COMSC-110 Chapter 2

Editing and Compiling

Valerie Colber, MBA, PMP, SCPM

What do you need

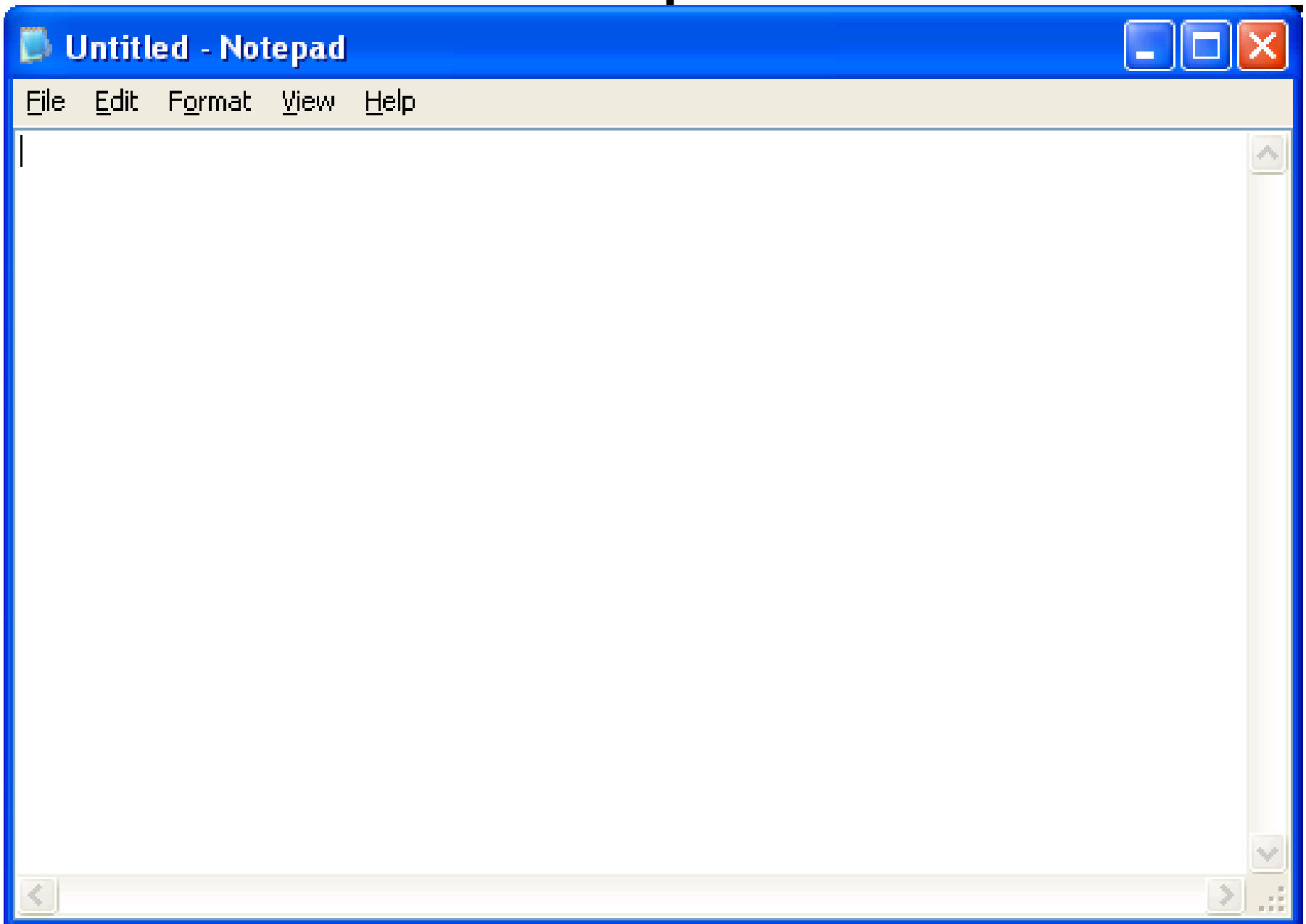
- Choose an editor. Install, if necessary. Configure for your use.
- Choose a compiler. Install, if necessary. Configure for your use.
- Choose a folder on your system for storing your files.
- Configure Windows (if you are using Microsoft)

