

### Worksheet Nine

*The history of every major Galactic Civilization tends to pass through three distinct and recognizable phases, those of survival, Inquiry and Sophistication, otherwise known as the How, Why and Where phases. For instance, the first phase is characterised by the question How do we eat? the second by the question Why do we eat and the third by the question Where shall we have lunch?*

Douglas Adams, The Hitch Hikers Guide to the Galaxy 1979

#### Unit Learning Outcomes Addressed by this worksheet: 1, 2, 3 & 4

Make electronic copies of all of your algorithms. Place these, along with your Java code, in your P08 directory.

#### Exercise One

Design an algorithm which uses the classes developed in worksheets 7, 8 (or 9) to perform the task below. The algorithm should:

- Input the details of a starting point star portal.
- Input the details of a destination portal.
- Calculate and output the total required travel time (in days, hours and minutes) to travel from one portal to the next.

To calculate travel time between portals you must use the equation below:

$$mins = \frac{dist}{(s_1 + s_2)} \quad (1)$$

where:

- dist is the distance (in km) between two stars.
- $s_1$  is the Slartibartfarst Coefficient for the starting star portal and
- $s_2$  is the Slartibartfarst Coefficient for the destination star portal.

The formula for calculating the distance between two points in a 3D cartesian coordinate system is given by:

$$dist = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2} \quad (2)$$

You will need to figure out how to apply this formula to two DistanceClass objects.

#### Exercise Two

Finally, translate your algorithm into Java and compile and run your application.