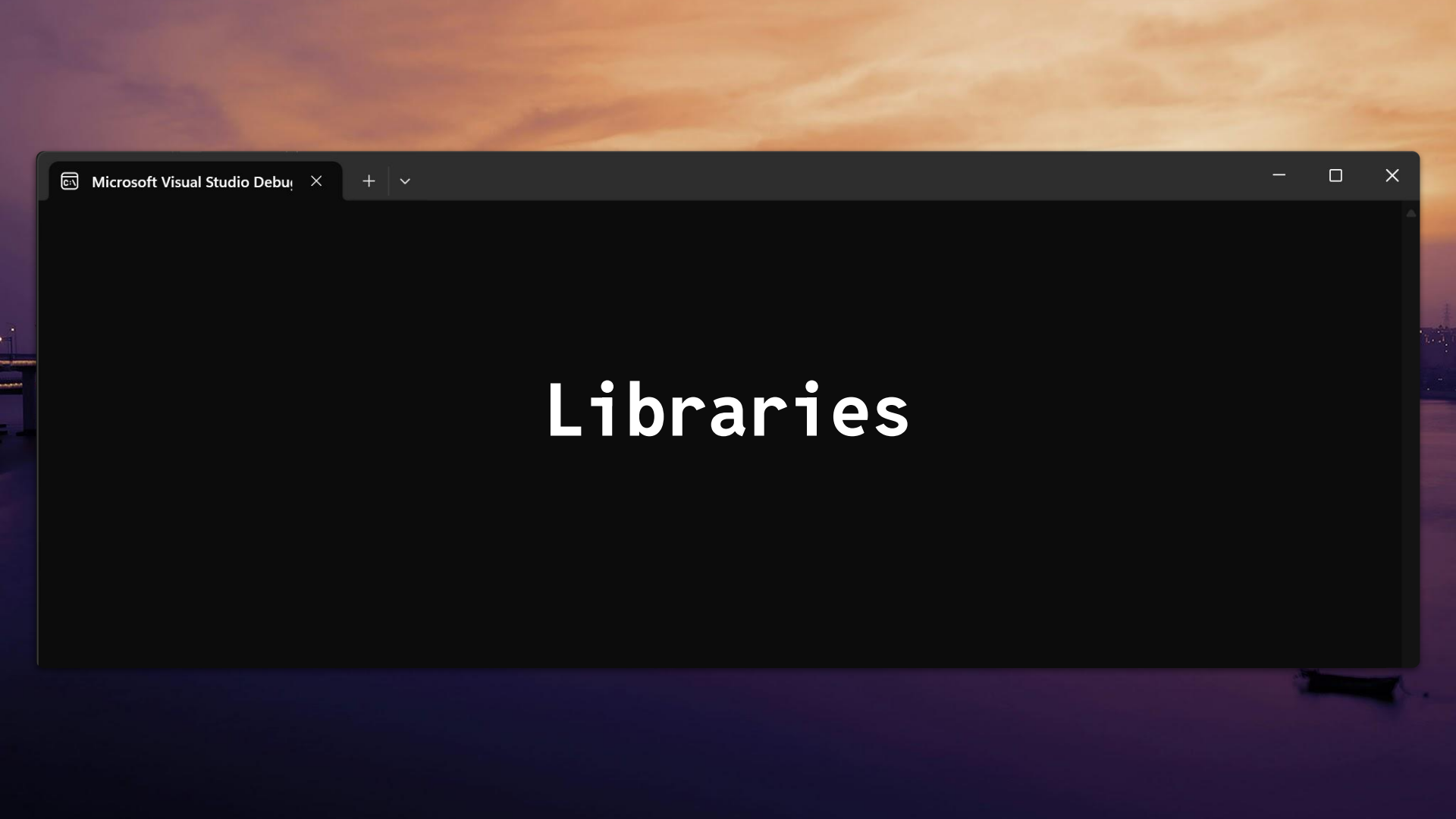

Microsoft Visual Studio Debu
I Hate Reading
Week 10
C:\Users\brend\source\repos\VGATestProject\x64\Release\VGATestProject.exe (process 70484) exited with code 0.
Press any key to close this window . . .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Libraries

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Libraries

Incorporate other people's code so you don't need to make it yourself!