In class versus outside of class

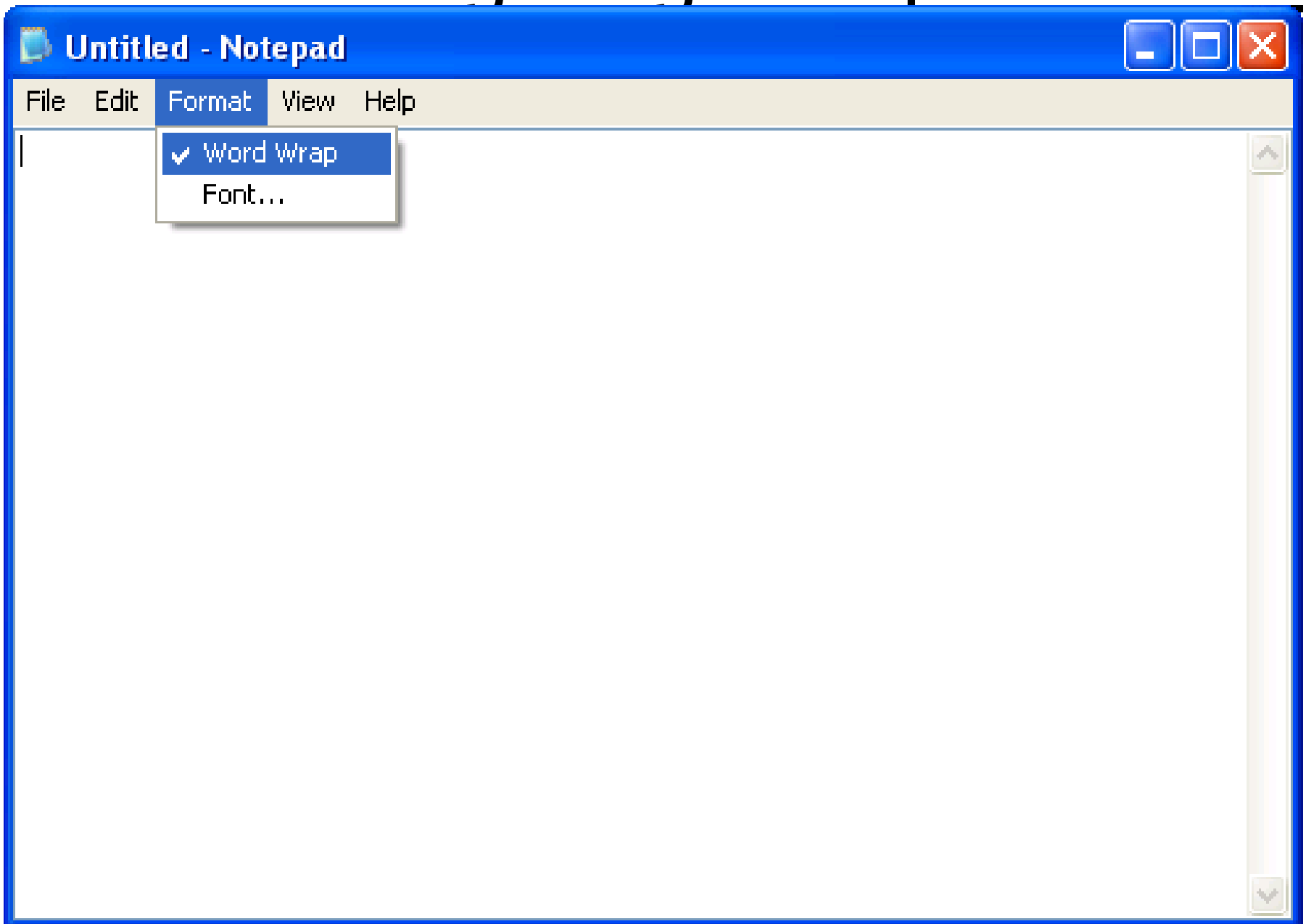
- In class, we will use the classroom computers ONLY!
- Text editor we will use is NotePad.
- Compiler we will use is TDM-MinGW.
- Outside of class, if you have a Microsoft Windows operating system on your computer, then do the same. If you have an Apple operating system, then use TextEdit and XCode. If you have a Linux operating system, GNU compiler.

