Northwestern University
EECS 205 Winter 2019
Assignment 1: Stars

Due: Thursday January 17, 2019 at 5:0880pm (submit via Canvas)

This quarter you will implement a single player action-oriented video game in IA32 assembly language. The programming assignments will require you to build small modules of the game including graphics, game play, and sound which will all be put together by the end of the quarter. This and all the remaining assignments are to be completed independently.

Because the programming assignments build on each other, you will need completed code from the previous assignment before beginning the subsequent one. To avoid having you fall into a hole if you fail to complete an assignment, the course staff will work with you to get you up to speed, but it is your responsibility to contact us if you are having difficulty. **We will not hand out solutions for any of the assignments!**

For the first three assignments you will be implementing fairly generic game components. For the remaining two assignments you will be able to make several important design choices and give your game some personality. The assignments will become progressively more challenging, but we believe that everyone is capable of finishing this quarter with working games. The first assignment is meant to introduce you to the development tools and compilation process. It will be uncharacteristically easy. The remaining assignments will be considerably more difficult. For this assignment you will create a starfield, the background for your game. This has a few potential uses going forward: (i) field of play for game set in space (ii) night time background in a platform game.

Setting Up The Tool Chain

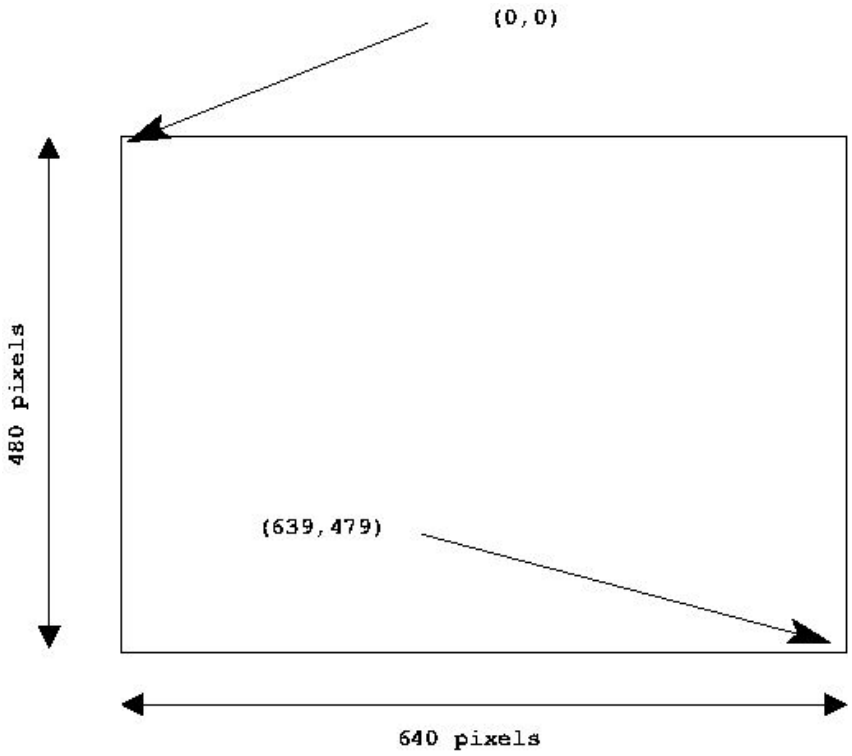
The hardest part of this assignment will be downloading and installing the tools! Seriously! Actually, the programming part of this assignment is designed to be really easy. We're really trying to make sure that you have the tools downloaded and can get comfortable with the environment before the difficult stuff comes. See the links posted on Canvas for instructions on getting the tools.

Starfield

This assignment is super easy. You will be drawing some stars on a black background. You only need to understand the screen coordinate system and how to use the `invoke` directive -- that's it!

In this class, the graphics environment has a display size of 640x480 pixels. The upper left corner of the display is coordinate (0,0). The lower right corner is (639,479). Note: This

orientation differs from the conventional Cartesian coordinates that you probably first encountered in your high school geometry class. **You will draw at least a sixteen stars on the background in any pattern you wish, using the `DrawStar` library function that we will provide.** Be creative and have fun. You do NOT need to use loops or data structures. You can just draw the stars at hardcoded locations. This assignment is meant to be easy! Just make sure that you draw at least sixteen stars. You will place your code in a procedure called `DrawStarField`. We've provided a template for you. Just insert your code in the designated location.




```
DrawStarfield proto
```
Input Parameters: none
Description: Draws a series of stars on the screen. You will implement this procedure.

Library Routines

We will provide startup code and library routines to support your module. The code that you write should call the following library routine using the **`Invoke`** directive as discussed in class.

Library routine description follows:

```
DrawStar proto x:DWORD, y:DWORD
```
Input Parameters: x = x-coordinate, y = y-coordinate
Description: Draws a star on the screen at the specified location.

Note that you do not need to write a “main” function. Our library code does all the set up for you and calls DrawStarfield. You just have to implement DrawStarField.

Getting Started

We’ll assume that you have set up the assembler (MASM). Next download and unpack the assignment files from the courseweb page.
You should only need to modify two files:

- `stars.asm` -- Source code for the assignment. Place your code here.
- `make.bat` -- Build script (makefile). Read and fill it out as directed to get proper path.

Fill in your own code to draw your stars. You can compile and execute your program from the command line or with the included `make.bat` script. To use from the command line, enter the directory where your assignment 1 files are kept and type: `make`. If there are no errors, you may run your program by typing: `stars` You should also be able to click on the `make.bat` file in the Windows GUI.

Pay attention to error messages that appear during compilation/linking. In particular, one common problem that you may encounter is that the linker is unable to write the executable `stars.exe` because the file is already in use -- just kill any running copies of `stars.exe`.

When the program launches, you should see a black background and any stars that you have drawn. To exit the program, hit the Escape key.

Submit your assignment on canvas as a single file called `stars.asm`. You should implement the **`DrawStarfield`** routine as described above. Comment your code. Make sure that any code that you write for this assignment is in this file and that it correctly compiles using the standard `make.bat` file included with this assignment. Please clearly identify your name in the comments.

All programming assignments in this class are to be completed independently. No collaboration!