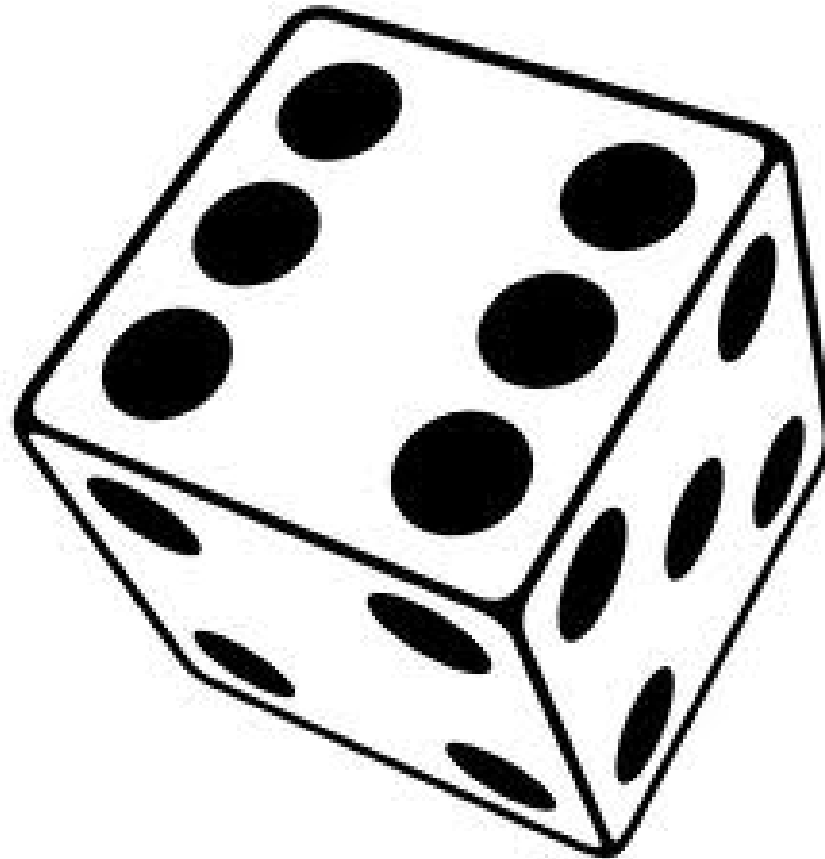


Randomness

# Being Random



# Random Number Generators



# RandomGenerator

- The class **RandomGenerator** acts as a random number generator.
  - Need to **import** `acm.util.*`;
- An instance of **RandomGenerator** can be used to generate random numbers.

# Time-Out for Announcements

# Assignment 2

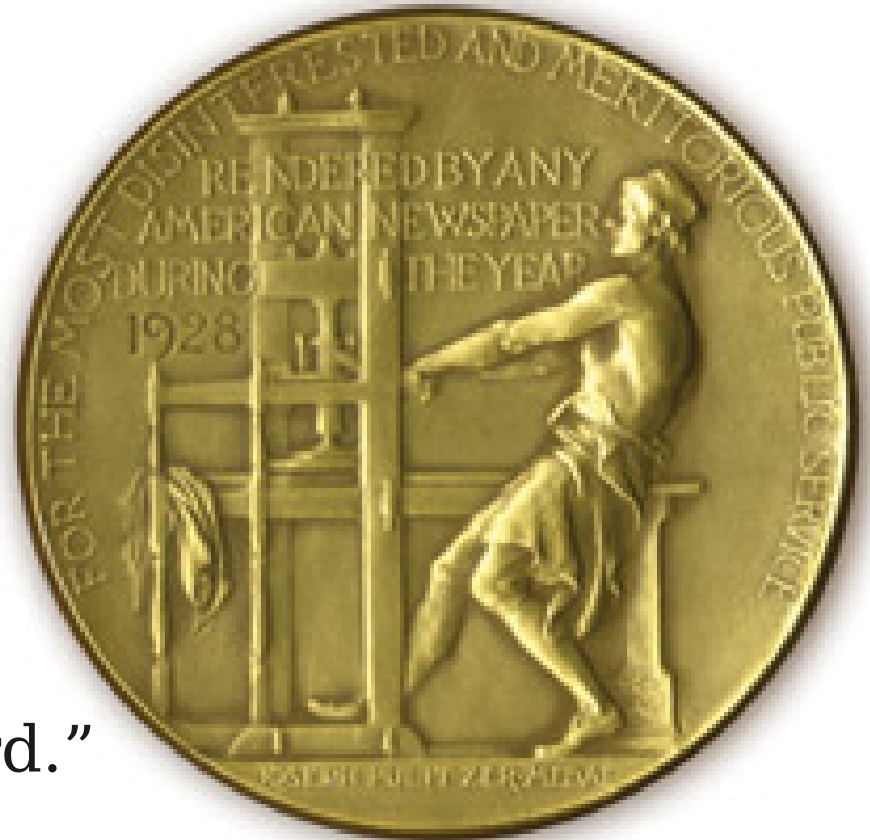
- Assignment 2 is due Friday.
- Have questions?
  - Stop by the LaIR between 6PM - Midnight tonight or on Thursday.
  - Visit Keith's office hours today from 4:30PM - 6:30PM.
  - Visit Vikas's office hours tomorrow from 2:15PM - 4:15PM.
  - Email your section leader.
  - Ask on QuestionHut.

