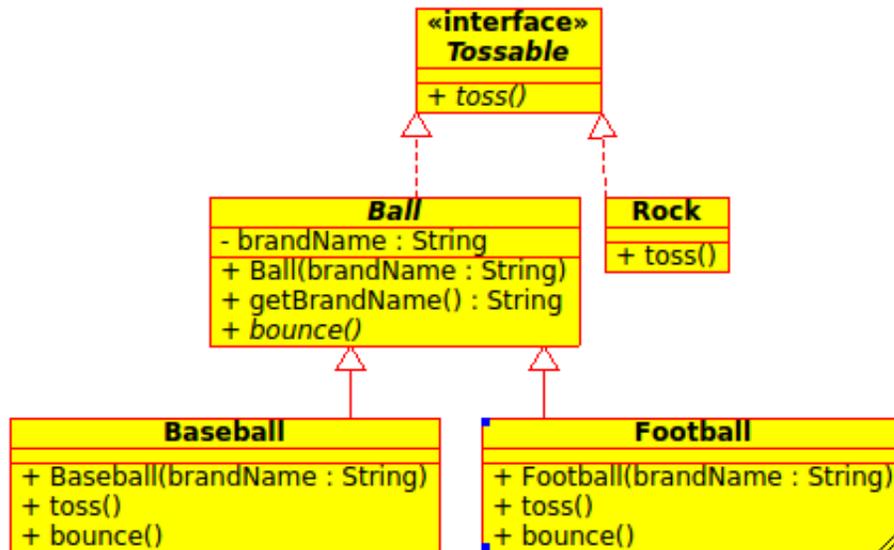# Interfaces and Abstract Classes

1. Fill in each cell of the table with one of three values:

- **Y** An object of this type could be assigned to a variable of this type.
- **N** An object of this type could *not* be assigned to a variable of this type.
- **–** It is not possible to instantiate an object of this type.

		Object Type				
		Tossable	Ball	Rock	Baseball	Football
	Tossable					
	Ball					
Variable Type	Rock					
	Baseball					
	Football					

2. Write the source code for the UML diagram (in the space provided on the next two pages).

- In *Rock.java*, the `toss` method should print `"Tossing a Rock!"`.

- In *Baseball.java*, the `toss` method should print `"Tossing a Baseball!"`, and the `bounce` method should print `"Bouncing a Baseball!"`.

- In *Football.java*, the `toss` method should print `"Tossing a Football!"`, and the `bounce` method should print `"Bouncing a Football!"`.

Tossable.java

Rock.java

Ball.java

Baseball.java

Football.java

3. On your computer, create a folder for today's lab (under `src/labs`). Type the code that you wrote on the previous two pages (in files named *Tossable.java*, *Rock.java*, *Ball.java*, *Baseball.java*, and *Football.java*). Make a note of any compiler errors or other mistakes that you find.

4. In the table below, predict whether each code snippet will:

- **N** – not compile;

- **X** – compile but generate an exception at run-time; or

- **R** – compile and run without generating an exception.

Note: Leave the "Actual Result" column blank until the next question.

	Code Snippet	Prediction	Actual Result
a)	`Ball ball = new Football("Spalding");`		
b)	`Ball ball = new Football("Spalding");` `Baseball baseball = (Baseball) ball;`		
c)	`Object obj = new Baseball("Spalding");`		
d)	`Object obj = new Baseball("Spalding");` `Tossable tossable = obj;`		
e)	`Tossable tossable = new Baseball("Spalding");` `Object obj = tossable;`		
f)	`Tossable tossable = new Baseball("Spalding");` `tossable.getBrandName();`		

5. On your computer, create a file named *Main.java* with a `main()` method. Copy and paste each snippet from the previous question into `main()`, and run the program. Record the actual results and discuss any differences with your partner or team. Write a summary of your discussion: