

ZCE 111  
Assignment 5

# Q1. Fitting a blackbody radiation data set to retrieve its corresponding temperature

- The data from the measurement of the radiance,  $R$ , vs wavelength,  $\lambda$ , both in S.I. unit, at an unknown temperature can be download from `blackbody.dat`  
Design a merit function so that you can minimise it to determine the temperature at which the radiance data was measured.

## Q2. Finding initial launching angle and speed of a 2D projectile.

The  $(x,y)$  coordinates of a projectile launched at  $(0,0)$  with unknown initial speed and angle can be download from

[http://comsics.usm.my/tlyoon/teaching/ZCE111\\_1516SEM2/data/projectile\\_unknown\\_initial\\_values.dat](http://comsics.usm.my/tlyoon/teaching/ZCE111_1516SEM2/data/projectile_unknown_initial_values.dat)

Write a code to determine the initial speed  $v_0$  and launching angle  $\theta$ .

# Q3. Finding the best slope and intercept of a linear data.

Download the data set `linear_fit.dat`. It is a set of data points that are approximately related via a linear relation  $y = a + bx$ .

Using whatever method you can think of to decipher the values for  $a$  and  $b$  that best fit the data set.