

School of Computer Science, University of Windsor
60-140: Introduction to Algorithms and Programming I
Term: Intersession 2016 (May-June)
Instructor: Dr. Asish Mukhopadhyay

Assignment 5

Posted: 05 June, 2016

Due: 15 June, 2016, 11:59pm

Preamble: This assignment covers Chapter 9 of your course text.

Grading Scheme: The problem is worth 10 points: 6 for correctness, 2 for effort and 2 for documentation (comments and programming style). Upload your solution on BLACKBOARD on before the due date. The submission should have your name and student ID on it.

Problem 1 Implement in C the Programming Project 5 from the Programming Projects section of Chapter 9 of your text-book, C-programming by K. N. King. The problem is this.

Given an odd number n , an $n \times n$ magic square is an arrangement of the numbers $1, 2, \dots, n^2$ such that the sum of the entries in any row, column or diagonal is the same. The user specifies n . Here is a sample interactive session:

```
This program creates a magic square of a specified size.  
The size must be an odd number between 1 and 99.  
Enter size of magic square: 5
```

```
17  24  1  8  15  
23  5  7  14 16  
4   6 13 20 22  
10 12 19 21 3  
11 18 25 2 9
```

As you can easily verify, the sum of the entries in any row, column or diagonal in the above matrix is 65. Write two functions:

```
void create_magic_square(int n, char magic_square[n][n]);
```

and

```
void print_magic_square(int n, char magic_square[n][n]);
```

that are called from `main` to create respectively a magic square and then to print it as shown in the sample interactive session above.

Use `magic_square[99][99]` as the second parameter of your functions if your compiler dose not permit variable-length arrays.