1. Calculate $\sin(x)$ by calculating first 10, 100, 10000 terms of the formula

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} \dots \tag{1}$$

   Are you able to sum first 10,000 terms? If you get an overflow error, think about how to avoid it.

2. Solve the differential equation

$$\frac{dx}{dt} = f(x,t) \tag{2}$$

   for three forms of $f(x,t) = \sin x, t\cos(x), x^2$. Initially at $t = 0, x = 1.0$. Get the data in a file. Use any software for plotting such as MS excel, origin, xmgrace etc. If you can solve it by hand, compare your answer with numerical result.