SE 2A04 Fall 2002

Lab Exercise 1

Instructor: William M. Farmer

Assigned:	13 September 2002
Demonstration due:	20 September 2002
Lab report due:	27 September 2002

The purpose of this lab exercise is to write and test a simple Oberon-2 module involving vectors.

Step 1

Write an Oberon-2 module named `Vectors` that includes a single procedure named `Compare` in its interface. `Compare` must satisfy the following specification: `Compare` takes four real number arguments x_1, y_1, x_2, y_2 as input. For $i = 1, 2$, (x_i, y_i) represents a two-dimensional vector v_i whose cartesian coordinates are x_i and y_i. `Compare` returns an integer i as output such that:

1. $i = 0$ if v_1 and v_2 are identical.
2. $i = 1$ if v_1 and v_2 are orthogonal.
3. $i = 2$ if v_1 and v_2 are collinear.
4. $i = 3$ if v_1 and v_2 are not identical, orthogonal, or collinear.

Step 2

Write an Oberon-2 module named `TestVectors` that "black box" tests the `Compare` procedure in the `Vectors` module. The `TestVectors` module should be able to test any `Compare` procedure that satisfies the specification given above.

Step 3

During the lab session on September 20, demonstrate your program— consisting of the two modules `Vectors` and `TestVectors`—to one of the TAs.

Step 4

Before or during the lab session on September 20 get a copy of the `Vectors` module written by your assigned partner. Test this module using your `TestVectors` module.

Step 5

Write a lab report that includes the following:

1. A copy of the Lab Exercise 1 Marking Scheme (which will be available on the course Web site) stapled to the front of your report.
2. A copy of your `Vectors` module and a brief explanation of its design.
3. A copy of your `TestVectors` module and a brief explanation of its design.
4. The results of the test of your `Vectors` module.
5. The results of the test of your partner's `Vectors` module.
6. A discussion of the test results and what you learned doing the lab exercise.
7. A discussion of any problems you found with the specification of the `Compare` procedure.
8. A copy of the part of your log book relevant to this lab exercise.

The lab report is due no later than the beginning of the tutorial session on September 27.

Notes:

1. Your program must work in the ITB labs when compiled by obc.
2. If your partner fails to provide you with a copy of his or her `Vectors` module by the end of the lab session on September 20, tell the instructor via e-mail as soon as possible.