Choosing a text editor

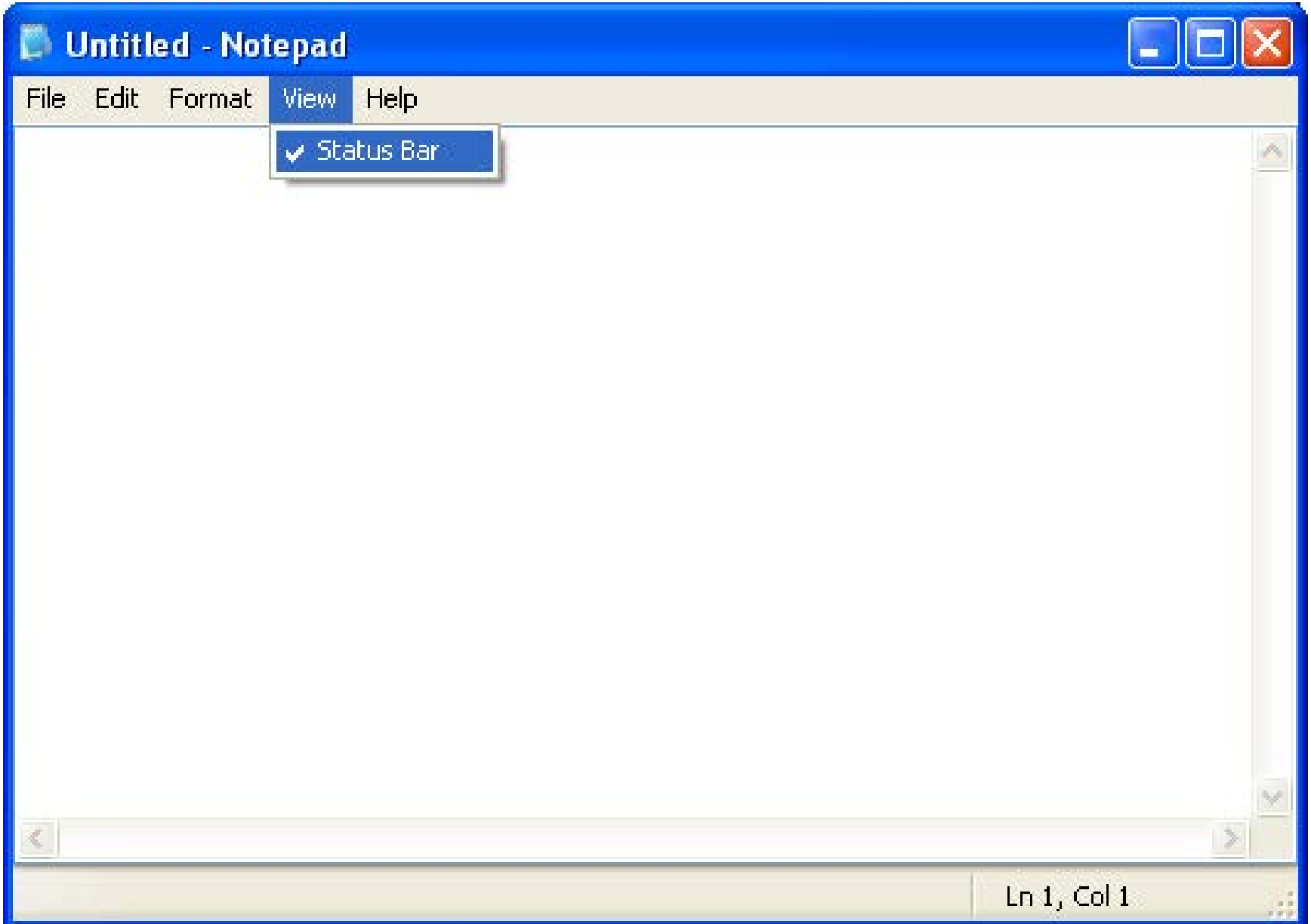
Notepad



Configuring Notepad



Configuring Notepad

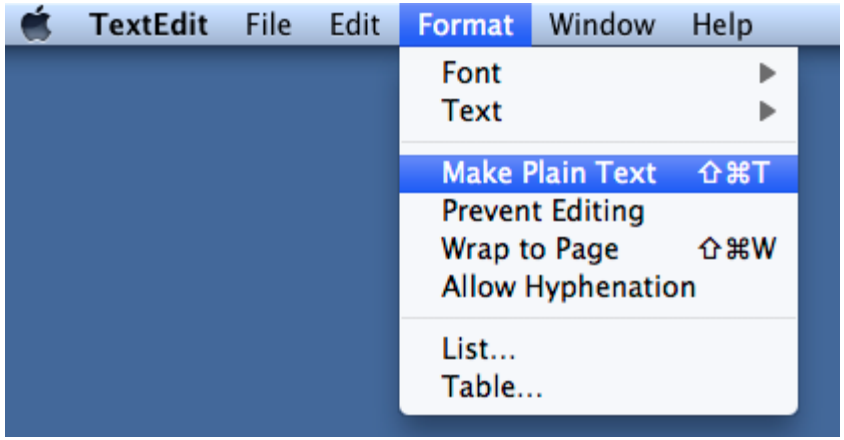


Apple

- TextEdit is a simple, open-source word processor and text editor, first featured in NeXT's NeXTSTEP and OpenStep.
- It is now distributed with macOS since Apple Inc.'s acquisition of NeXT, and available as a GNUstep application for other Unix-like operating systems such as Linux.

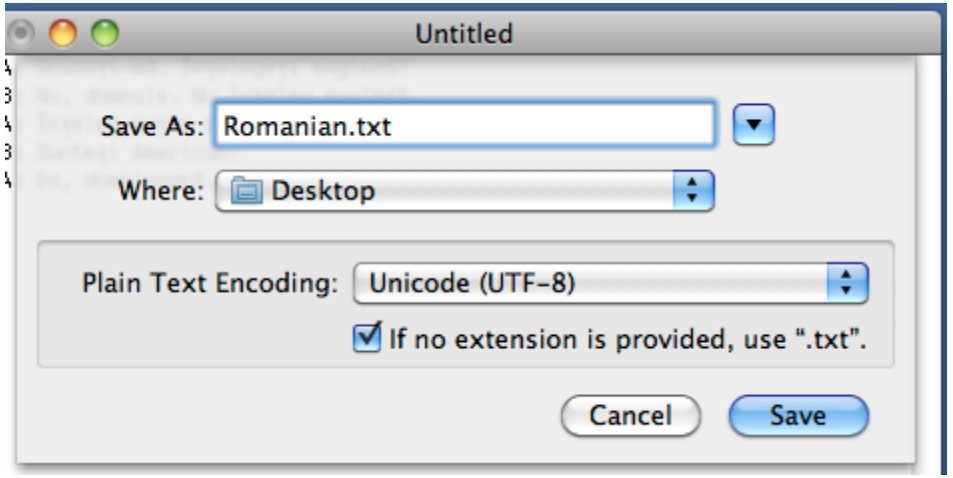
Apple

- Use TextEdit
- You must change the settings to “Plain Text”.
- In the Save As window, you must change Plain Text Coding to “Unicode (UTF-8)”
- Check the box for “if no extension is provided, use .txt”



Apple

- under FORMAT in the MENUBAR choose MAKE PLAIN TEXT
- in the menubar under FILE choose SAVE AS...
- by PLAIN TEXT ENCODING choose UNICODE (UTF-8)



Choosing a compiler

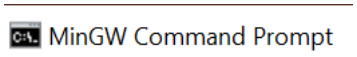
Linux

- There is quite a variety of C++ compilers available.
- Your system may already have a C++ compiler installed on it.
- For example, Linux and UNIX computers often have GNU installed.
- To find out if GNU is installed, go to a "command prompt" and enter the command **g++**.
- If the command is recognized, as indicated by the message "no input files", then you have the GNU C++ compiler.