Sounds simple. It's not, you'll hate it.

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```

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Technically

Any #include <> is accessing a library

But typically, you only care when it’s external (not part of the standard library)

- Often have namespaces.
- Standard library -> std::
- OpenCV library -> cv::

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Library Types

Static Library (LIB)

- Created once at compile time
- Incorporated directly into the final assembly
- Runs faster

NO DEPENDENCIES AFTER THE BUILD

Dynamically-Linked Library (DLL)

- Accessed at runtime
- Referenced but not present in the final assembly
- Runs slower
- Doesn’t need to recompile to update dependencies

Great with OS specific implementations, etc

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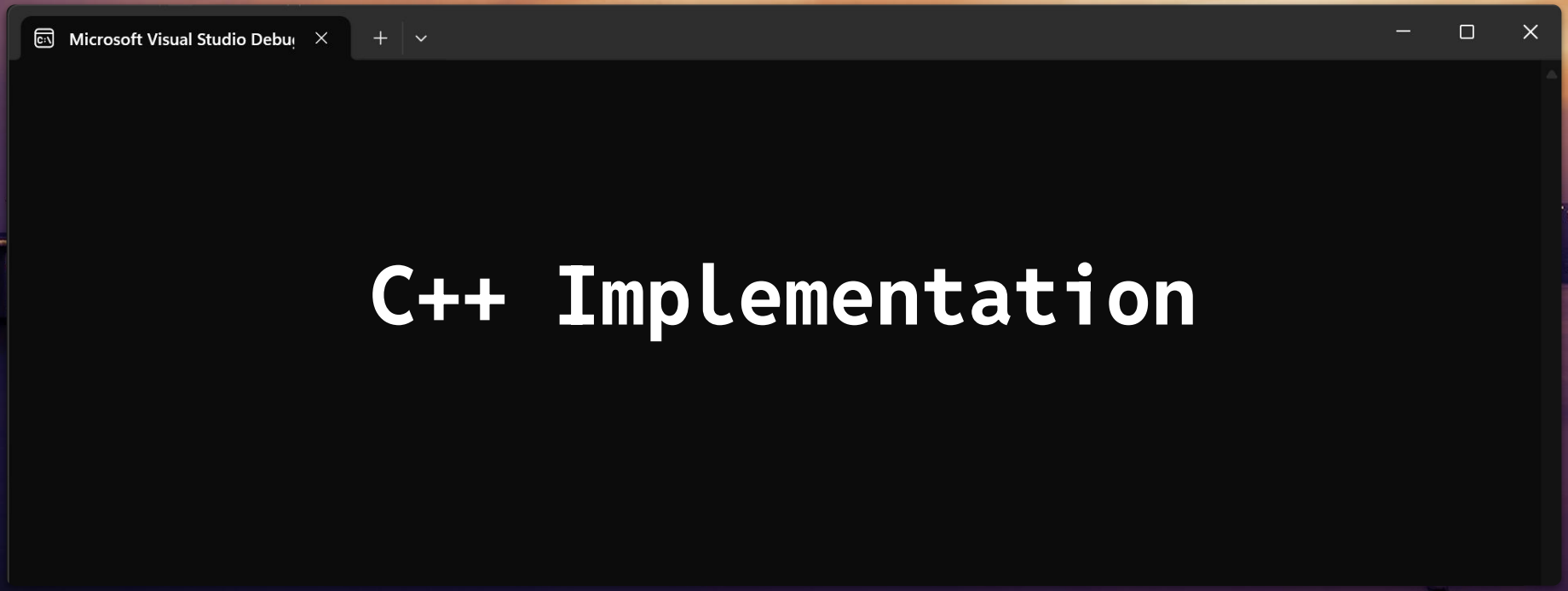
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C++ Implementation

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Linker

Tells the compiler where library files are located.

