindowController" also allows us to write the begin method that builds the initial world
- "extends WindowController" lets us refer to the "canvas" and call the "resize" method

Classes that do not "extend WindowController" cannot define mouse event handlers!
And cannot use canvas without declaring it!