Microsoft

- But Windows computers usually do not have GNU, and installation of a compiler is required.
- TDM MinGW compiler is free, and requires the least storage and memory.

  http://tdm-gcc.tdragon.net/download
- Warning! Microsoft and TDM-MinGW have the same window icon and look the same! TDM-MinGW window is the compiler, and Microsoft DOS Command is only for executing DOS commands and won't compile your program.



Apple

- First check to see if a compiler is already installed.
- Find the "Terminal" app.
- It's in the Applications folder's Utilities folder.
- Start it up, and in the small, white window with
- the flashing "cursor", enter the command g++.
- If it says "command not found", then it's not installed, and you'll need to read the next paragraph. But it if says "no input files", then it's installed already!
- To install, get XCode for free from the App store.
- To find it easily, go to

  http://developer.apple.com/xcode

  and click the "View in Mac App Store" button.
- Then just download and install XCode as you would do for any other app.
- Once installed, you will never have to run it as you would run a normal app.
- But the first time you try to compile something using the instructions that follow, there should be a popup message guiding you to install "command line tools" and that will complete the installation process.

Anytime anywhere

- You can also write C++ programs using nothing but your Internet browser! Just go to

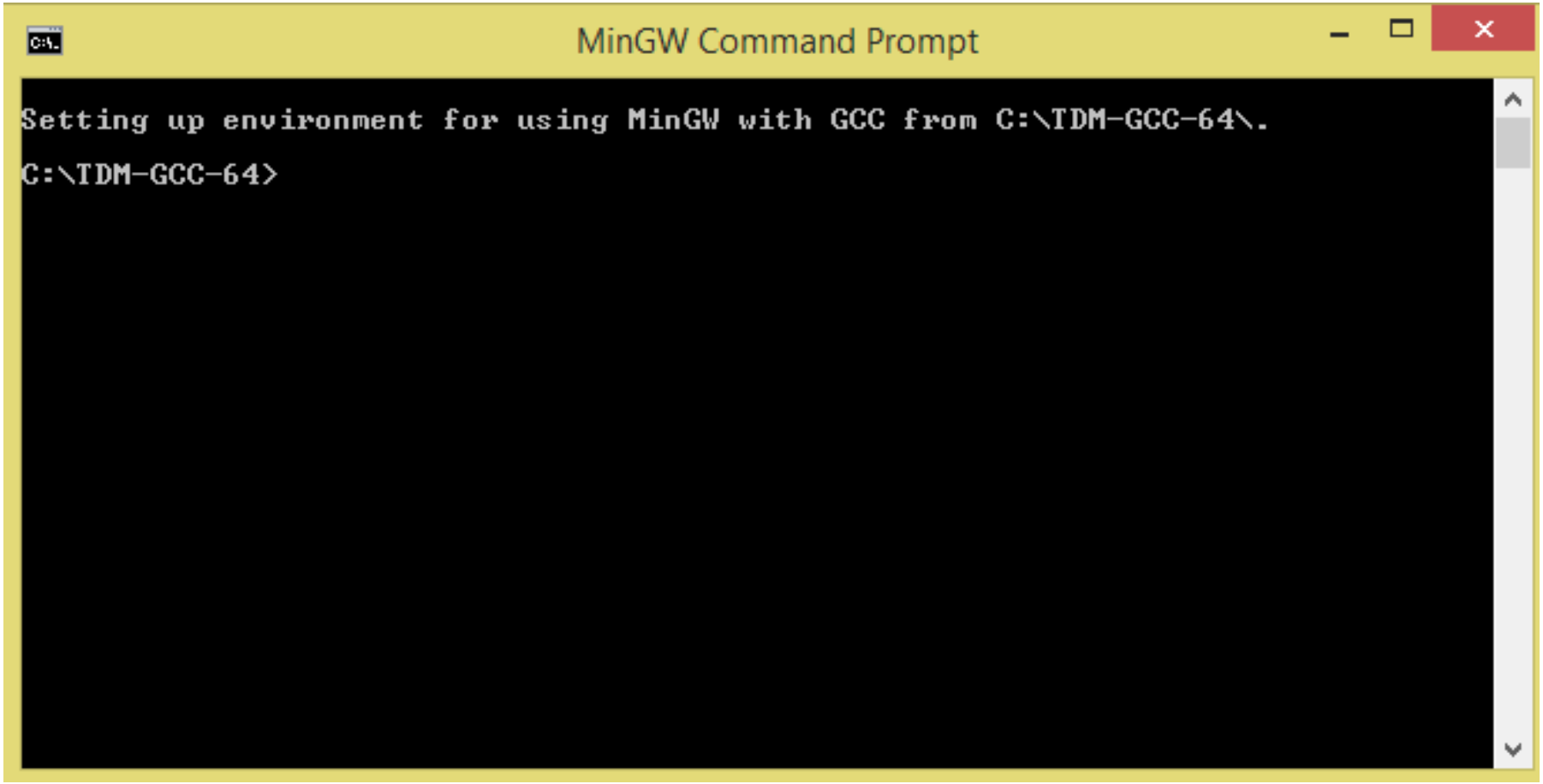
https://www.tutorialspoint.com/compile_cpp11_online.php