- Locates both Header and CPP Files
- Must know where the CPP files are and the names for #include
- Must be told the Header file locations separately

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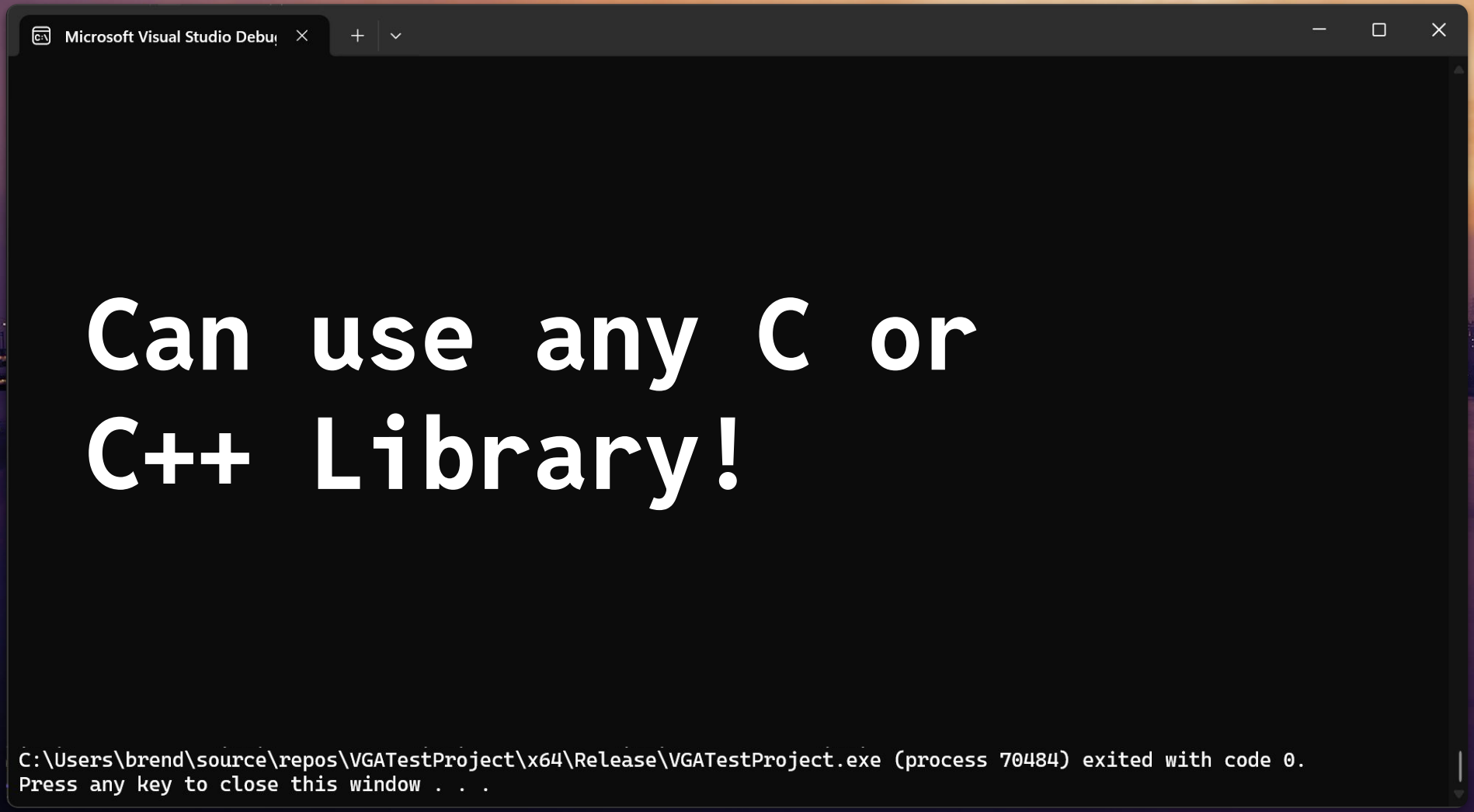
