

## Programming Project 03

This assignment is worth 30 points and must be **completed and turned in before 11:59 on Monday, September 28, 2009.**

### Assignment Overview

This assignment will give you more experience on the use of both loops and if statements. You are going to write a program that asks the user for two numbers to create and print a Latin Square.

### Background

A Latin Square is an  $n \times n$  table filled with  $n$  different symbols in such a way that each symbol occurs exactly once in each row and exactly once in each column (see

[http://en.wikipedia.org/wiki/Latin\\_square](http://en.wikipedia.org/wiki/Latin_square) ). For example, two possible Latin Squares of order 6:

1 2 3 4 5 6	3 4 5 6 1 2
2 3 4 5 6 1	4 5 6 1 2 3
3 4 5 6 1 2	5 6 1 2 3 4
4 5 6 1 2 3	6 1 2 3 4 5
5 6 1 2 3 4	1 2 3 4 5 6
6 1 2 3 4 5	2 3 4 5 6 1

Obviously, the top-left numbers are 1 and 3 respectively.

### Project Description / Specification

Your program will ask user to input two numbers. The first number is the order of square; the second one is the top-left number of the square. Note that the second number should be between 1 and the first number, so your program should check this situation. Then, your program will print the corresponding Latin Square. Here is some example output:

```

Python Shell
>>>
Please input the order of square: 8
Please input the top left number:1
The Latin Square is:
1 2 3 4 5 6 7 8
2 3 4 5 6 7 8 1
3 4 5 6 7 8 1 2
4 5 6 7 8 1 2 3
5 6 7 8 1 2 3 4
6 7 8 1 2 3 4 5
7 8 1 2 3 4 5 6
8 1 2 3 4 5 6 7
>>> ===== RESTART =====
>>>
Please input the order of square: 5
Please input the top left number:3
The Latin Square is:
3 4 5 1 2
4 5 1 2 3
5 1 2 3 4
1 2 3 4 5
2 3 4 5 1
>>>
Ln: 49 Col: 4

```

## Deliverables

**proj03.py** -- your source code solution (remember to include your section, the date, project number and comments).

1. Please be sure to use the specified file name, i.e. "**proj03.py**"
2. Save a copy of your file in your CS account disk space (H drive on CS computers).
3. Electronically submit a copy of the file.

## Getting Started

Break the problem down into smaller parts. For example:

1. The **range** function and the **%** (modulus) operator are both useful for this project.
2. Can you generate a sequence beginning with 1 of the appropriate order? A sequence of order 5 would be **1 2 3 4 5**
3. Can you generate a sequence of the appropriate order beginning with a number other than 1? For a sequence of order 5 starting with 3 would be **3 4 5 1 2**
4. Can you generate the second in the Latin sequence? For example, starting with **1 2 3 4** the next sequence would be **2 3 4 1**