Assignment 3
Due Thurs Mar 4

1. Numerically solve the ordinary differential equation :

$$\frac{dy}{dx} = -\cos x$$

in Fortran, C, or C++.

For each of the following parts you need to extend your solution for 10 cycles. Compare your solution to the analytic solution? Make sure to plot residuals as well as a comparison plot. How well is the amplitude maintained (again residuals).

(a) (50 points) Use the Euler method presented in class.

(b) (50 points) Use the Euler Predictor corrector method presented in class.

(c) (75 points) Use ODEINT from numerical recipes in your language, if using fortran use my example and the routines in /work/ouastr5900/fortran/BS_example.

(d) (50 points) Discuss your results in Parts (a)-(c). Is one method clearly better: in accuracy? In ease of coding?