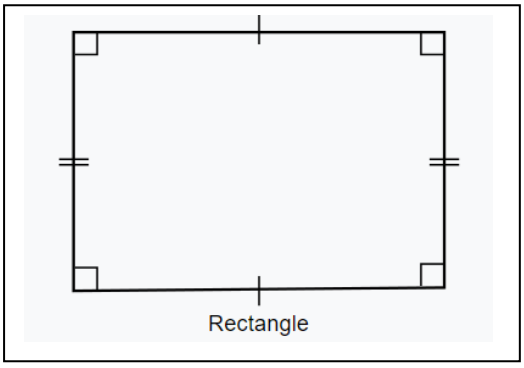
Contents

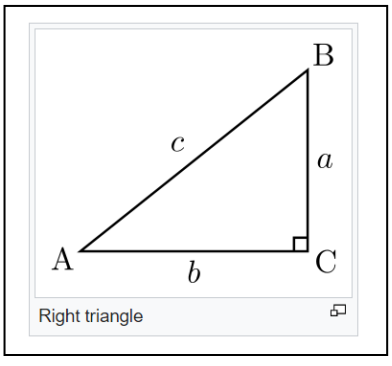
F# Domain Modeling – Data type declarations

You In this exercise, we are going to represent two geometrical shapes as shown below and do something with it. You are going to represent rectangles and right triangles. Below are links if you want to refresh your knowledge in geometry.

https://en.wikipedia.org/wiki/Right_triangle

https://en.wikipedia.org/wiki/Rectangle





Note that two numbers can characterize these two shapes. Use float type.

3.1 – Data type and function declaration

a. Define the data type declaration (PclShape) for Rectangle and RightTriangle
b. Create some values to represent both shapes

c. Define a function `pclArea : PclShape -> float` that calculates the area of a shape.
d. Define a function pclPerimeter to calculate the perimeter of a rectangle.
e. Redefine the PclShape to use records instead of tuples (PclShapeRecord).

4.1 – Record data type

Redefine the **pclArea** function (defined in 3.1 above) to use the new data type (PclShapeR 4.1e). Call the new function pclAreaWithRecord.

4.2 – Tail recursive function

Redefine the fibonacci function (defined in Exercise 2.3.2) as a tail recursive function.

4.3 – Continuation function

Redefine the accumulator based factorial function from today's lesson to use continuations.

4.4 – Leap year function

A year y is a leap-year iff y is divisible by 400 or if it is divisible by 4 and not divisible by 100.
Define a function isLeapYear : int -> bool that takes a year y and tells us if y is a leap-year.
For example, 1992 and 2024 are both leap-years; 1901 and 2023 are both not leap-years.

4.5 – Course Project - Sprint 1

Finish up Sprint 1 of the case work.