# CS and Journalism



# The 2013 Pulitzer Prizes

“Awarded to the Sun Sentinel, Fort Lauderdale, FL, for its well documented investigation of off-duty police officers who recklessly speed and endanger the lives of citizens, leading to disciplinary action and other steps to curtail a deadly hazard.”



<http://www.pulitzer.org/citation/2013-Public-Service>

The Brown Institute for Media Innovation

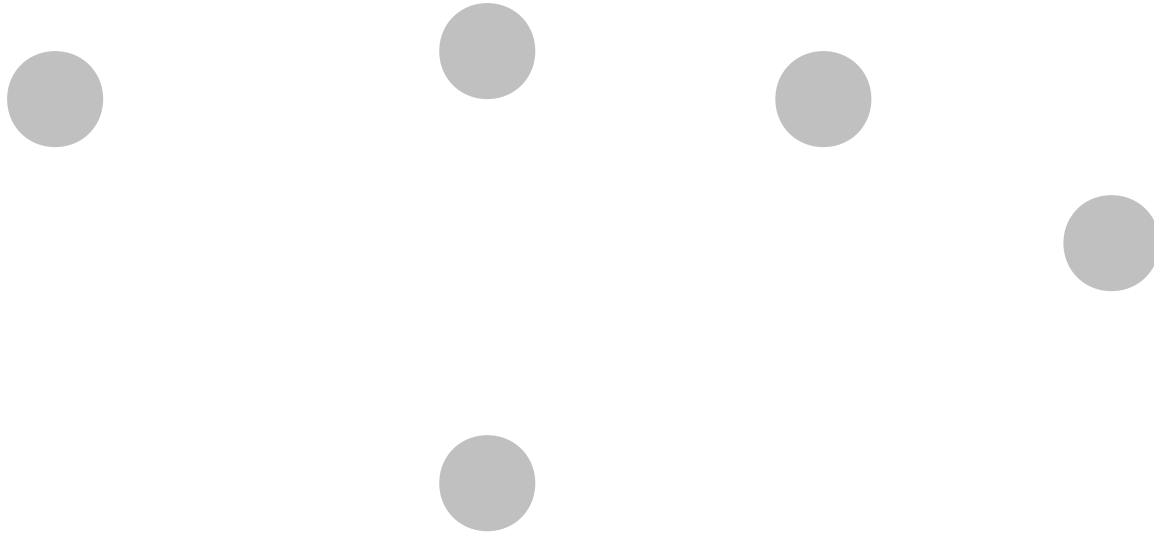
**<http://brown.stanford.edu/>**

# Google Journalism Fellowship

**<http://www.google.com/get/journalismfellowship/>**

Back to CS106A!