- where you'll see a place to write your code, a place to type your main program, and button to run it ("Compile & Execute").
- If you're not quite sure about all this, then the online compiler is the way to go, because there's nothing to install.

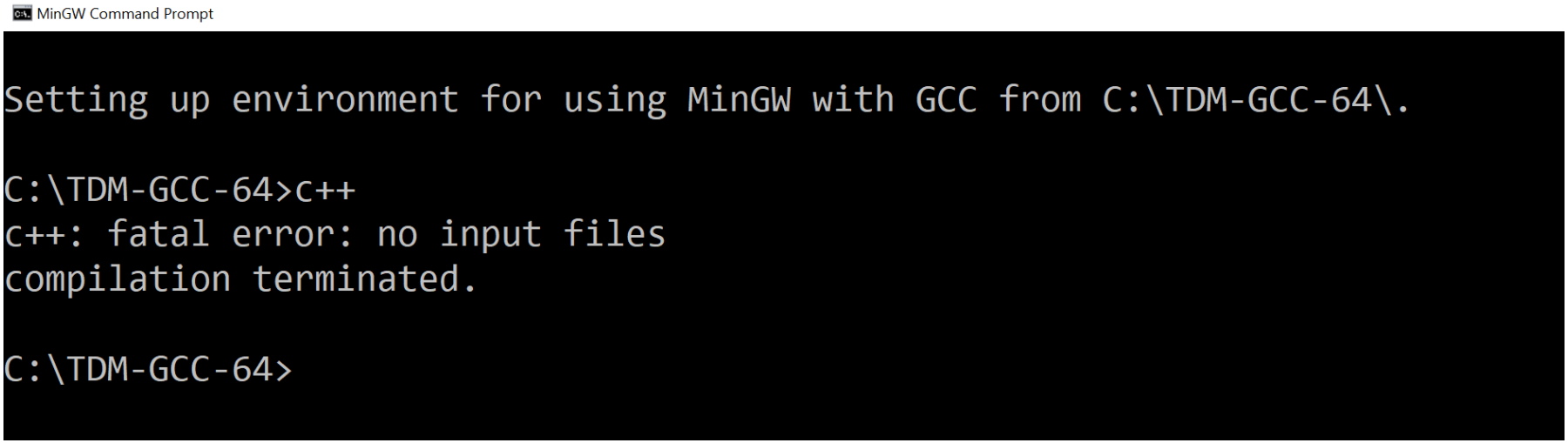
Confirming your C++ installation

- After you have installed a compiler, you should verify that it is properly installed so that you will be able to use it.
- To do so, you need to get a "command prompt" window and enter a compiler command, as explained below.
- Do: Start|All Programs|TDM-GCC-64| MinGW Command Prompt
- This is NOT the same as the DOS command prompt!

