1-2. **Write a C++ class** which contains a measurement in two dimensional space (x, y). Add member functions to return the value of the x and y coordinates, the error matrix ($M = \begin{pmatrix} \sigma_x^2 & \sigma_{xy} \\ \sigma_{xy} & \sigma_y^2 \end{pmatrix}$, σ's are the variances and the covariances), the distance $r = \sqrt{x^2 + y^2}$, its error and the significance $S = \frac{r}{error}$. **Compile the code into a library.** Write a test program to **test that the library works**.

Here the measurement is a single measurement, and the error matrix is coming from a separate measurement. So you need to be able to fill the error matrix with some values, not coming from this measurement, but from the separate one. We just use the results from the separate measurement to estimate the uncertainty of our single measurement. A real world example of such a 2D measurement is the closest distance of a track to the primary vertex, which is called an 'impact parameter'.

Please push your results into your public git repository.