**SOFT8023 – Distributed Systems Programming**

## **Assignment 2 Part 1**

**Worth:** 15% Due**:** End of Week 12

## Overview

Write an RMI-based application with 1 client and 2 server objects. You must use the RMI **callback** feature for one of the server objects and **polling** with the other (doesn’t matter which has which type of implementation).

The client is an alert system situated in a national forest. When humidity is low, the temperature is high and there is a very low level of cloud cover, the risk of a forest fire increases.

The 2 server objects are:

* A sensor that takes 1.5 seconds to get a reading for temperature and humidity
* A “cloud cover” remote service that looks up the meteorological service to get a percentage cloud cover for the current hour; it takes 3 seconds to calculate the percentage

The risk is calculated as temperature (Celsius) x (100 - Humidity %) x (100 - Cloud Cover %). For example, if the sensor returned temp of 28C and humidity of 15%, and the met service returned cloud cover of 18%, then this would be 28 x (1 – 0.15) x (1 – 0.18) = 19.516. If the risk score is greater than 20, you must raise an alarm (a message to the console is enough).

You should check the risk once every 10 seconds. Based on the response times of the 2 remote objects, it should take about 3 seconds to calculate the response, which is well within the 10 seconds per risk assessment.

In the service classes, simulate readings using random numbers – just restrict the random number ranges so that an alert will usually be raised within a minute.

Sample output (with 10 seconds between lines, number of lines will vary):

Checking… no risk  
Checking… no risk  
Checking… no risk  
Checking… risk detected (21.312)!!!