# A Snowfall Simulation



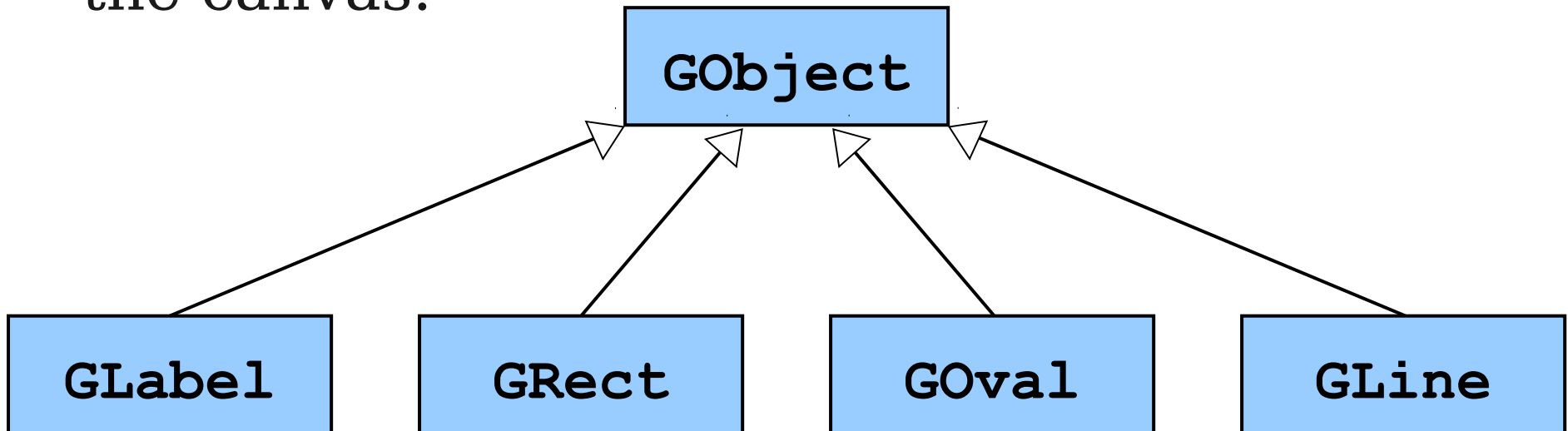
Let it Snow!

# Accessing the Canvas

- It is possible to determine what, if anything, is at the canvas at a particular point.
- The method

```
GObject getElementAt(double x, double y);
```

returns which object is at the given location on the canvas.



# Accessing the Canvas

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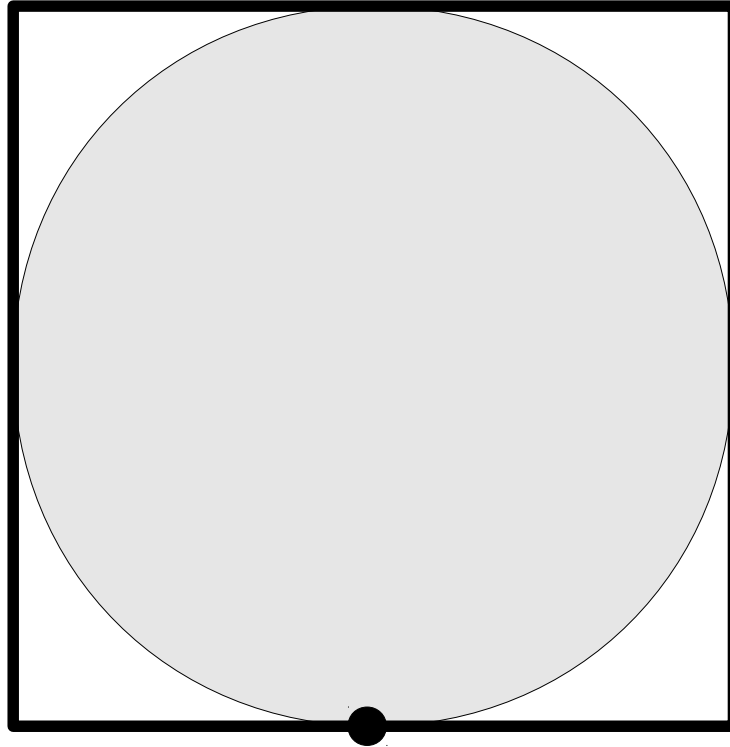
returns which object is at the given location on the canvas.

- The return type is `GObject`, since we don't know what specific type (`GRect`, `GOval`, etc.) is really there.
- If no object is present, the special value `null` is returned.



