Static Class Members

https://csci-1301.github.io/about#authors

June 30, 2021 (04:07:25 PM)

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1 A Class for Chemical Elements

You will study and modify a class for chemical elements[1] (consult https://en.wikipedia.org/wiki/List_of_chemical_elements#List for a complete list).

1.1 Reading

Download ChemElemProject[2], extract the project, open it in VS, compile and execute it. Now read the code in "ChemElem.cs" and "Program.cs".

The class definition "ChemElem.cs" contains:

- Three attributes,
- One constructor,
- One static method,
- One methods that returns the melting point in Celsius,
- One `ToString` method.

The application program "Program.cs" performs one simple conversion from Kelvin to Celsius, using data given by the user, create and display a ChemElem object (implicitly calling the `ToString` method).

1.2 Modifying

Do the following:

1. In "ChemElem.cs", write getters and setters for all attributes
2. In "Program.cs", create a second object using our custom constructor, and display the value of its attributes using the getters you previoulsy defined.
3. In "ChemElem.cs", write a no-args constructor.

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[1]https://en.wikipedia.org/wiki/Chemical_element
[2]ChemElemProject.zip

4. In "Program.cs", create an object using the no-args constructor, and set its values using the setters your previously defined.
5. In "Program.cs", display on the screen the string returned by the `ToString` method when it is called by the object you created at the previous step.
6. In "Program.cs", try calling the `FromKelvinToCelsius` method with one of your object, for instance using `hydrogen.FromKelvinToCelsius(34)`. What happens?
7. Still in "Program.cs", try calling the `MeltingInCelsius` method with the class, for instance using `ChemElem.MeltingInCelsius();`. What happens?

1.3 Enhancing

We now want to significantly improve this class, by adding

1. An attribute for the boilling point,
2. All the tools needed to display the information in Fahrenheit degree, in addition to Celsius and Kelvin.

You may want to comment part, of all of your "Program.cs" file, before starting to change your class.

- Add an attribute for the boiling point (in Kelvin).
- Modify the constructor, so that it takes a forth argument, and sets its value to be the value of the boiling point attribute.
- Create a *static* `FromKelvinToFahrenheit` method, taking inspiration from the `FromKelvinToCelsius` method.
- Create a `MeltingInFahrenheit` method, that returns the melting point in Fahrenheit of the calling object. This method should use your `FromKelvinToFahrenheit` method.
- Create a `BoilingInFahrenheit` method, that return the boiling point in Fahrenheit of the calling object. This method should use your `FromKelvinToFahrenheit` method.
- Modify the `ToString` method, so that the string returned includes

  - The name of the chemical element and its atomic number,
  - The melting point in Kelvin and in Fahrenheit,
  - The boiling point in Kelvin and in Fahrenheit.

You should test all of those modifications in your "Program.cs" file as you implement them. Use relevant data, test your program, and make sure the behaviour is the expected behaviour.