CS 121 **Programming Assignment #1**
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January 14, 2018 **Due:** January 18, 2018

Objective: Design a program to read and store image data stored in hexadecimal form.

Recall from CS 120 that top-down design is a problem-solving method in which the programmer breaks a problem up into its major subproblems and then solves the subproblems using techniques such as stepwise-refinement to derive the solution to the original problem. All subproblems should translate *directly* into functions used by the final program.

Program Description: The program will read in a file containing the number of rows and columns stored in the file (one line), followed by one row of data per line. The data is stored in hexadecimal form.

Requirements: Your program (modular) must perform the following operations:

- Read (store) the image data file.
- Allocate image array dynamically.
- Write the image in binary (1s and 0s) to another file.

Sample:

Input:

```
8 2
0x0  0x0
0x1  0x8
0x3  0xc
0x7  0xe
0x7  0xE
0x3  0xC
0x1  0x8
0x0  0x0
```

Output:

```
00000000
00011000
00111100
01111110
01111110
00111100
00011000
00000000
```

Suggestions:

- Design your program.
- Revise your design as necessary.
- Start with a small program initially (e.g., the program above).
- Think!

Deliverables:

A complete *program design* to perform program parsing as described above. Your design (not handwritten!) should describe *all* functions and data structures that you think will be required to implement this program.

Estimate how long you think it will take you to implement this program.