# A Simple Collision Detector

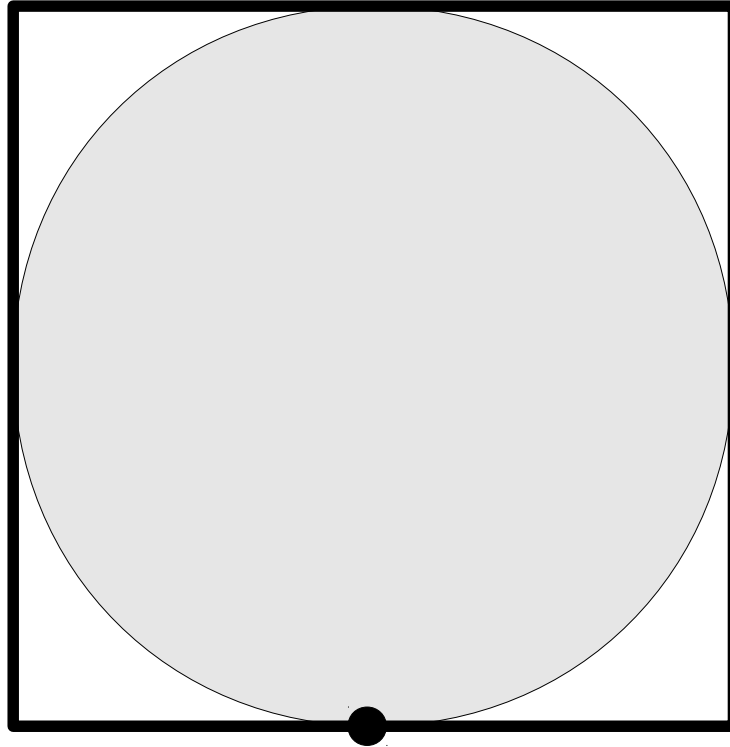
$(x, y)$



$(x + 2r, y + 2r)$

# A Simple Collision Detector

$(x, y)$



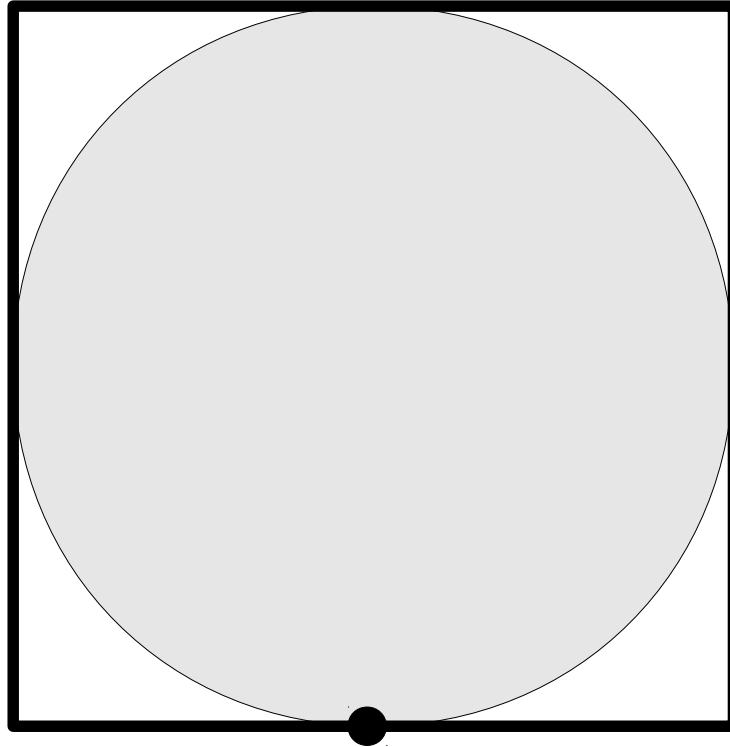
$(x + r, y + 2r)$

$(x + 2r, y + 2r)$

What Went Wrong?

# A Simple Collision Detector

$(x, y)$

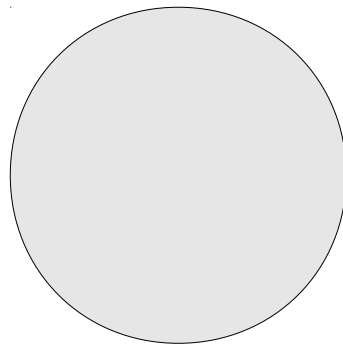
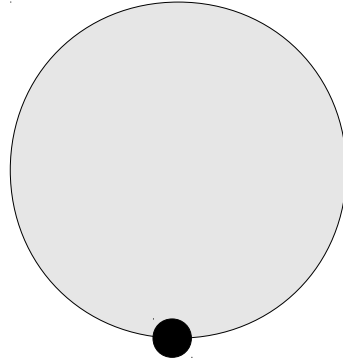


$(x + r, y + 2r)$

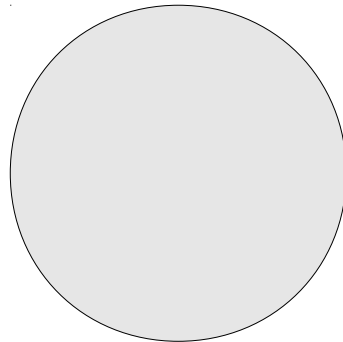
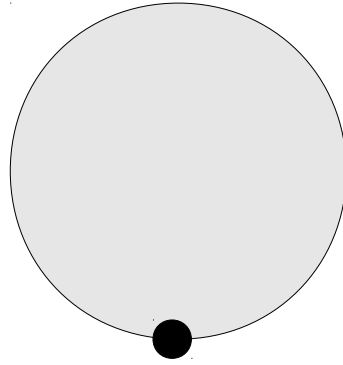
$(x + 2r, y + 2r)$

What Went Wrong (This Time)?

