**Fun Day**

**Programming Contest**

Tools and Technologies: ICOM4015 Materials such as Java, Threads, GUI, OOP, I/O

Once upon a time, the earth was covered all with water. There was only one small habitable area known as the Island. People living in the Island called Islanders.

The objective of this project is to simulate the life of Islanders based on the following specifications. Notice that the project is required to be fully parametric and read all configurations from a text file with the specified format.

The Island area can vary from 1,000 m2 to 10,000 m2 (area) due to tides and other natural environment changes. Initially the number of islanders is 25 male and 25 females (male#, female#) and it can grow or shrink due to reproduction and death rates. If the population of the Islanders grows so big such that they cannot clearly be shown visually on the screen, the island will sink in the water and life ends. [Note: for clear animation, an Islander needs **minimum** 30 pixels to be visualized; it normally needs between 150-200 pixels though; and, if the Island is big enough and the population is small enough, an Islander may be shown with maximum 350 pixels.]

Islanders’ life expectancy is normally 90 years (lifeLength). Their life has 3 stages: Childhood; Adulthood, and Old-hood. The childhood stage is the first 25 years (childhoodLength), the adulthood is 40 years (adulthoodLength), and the old-hood is 25 years (oldhoodLength).

==== Reproduction Rates =============

A female and a male islander can mate and produce children.

80% of Islanders will produce 0 children in their childhood (childhoodReproduction, producedChildren). 10% of Islanders will produce 1 child in their childhood (childhoodReproduction, producedChildren). 5% of Islanders will produce 2 children in their childhood (childhoodReproduction, producedChildren). 5% of Islanders will produce 3 children in their childhood (childhoodReproduction, producedChildren).

Similarly, 70% of Islanders will produce 2 children in their adulthood (adulthoodReproduction, producedChildren). 10% of Islanders will produce 2 children in their adulthood (adulthoodReproduction, producedChildren). 20% of Islanders will produce 0 children in their adulthood (adulthoodReproduction, producedChildren).

And, 20% of Islanders will produce 1 child in their old-hood (oldhoodReproduction, producedChildren). 80% of Islanders will produce 0 children in their old-hood (oldhoodReproduction, producedChildren).

==== Death Rates ====================

Some islanders may have a sudden death any time in their life, due to accidents, diseases, crimes, etc. The assumption is that sudden deaths will always occur after reproduction.

10% of the Islanders will have a sudden death in their childhood. 5% of the Islanders will have a sudden death in their adulthood; and, 10%

In addition,

Every 10 years, there is a natural disaster in the island. The natural disasters normally have no casualties. However, every 50 years, there is a strong natural disaster that randomly kills 10% of the populations (4% from children, 4% from elderly, and 2% from adults)

Islanders are in one of the following 4 places:

* House

There are 4 types of house:

* + Apartment
  + Bungalow
  + Residence
  + Townhouse
* Work

There are 4 types of work:

* + OfficeWork
  + LaborWork
  + MoneyWork
  + OtherWork
* Play

There are 4 types of entertainment:

* + Sports
  + Nature
  + Eating
  + OtherFun
* SomewhereElse

There are 4 different other places:

* + SW1
  + SW2
  + SW3
  + SW4

A Sample of Input Text File:

Area: 10000 [1,000-10,000]

Initial Female#: 25 [1-100]

Initial Male#: 25 [1-100]

Life Length: 90 [40-100]

Childhood Length: 25 [10-30]

Adulthood Length: 40 [20-50]

Old-hood Length: 25 [10-30]

Total Childhood Reproduction Rate: 0.35

Childhood Reproduction1: 0.8 0

Childhood Reproduction 2: 0.1 1

Childhood Reproduction 3: 0.05 2

Childhood Reproduction 4: 0.05 3

[Prerequisite 1: R1+R2+ …+RN=1]

[Prerequisite 2: Total= R1 \* num1 + R2 \* num2 + …+RN\*numN]

Total Adulthood Reproduction Rate: 1.6

Adulthood Reproduction1: 0.7 2

Adulthood Reproduction 2: 0.1 3

Adulthood Reproduction 3: 0.2 0

[Prerequisite 1: R1+R2+ …+RN=1]

[Prerequisite 2: Total= R1 \* num1 + R2 \* num2 + …+RN\*numN]

Total Oldhood Reproduction Rate: 0.2

Oldhood Reproduction1: 0.2 1

Oldhood Reproduction 2: 0.8 0

[Prerequisite 1: R1+R2+ …+RN=1]

[Prerequisite 2: Total= R1 \* num1 + R2 \* num2 + …+RN\*numN]

Sudden childhood death: 0.10

Sudden adulthood death: 0.08

Disaster

Sudden Death Rate: some of the above

Unemployment rate: 0.20

Resting Time: 8

Working Time: 8

Other (Playing or somewherelse) Time: 8

Some of these should add up to 24

House possibility : HP

Work