A standard operator on vectors is the dot product, defined as follows. Let \( \mathbf{u} = (u_1, u_2, \ldots, u_n) \) and \( \mathbf{v} = (v_1, v_2, \ldots, v_n) \) be two vectors of length \( n \). Define the dot product \( \mathbf{u} \cdot \mathbf{v} \) to be the scalar

\[
\mathbf{u} \cdot \mathbf{v} = u_1v_1 + u_2v_2 + \cdots + u_nv_n = \sum_{i=1}^{n} u_iv_i.
\]

The dot product has many uses. For example, it is easy to show that the cosine of the angle \( \theta \) between the vectors \( \mathbf{u} \) and \( \mathbf{v} \) is

\[
\cos \theta = \frac{\mathbf{u} \cdot \mathbf{v}}{||\mathbf{u}|| ||\mathbf{v}||}.
\]

As a consequence of this equation, the angle between \( \mathbf{u} \) and \( \mathbf{v} \) is a right angle if \( \mathbf{u} \cdot \mathbf{v} = 0 \), an acute angle if \( \mathbf{u} \cdot \mathbf{v} > 0 \), and an obtuse angle if \( \mathbf{u} \cdot \mathbf{v} < 0 \). This fact is extremely useful in computer graphics.

In the Vectr template class, implement the dot product as \texttt{operator*()}\). Then write a program named \texttt{Triangles.cpp} that will read the three vertices of a triangle as Point2Ds and determine whether the triangle is a right triangle, an acute triangle, or an obtuse triangle. Recall that a right triangle is a triangle in which one angle is a right angle, an acute triangle is a triangle in which all three angles are acute, and an obtuse triangle is a triangle in which one angle is obtuse.

The program should output one of the phrases “Right triangle,” “Acute triangle,” or “Obtuse triangle.”

Place the files \texttt{vectr.h} and \texttt{Triangles.cpp} in a folder named \texttt{Lab 06} and drag it to the dropbox.