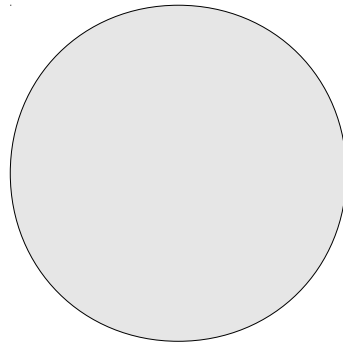
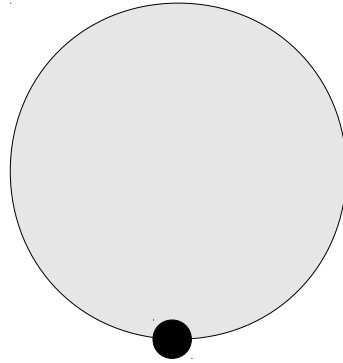
# A Simple Collision Detector



# A Simple Collision Detector

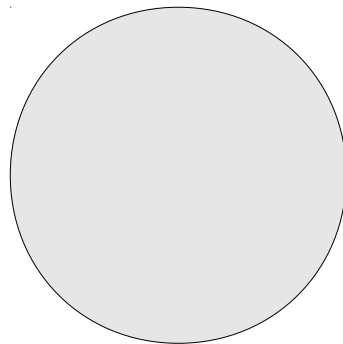
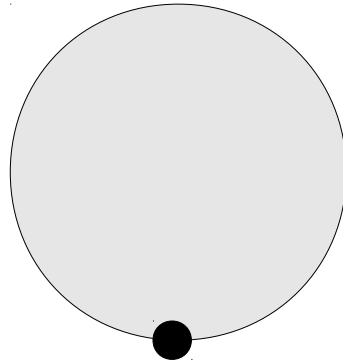


# A Simple Collision Detector

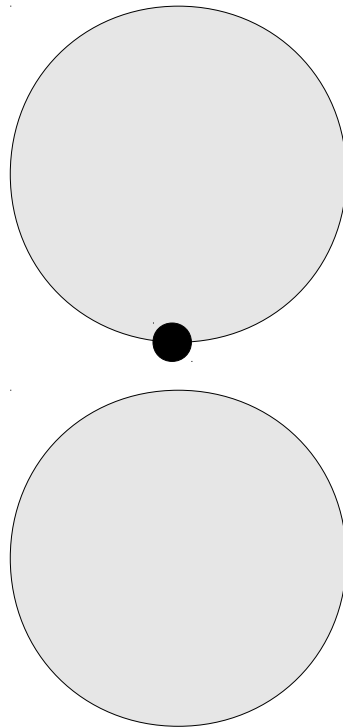




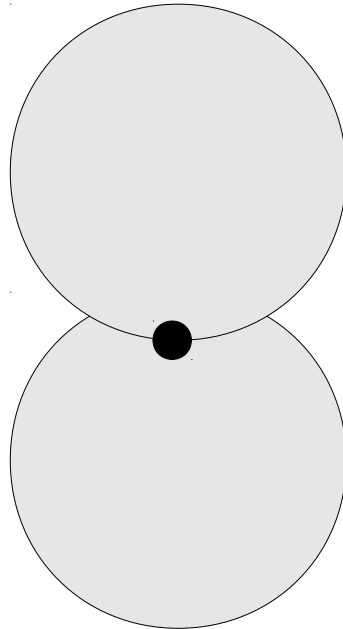
# A Simple Collision Detector



# A Simple Collision Detector



# A Simple Collision Detector



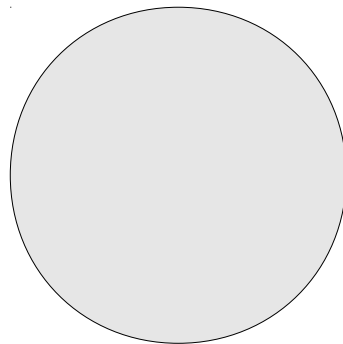
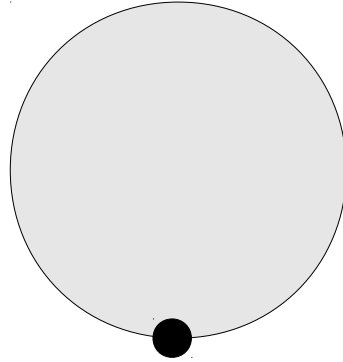
# Reordering Objects

- Each `GObject` can have its **z-order** adjusted.
- The method  

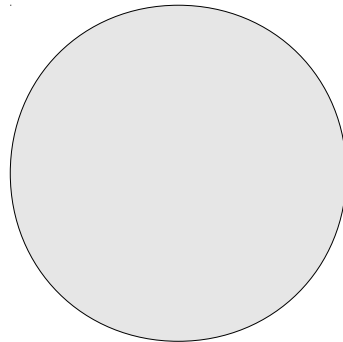
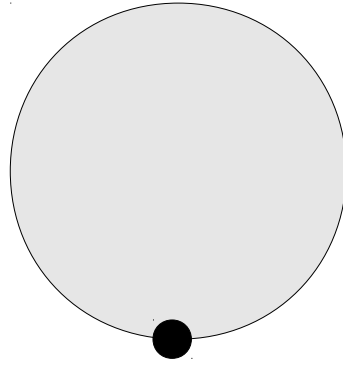
```
object.sendToBack ( ) ;
```

moves the object to the back of the z-order.
- `getElementAt` will return the topmost object where it hits.

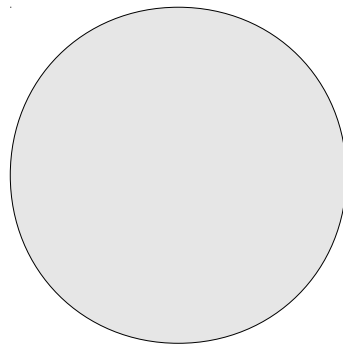
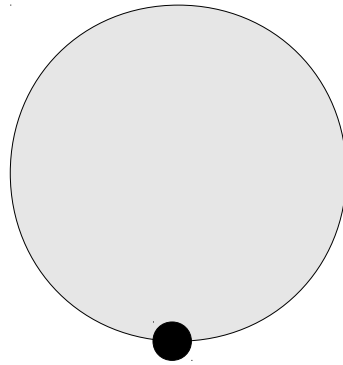
# A Simple Collision Detector



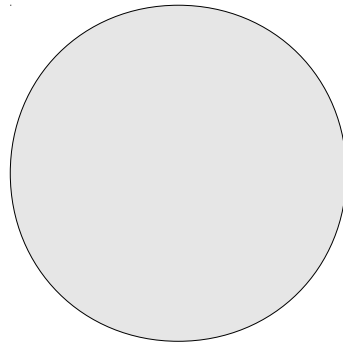
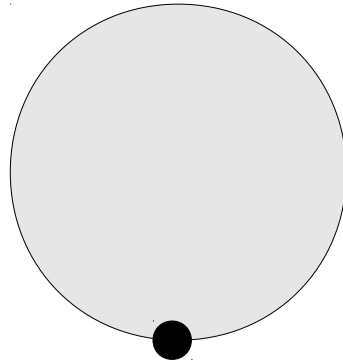
# A Simple Collision Detector



# A Simple Collision Detector

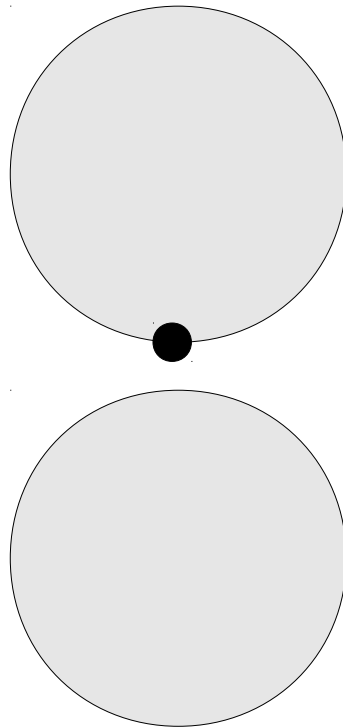


# A Simple Collision Detector





# A Simple Collision Detector



# A Simple Collision Detector