TDM MinGW Command Prompt



Type c++ at the prompt



- This will tell you that the compiler is working.

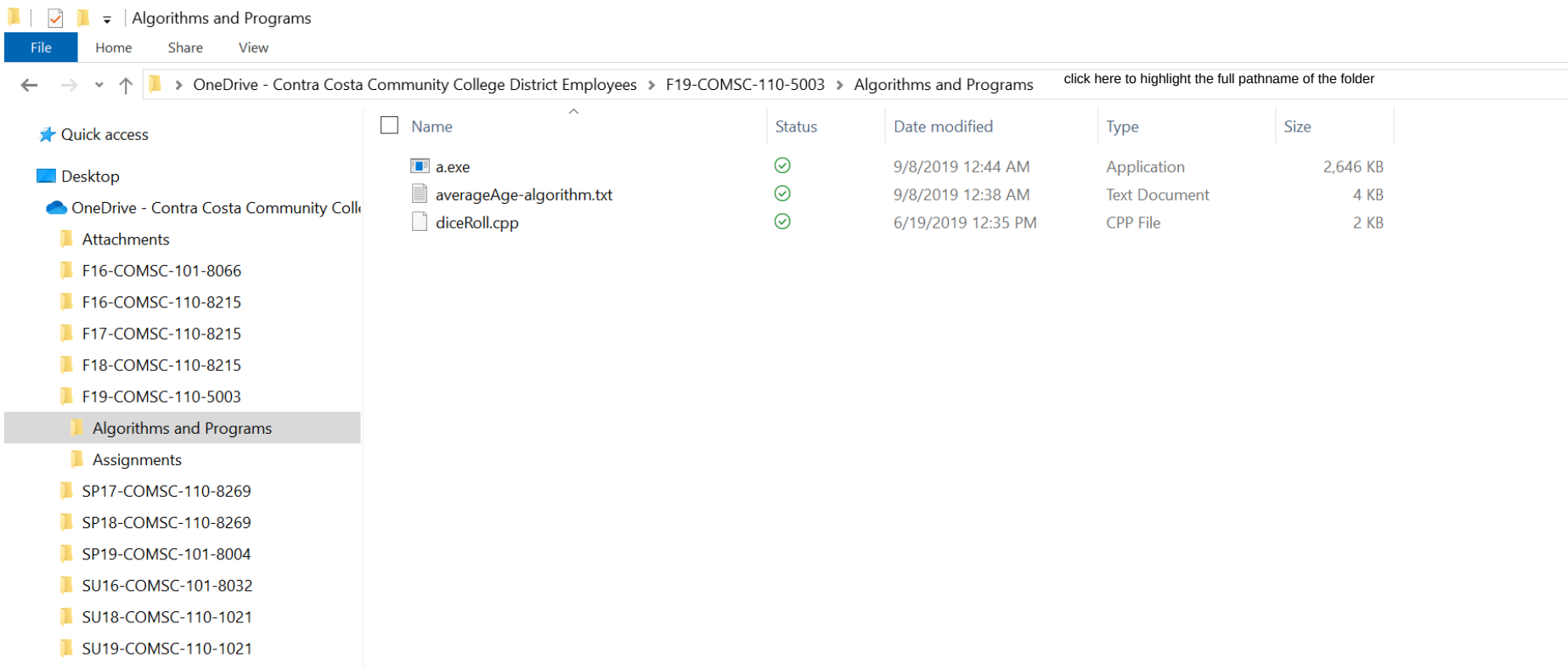
Choose your “working folder”

- Decide where you want to store your files on your computer — either in a folder of you hard drive or on removable media such as a flash drive or SD card.
- This is called the “working folder” — also known as the “working directory”.
- From Windows Explorer, copy the complete pathname of your working folder.
- Make sure you back up your files!

