

Practical: Static (class) methods

1. The fahrenheit to celcius temperature conversion program discussed in an earlier class can be regarded as involving three stages; a) the user inputs a temperature in degrees Fahrenheit b) the corresponding temperature in degrees celcius is calculated, and c) the result is printed to screen along with an appropriate message. Note that: $C = (F-32) \times 5/9$.

Write a new version of the program so that step b) is implemented as a user-written static method *calcTempC()* and c) is implemented as a user-written static method *displayTempC()*. Your program should use the Main() method listed below without modification >

```
static void Main(String[ ] args)
{
    double fahrTemp, celTemp;
    Console.WriteLine("Enter a temperature in degrees F >");
    fahrTemp = double.Parse( Console.ReadLine() );
    celTemp = calcTempC( fahrTemp );
    displayTempC( celTemp );
}
```

Note that calcTempC and displayTempC are called *without* their class name (eg **displayTempC()** instead of **Classname.displayTempC()** – either is acceptable but omission of the class name will only be valid if the method is called from within the same class it is defined, as would be this case.

DEMO EXERCISE 1 TO TUTOR

2. This exercise requires you to use methods of the standard library Math class. Any variable passed or returned from a Math class method is usually of type double. A right-angled triangle has the property;

$$\text{hypotenuse} = [\text{opposite}^2 + \text{adjacent}^2]^{0.5}$$

Another property for a right-angled triangle is that for an acute angle the ratio of the opposite-to-adjacent lengths is the tangent of the angle;

$$\text{Tan}\theta = \text{opposite} / \text{adjacent}$$

Write a program that>

- a) asks the user to input one of the acute angles in degrees (**inputangle**) and
- b) asks the user to input the length (in cms) of the corresponding adjacent side (**inputlength**).
- c) the program should then calculate the remaining two sides of the triangle (opposite and hypotenuse).

NB Math class methods that use angles usually must be in units of radians *not* degrees. Perform the calculation in the following stages;

- i) **angleinradians = inputangle/57.3**
- ii) use Math class method **Tan(angleinradians)** to return the **tangent** of the angle
- iii) calculate the opposite length which will be **tangent x inputlength**
- iv) calculate the hypotenuse length using Math class method **Sqrt(z)** where z is the sum of the squares of the adjacent (input) length and the opposite length.

To test, an acute angle of 53.13° with an adjacent side of 3cms should equate with an opposite length of 4cms and a hypotenuse of 5cms (excluding a tiny error) i.e. a 3:4:5 triangle.