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Can use any C or
C++ Library!
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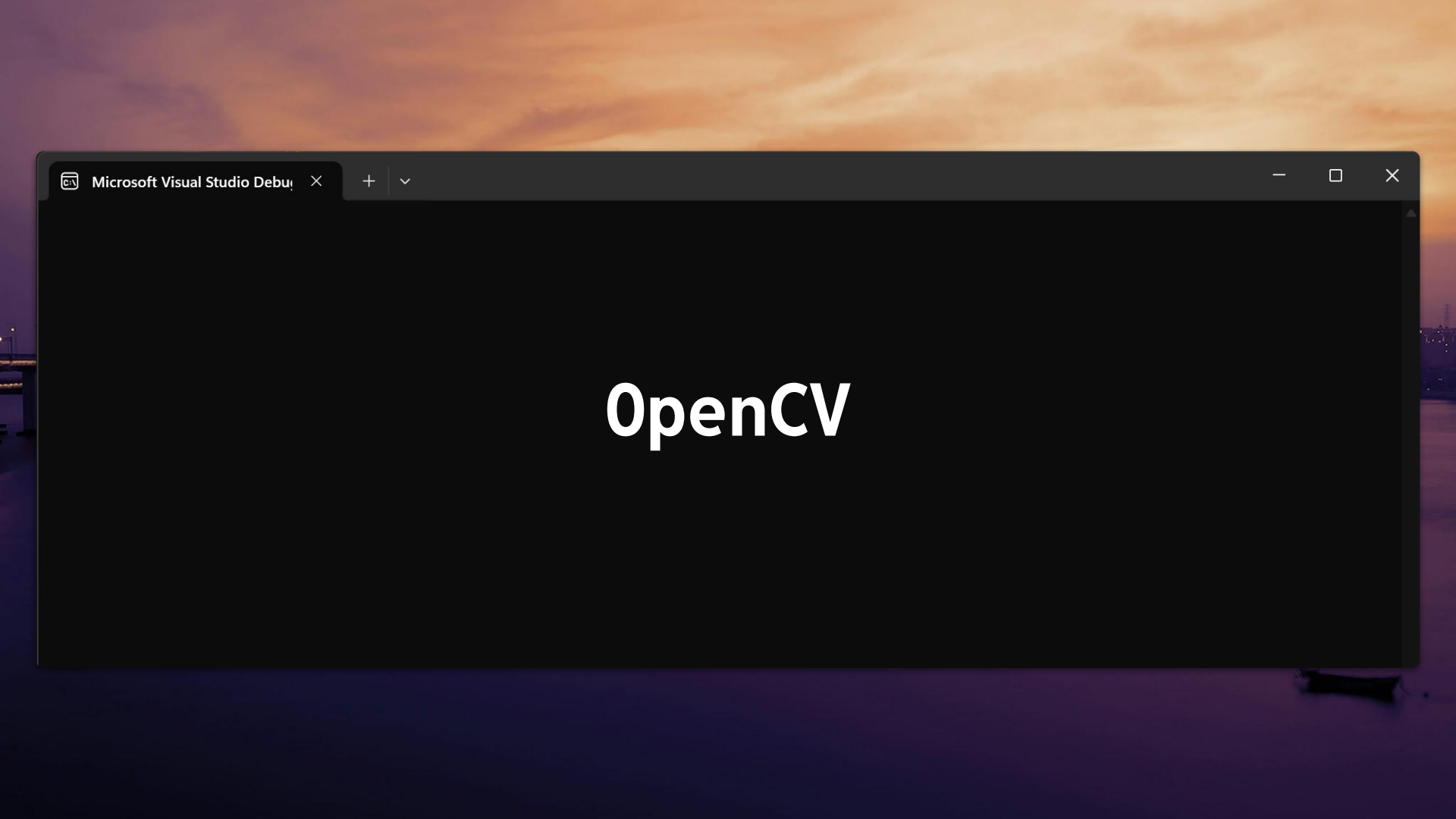
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OpenCV

