Problem Solving in IT (COMP1001)

Individual Class Project v0.2
(Due at noon on 6 December 2017)

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Objective:
You will have experienced the entire problem-solving process through designing and implementing a program to solve the Man-Cabbage-Goat-Wolf (MCGW) problem.

The Project:
In this project you will design and implement a program to solve the MCGW 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 following to the screen.

```
1. The man takes the goat to the west.
2. The man takes himself to the east.
…
6. The man takes himself to the east.
7. The man takes the goat to the west.
```

As you know, there are two equally good solutions to this problem. Your result could be any one of them.

Deliverables:
1. Documentation of the data abstraction, algorithm design, and coding (2 pages max)
2. A documented program in a single .py file

Other requirements:
1. You must use the function `genStates()` in A5. If you have strong reasons for not using it, please send your reasons to me.

Assessment Criteria:
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.

Bonus:
After finishing the above, you may want to challenge yourself to attempt additional tasks below as a bonus:
1. You program can print out both solutions at the same time (at most an additional of 5% of the marks you receive from the above).

2. A program that use the states that do not have the man. There are 8 states for this new data abstraction (at most an additional of 15% of the marks you receive from the above).