



ACTIVITY 2

Designing and Implementing a Custom Class

You have likely created a class from a given description or specification several times. This is an important skill, but equally important is the ability to determine essential information to include when creating a class. What is “essential” can vary based on perspective, or can be determined by a question that is being asked or a problem that is attempted to be solved. This activity will give you an opportunity to practice making this type of determination. Consider the following selection.

	Name	Type	Calories	Protein	Fat	Sodium	Fiber	Carbohydrates	Sugar	Potassium	Vitamins	Shelf	Weight	Cups	Rating
100% Bran	C	70	4	1	130	10	5	6	280	25	3	1	0.33	68.402973	
100% Natural Bran	C	120	3	5	15	2	8	8	135	0	3	1	1	33.983679	
All-Bran	C	70	4	1	260	9	7	5	320	25	3	1	0.33	59.425505	
All-Bran with Extra Fiber	C	50	4	0	140	14	8	0	330	25	3	1	0.5	93.704912	
Almond Delight	C	110	2	2	200	1	14	8	-1	25	3	1	0.75	34.384843	
Apple Cinnamon Cheerios	C	110	2	2	180	1.5	10.5	10	70	25	1	1	0.75	29.509541	
Apple Jacks	C	110	2	0	125	1	11	14	30	25	2	1	1	33.174094	
Basic 4	C	130	3	2	210	2	18	8	100	25	3	1.33	0.75	37.038562	
Bran Chex	C	90	2	1	200	4	15	6	125	25	1	1	0.67	49.120253	
Bran Flakes	C	90	3	0	210	5	13	5	190	25	3	1	0.67	53.313813	
Cap'n'Crunch	C	120	1	2	220	0	12	12	35	25	2	1	0.75	18.042851	
Cheerios	C	110	6	2	290	2	17	1	105	25	1	1	1.25	50.764999	
Cinnamon Toast Crunch	C	120	1	3	210	0	13	9	45	25	2	1	0.75	19.823573	
Clusters	C	110	3	2	140	2	13	7	105	25	3	1	0.5	40.400208	
Cocoa Puffs	C	110	1	1	180	0	12	13	55	25	2	1	1	22.736446	
Corn Chex	C	110	2	0	280	0	22	3	25	25	1	1	1	41.445019	
Corn Flakes	C	100	2	0	290	1	21	2	35	25	1	1	1	45.863324	
Corn Pops	C	110	1	0	90	1	13	12	20	25	2	1	1	35.782791	
Count Chocula	C	110	1	1	180	0	12	13	65	25	2	1	1	22.396513	
Cracklin' Oat Bran	C	110	3	3	140	4	10	7	160	25	3	1	0.5	40.448772	
Cream of Wheat (Quick)	H	100	3	0	80	1	21	0	-1	0	2	1	1	64.533816	

<https://www.kaggle.com/crawford/80-cereals/version/2#cereal.csv>

1. Each row of the table represents an instance of an object. What is the best name for that object?

Cereal

2. Your teacher will provide you with a question to answer related to the above table.

Write the question here:

The cereal with the most sugar on the list is Apple Jacks. The cereal with the most fiber on the list is All-Bran with extra fiber.

3. You will now design a class to describe that object and answer your given question.

Write the class header:

class Cereal

4. How many instance variables will you create?

I will create one instance variable for each column on the chart, equating to 15 instance variables.

5. List the data types and names you will use for the instance variables.

String name, char type, int calories, int protein, int fat, int sodium, int fiber, int carbohydrates, int sugar, int potassium, int vitamins, int shelf, int weight, double cups, double rating

6. Create a new Java file named `Cereal.java` and implement the class described above. Your class should contain all necessary instance variables, constructors, accessors methods, and a `toString` method.

Tips

Constructors are not methods and so have no return type. They are special blocks of code that for the purposes of this class should be declared public and have the same name as the class.

When assigning values to instance variables the type of variable cannot be included. If the type is included before the variable name in the constructor, this creates a local variable of the same name that is initialized and the instance variables of the object are never initialized. Once the constructor is complete the local variables no longer exist, leaving only the uninitialized instance variables.

7. Write a `main` method to test your `Cereal` class by implementing multiple instances of `Cereal` objects. This program should include lines instantiating `Cereal` objects.

Check Your Understanding

8. Given your class design, determine one additional question that you can answer without making any changes to `Cereal.java`.

In order from least to greatest, which cereals have the best ratings?

9. Identify one additional question that can be answered from the given data that you are not able to answer based on your implementation of `Cereal.java`.

What do experts say is the best cereal to consume in the list?

10. What modification could you make in order to answer this question?

I could add a new boolean instance variable named "isExpertRecommended" which signifies whether experts recommend the cereal or not.
