

Opening Exercise

Last time, we created a `Die` class with a `roll()` method.

*Write a bit of code to get two rolls where the second roll is **different** from the first.*

```
> Die d = new Die( 6 );  
> d.uniqueRolls();  
Rolls: 2 5
```

Exercise: Improving Our Solution

In our first version, we produce only **two** unique rolls.

*Modify your solution so that it can produce **any number** of rolls where all of the rolls are unique.*

```
> java Die  
18 38 25 44 42
```

Lesson 1 from This Exercise

*Solve a simple case first.
Simple code is easier to write
than complex code.*

If you want an arbitrary number of unique rolls,
solve the case of two unique rolls.

Lesson 2 from This Exercise

*Use your simple solution
to solve the general case.*

*The general solution almost always
contains a kernel of the simple solution.*

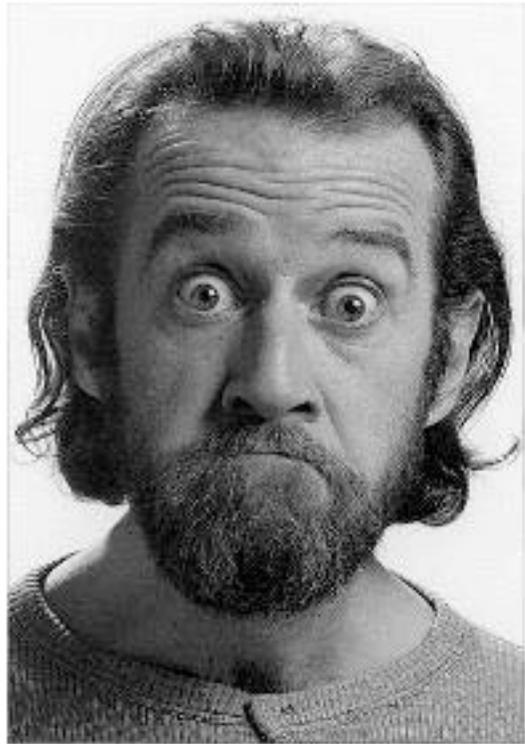
```
for ( int i = 0; i < count; i++ )
{
    int roll = this.roll();
    while ( isRepeat(roll, result, i) )
        roll = this.roll();
    result[i] = roll;
}
```

Lesson 3 from This Exercise

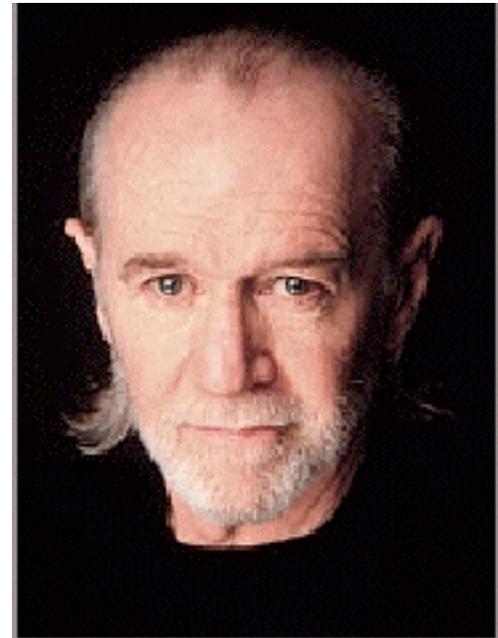
*Nested loops can be complicated.
Creating a helper method can make
it easier to write the code
— and read, too!*

```
for ( int i = 0; i < count; i++ )
{
    int roll = this.roll();
    while ( isRepeat(roll, result, i) )
        roll = this.roll();
    result[i] = roll;
}
```

A File is ...

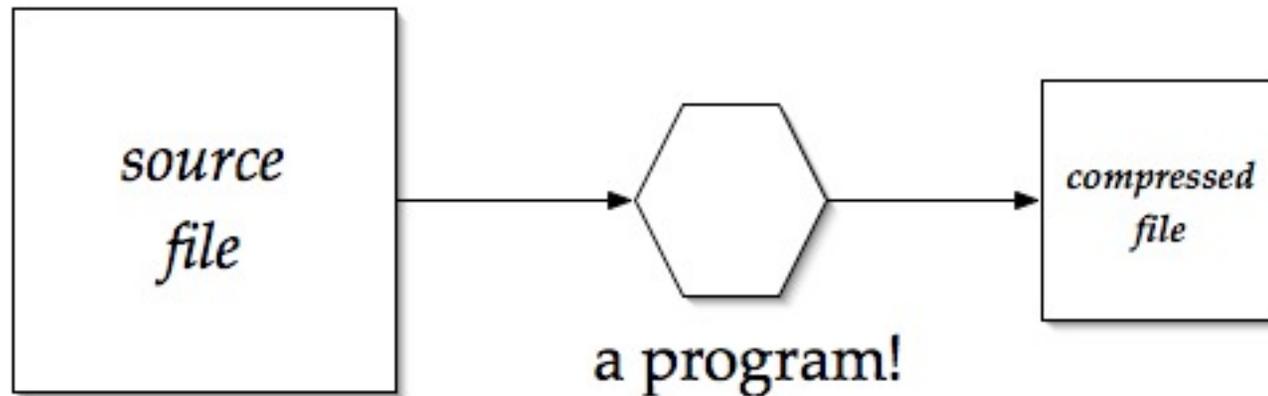


**a place
for your stuff**



Data Compression and Files

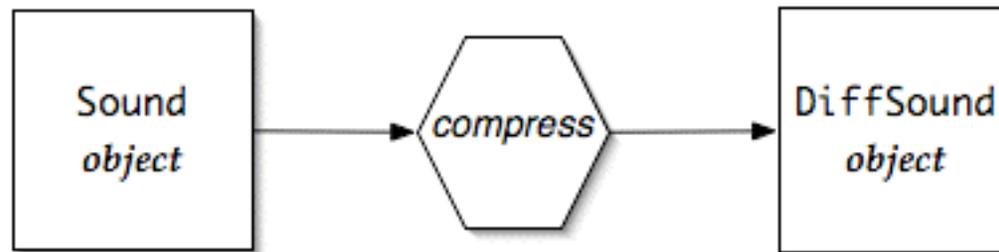
This is what I showed to demonstrate compression:



But this isn't actually how
our data compression
for Sound worked.

Our Sound Compression

It did this:



To save our DiffSound objects,
we need to write them to a file.

How to Write to a File

A simple way of writing a file is:

1. Create a file object.
2. Write data to it using its `write()` and `newLine()` methods.
3. Close the file.

#2 and #3 are just like what we've done in the past.
#1 requires a "*trust me*" moment or two — for now.

Our Compressed File

... is bigger than the original!

Why?

Our Compressed File

FileWriters are for creating *text* files,
and text is an inefficient encoding!

This semester, we will spend our time
dealing with text as our third medium.

To save our data in a more compact format,
we will have to learn about
another kind of file object —
in CS II, or by our own research!

Quick Exercise

Before now, we have *mirrored* pictures and sounds.

Write a bit of code to mirror a String.

For example:

"Eugene Wallingford is the finest CS I instructor I know."

gives

".wonk I rotcurtsni I SC tsenif eht si drofgnillaW eneguE"