Problem Solving in IT (COMP1001)

Individual Class Project (v.1.0)
(Due at noon on 4 December 2018)

Rocky K. C. Chang

19 October 2018

Objective:
You will have experienced the entire problem-solving process through designing and implementing a program to solve the couple river-crossing problem described in
https://www.youtube.com/watch?v=dgDnwD4ieWM.

The Project:
In this project you will design and implement a program to solve the problem. You must apply and document the three-step process: data abstraction, algorithm design and coding. For the last step, you must modularize your code by identifying the functions that you need and their signatures.

Your program should print the solution in the format below. Note that it is just one of the solutions.

```
1 The blue husband and blue wife go from the east to the west.
2 The blue husband goes from the west to the east.
3 The green wife and red wife go from the east to the west.
4 The green wife goes from the west to the east.
5 The red husband and blue husband go from the east to the west.
6 The red husband and red wife go from the west to the east.
7 The green husband and red husband go from the east to the west.
8 The blue wife goes from the west to the east.
9 The red wife and blue wife go from the east to the west.
10 The green husband goes from the west to the east.
11 The green husband and green wife go from the east to the west.
```

Deliverables:
1. A report documenting the process of solving the problem
   a. Two pages maximum. One inch on all margins and Times New Roman font with 11pt and single space.
   b. The report must contain the following information and sections. There is no need to include the code, because it is already in the .py file.
      i. Your name, student ID and program name
      ii. Problem description
      iii. Data abstraction (including description of the states, a graph as a result of the data abstraction, the data types required, …)
      iv. The algorithm needed to solve the graph problem
      v. A modular design of the program
      vi. Python implementation of the data types
2. A well documented Python program in a single .py file
   a. You must use docstring to describe each function.
   b. By using appropriate comments and variable names, your program must be easy to follow and understand.
   c. Give proper reference to the source of the code that you adopt for your program.

Assessment Criteria: (I am still working on this part.)

Your project will be assessed based on the following criteria. Each criterion (a), (c)-(d) will be given *A* (clearly above the expectation), *B* (meeting the expectation), *C* (not up to the expectation yet, but not too far from it), or *D* (way below the expectation). For criterion (b), correct result will receive *A* and incorrect one will receive *D*. The final grade will be the average of the five criteria.

    a. Implementation quality (20%): The program should not contain bugs, and the code is well structured and documented.

    b. Accuracy of the result (20%): The result is correct.

    c. Program modularization (20%): The program is reasonably modularized.

    d. Algorithm design (20%): The algorithm designed for each function is correct and efficient.

    e. Data abstraction (20%): The data abstraction is done in a clear and logical manner.