**About**

All needed files as long as sample images can be found in the Capstone2 project folder which is zipped and available for download on compsci02.snc.edu/csci460/2017/sheknp. Simply enter compsci02.snc.edu/csci460/2017/sheknp into your web browser’s URL bar and click on the “Code” button in the top navigation bar.

**Project Files:**

* MainForm.cs: This file is where all of the image bit manipulation happens. This file uses selectionWindow.cs in the cropping method.
* MainForm.Designer.cs: This file holds the automatic program generated code from adding buttons, picture boxes, timers, and labels.
* selectionWindow.cs: This file simply initializes a second form used by the MainForm to create a selection window for the cropping method.
* selectionWindow.Designer.cs: This file holds the auto program generated code.
* Program.cs: Initializes and calls the MainForm.

**Test/Scaffolding Files:**

Located in the Capstone2 project folder inside folder named TestFolder

* WriteText.txt: The text document which has the original binary string of the hidden image written to it.
* ReadText.txt: The text document which has the recovered binary string of the hidden image written to it to compare to the WriteText.txt file.
* WriteLength.txt: Holds the binary string of the length of the length of hidden image.

**Sample Image Files:**

Located in the Capstone2 project folder inside folder named Images

* Archer.png
* Bk.png
* Hideimage.png
* Holly.png
* Holly\_cat.png
* Rick&Morty.png

**Executable Application:**

Located in the Capstone2 project folder > bin > Debug > Capstone2.exe OR on website in the “Code” section labeled “Download Executable”

* Capstone2.exe

**How To**

**Hook up/ Install:**

 All needed files, including sample images, can be found in the Capstone2 project folder which is zipped and available for download on compsci02.snc.edu/csci460/2017/sheknp. Simply enter compsci02.snc.edu/csci460/2017/sheknp into your web browser’s URL bar and click on the “Code” button in the top navigation bar. Choose the “Download Executable” button and the .exe will automatically download onto your machine.

**Compile and Link:**

Enter compsci02.snc.edu/csci460/2017/sheknp into your web browser’s URL bar and click on the “Code” button in the top navigation bar. Choose the “Download Project Folder .Zip” button and the project solution folder will automatically download onto your machine. After the download completes, unzip the folder and go into the folder. Once inside the folder, click on the file “Capstone2 Solution”. Once the project opens up in Visual Studio, click Debug on the top navigation bar on VS and choose “Start Without Debugging”. Project will automatically compile, link, and execute.

**Initialization/ Operation/ Use:**

Once the application is open, the user must either upload a base image and an image to hide into the specified locations in the application, or they must upload an image with an image already embedded. If the user chooses to upload an image to the Image in an Image picture box location (lower left picture box) without another image embedded within, the application will still attempt to recover an image. User can only use a hidden image that is small enough to fit inside the base image. If the hidden image chosen is too large, the user is notified and allowed to crop the image and asked to save the newly cropped image. After the user chooses both a base image and an image to hide, they have the choice between two different hiding algorithms. Hiding algorithm 1 takes about 2 minutes to recover while hiding algorithm 2 recovers the image almost immediately (unless the user has cropped the image to hide, in which case it will take about a minute and a half to recover). Once the hidden image has successfully been embedded within the base image, the user is asked to save the image with another image embedded and this image shows up below the base image for the user to compare to the original. The user than selects the recover button and will be asked to save the recovered image once again. Upon saving the recovered image, the hidden image embedded within the base image pops up in the bottom right picture box.

**Exceptions:**

User can only use .png image files. Also, the image the user can hide must be small enough to fit within the base image. However, if the image is too big the user is notified and allowed to crop the image and resave it. User must either upload both a base image and an image to hide, or the user can upload an image with another image already embedded to recover the hidden image.