

# CS118 Programming Assignment

## The Game of M

In the Game of M, there is an array with 10 empty elements. Two players take turns inserting a number in the range of 0 through 9 into the array at any empty location. Each player can choose any remaining number, but each number can only be used once. The game is over when all elements in the array are filled. Scoring is performed – see the last paragraph.

Your program must maintain a list for the game board and alternate turns for the players - use a loop to repeat the taking of turns. Before each insertion, show the game board as shown below. (HINT: Use a “dummy” value – any otherwise meaningless value - in the list to represent an “empty” location) Validate each player's choice of number to insert, and location for the insertion. If the number has already been used or the insertion location is not empty, have the player provide new values for both until they are both valid. Be sure to provide an error message indicating the specific problem.

```
Position: 1 2 3 4 5 6 7 8 9 10
          | | | | | | | | | |
          | | | | | | | | | |

Player 1: Your number? 7
Position to insert at? 9
Position: 1 2 3 4 5 6 7 8 9 10
          | | | | | | | | 7 | |

Player 2: Your number? 1
Position to insert at? 10
Position: 1 2 3 4 5 6 7 8 9 10
          | | | | | | | | 7 | 1 |

Player 1: Your number? 0
Position to insert at? 3
Position: 1 2 3 4 5 6 7 8 9 10
          | | 0 | | | | | | 7 | 1 |
```

Scoring is that the player gets one point for inserting a number. If the element in which the number is inserted sits next to an element already containing a number and that neighboring number is an integer multiple of the inserted number (or the inserted number is an integer multiple of the neighboring number) the player gets another point. This applies to a neighboring element on the other side, too, so it's possible that a player can get up to three points in a single insertion. Note that 0 is a multiple of all integers, and all integers are multiples of 1.

Maintain the score as each player inserts, and display the score before each display of the board and when the game ends.

```
Score: 1 to 2

Position: 1 2 3 4 5 6 7 8 9 10
          | 6 | 3 | | | | | | | |

Player 1: Your number? 9
Position to insert at? 4

Score: 2 to 2

Position: 1 2 3 4 5 6 7 8 9 10
          | 6 | 3 | | 9 | | | | | |

Player 2: Your number? 1
Position to insert at? 3

Score: 2 to 5

Position: 1 2 3 4 5 6 7 8 9 10
          | 6 | 3 | 1 | 9 | | | | | |
```