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Overview

OpenCV is an Image Processing library

- Created in C, thus can be used with:
  - C, C++, Python, Java, etc
- Allows the import of image and video files, their conversion into usable arrays, and other processing techniques

https://github.com/opencv/opencv/releases/tag/4.11.0

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Using OpenCV

Objects

```
cv::Mat // Matrix (Typically stores an image)

cv::Vec3b // Length 3 Vector (Typically stores a color)

cv::Size // Length 2 Vector of Sizing Information
```

Commands

```
cv::imread(string filepath, cv::IMREAD_COLOR); // Reads Image From File

cv::resize(inputImage, outputImage, cv::Size(newW, newH), cv::INTER_LINEAR); // Resizes Image

cv::namedWindow("Display window", cv::WINDOW_AUTOSIZE); // Creates a Window

cv::imshow("Display window", image); // Displays Image in Window

image.at<cv::Vec3b>(row, col); // Gets Color at a location
```

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Test Code

```
#include <opencv2/core.hpp>
#include <opencv2/imgcodecs.hpp>
#include <opencv2/highgui.hpp>
#include "opencv2/highgui/highgui.hpp"


cv::Mat image = cv::imread(“img/test.png”, cv::IMREAD_COLOR)
cv::namedWindow("Display window", cv::WINDOW_AUTOSIZE);
cv::imshow("Display window", image);
cv::waitKey(0);
```

```
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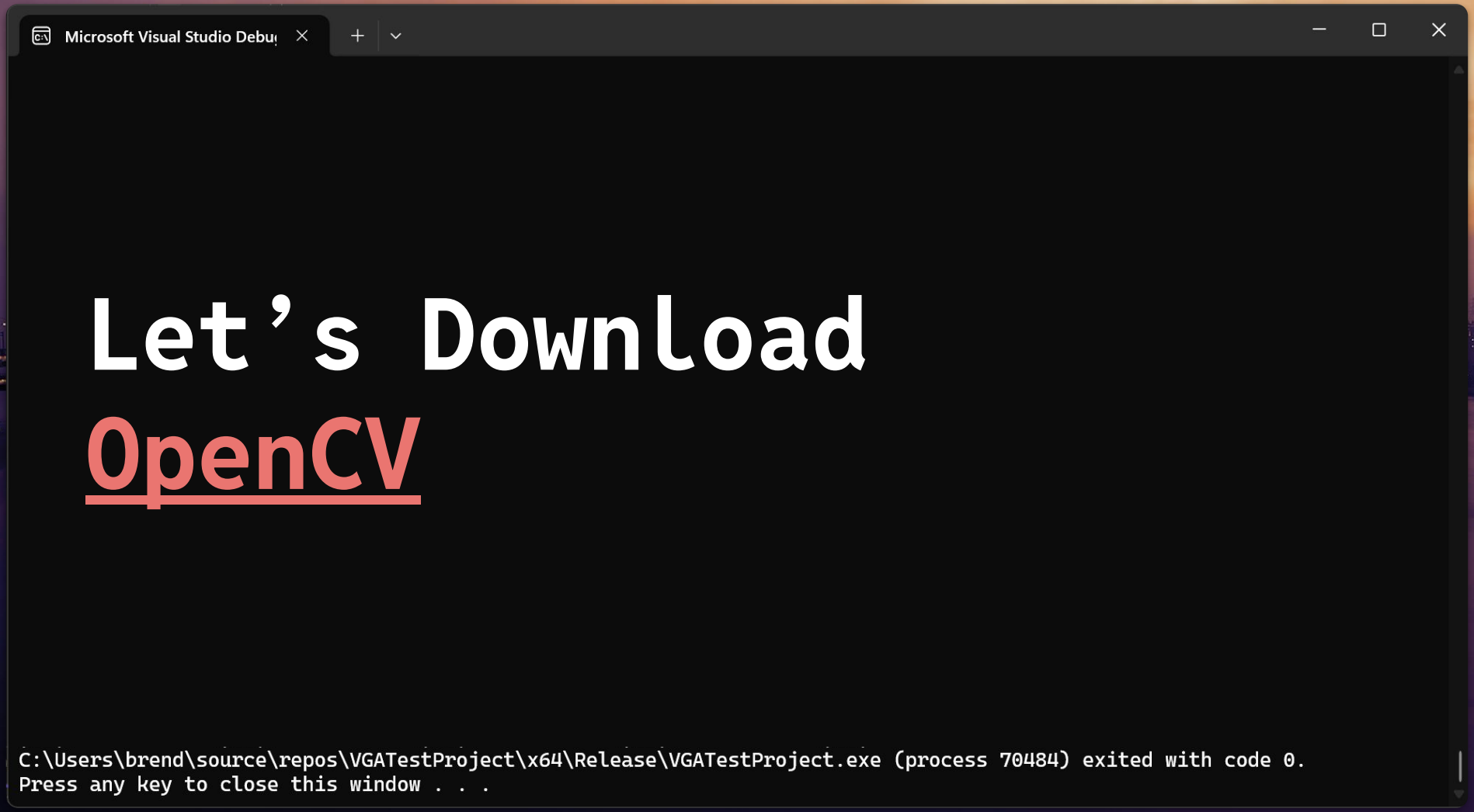
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Let’s Download
OpenCV
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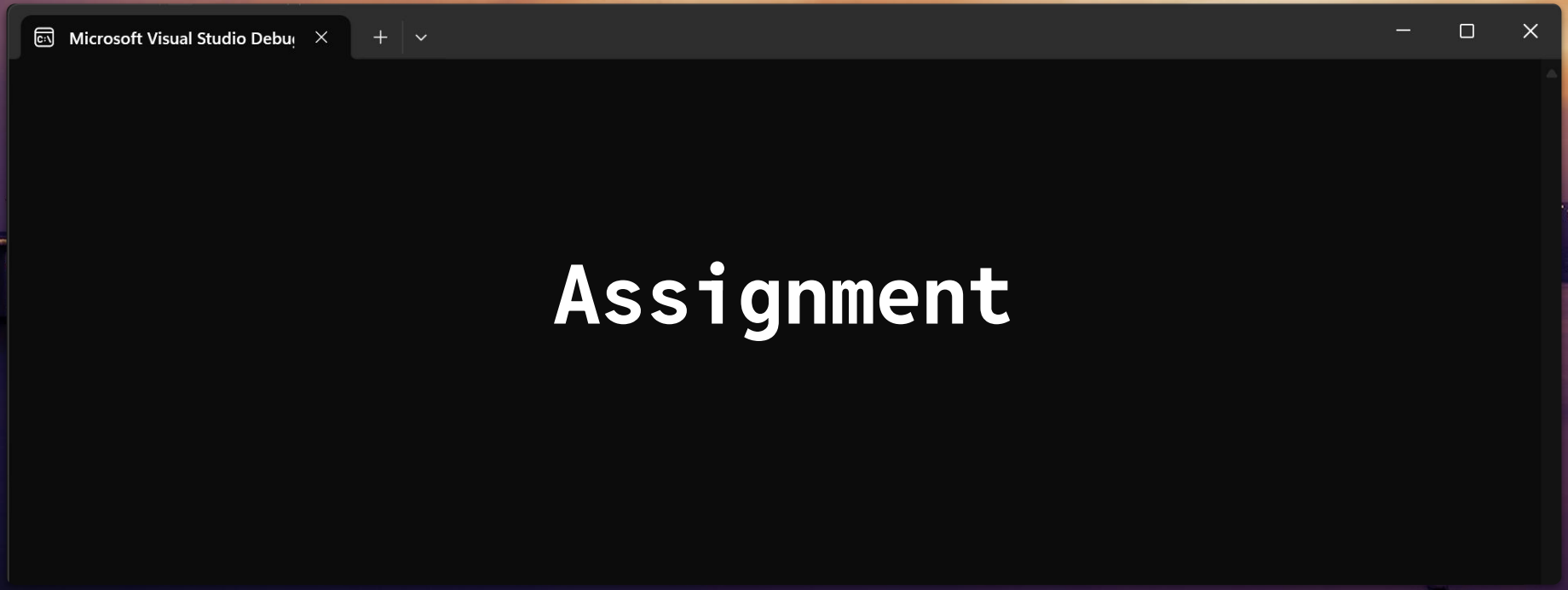
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Assignment

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Convert Images to Animation Frames

Use OpenCV to turn images into frames of animation.

(Optional: Read Video Files as Well)

I will walk you through this process in class!

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