1-2. **Write a class** for a reconstructed track with datafields for 4-momentum, and member functions for returning the relevant information including the transverse momentum (i.e. p_T, momentum in the x,y-plane) and pseudorapidity $\eta = -\log \tan \frac{\theta}{2}$ (θ is the polar angle i.e. the angle between the momentum 3-vector $\bar{p}$ and the z-axis).

In simulations, one knows the underlying Monte Carlo truth: whether the track is created by e.g. an electron or a pion. **Write a new class for simulated particles by inheriting the track class** and adding datafields for particle id and parent partile id.

In all classes use a scope which hides the actual data.

Write a test program to check that your code works.

Please push your results into your public git repository.