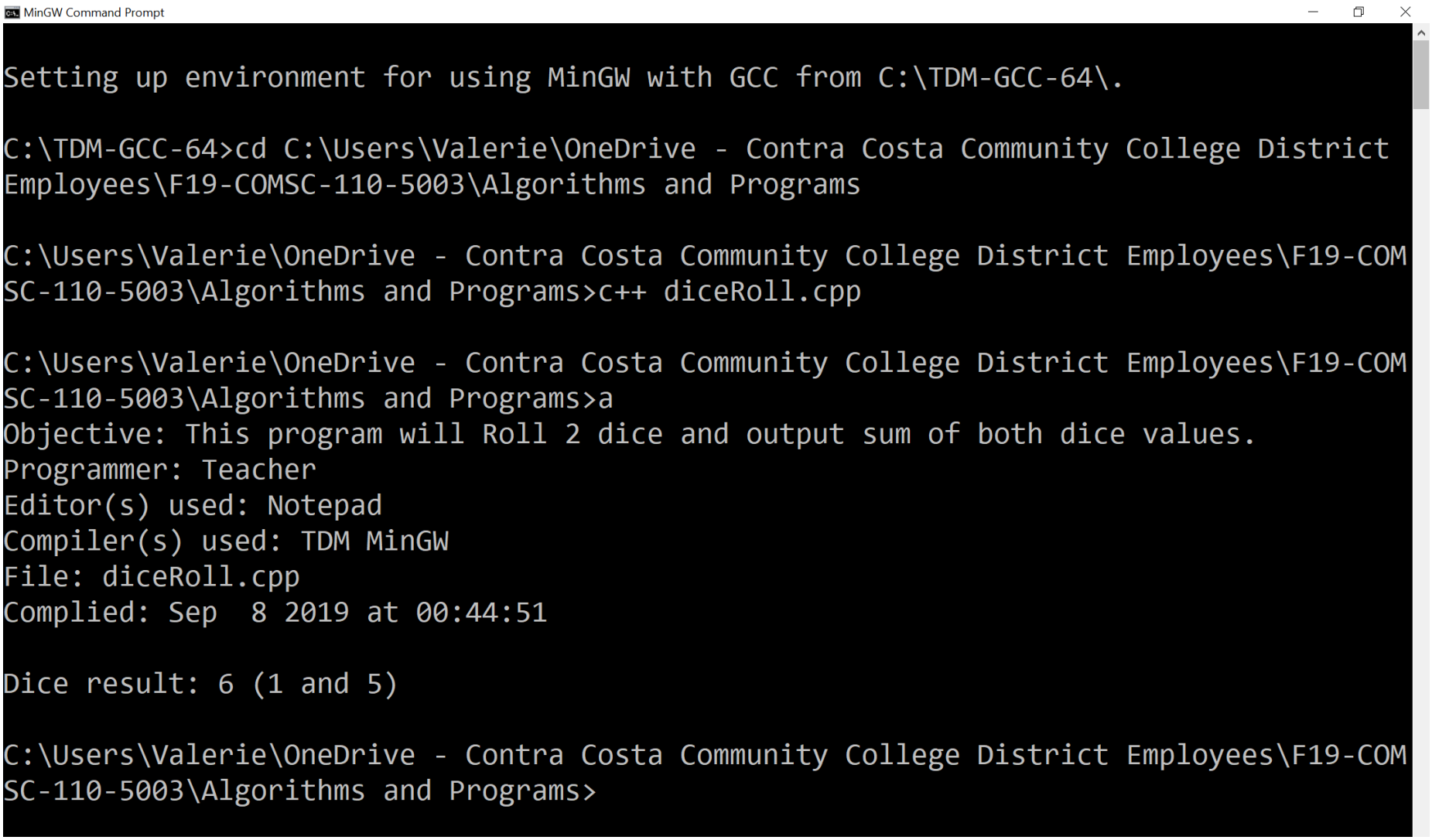
Point TDM-MinGW to your work folder

- Highlight the address of your working folder to copy it (left click just once to the right of the folder address in File Explorer and hold the CTRL key while pressing the C key)
- Change directory to your working folder by using the command cd and 1 space and right click to paste the folder address

Point TDM-MinGW to your work folder



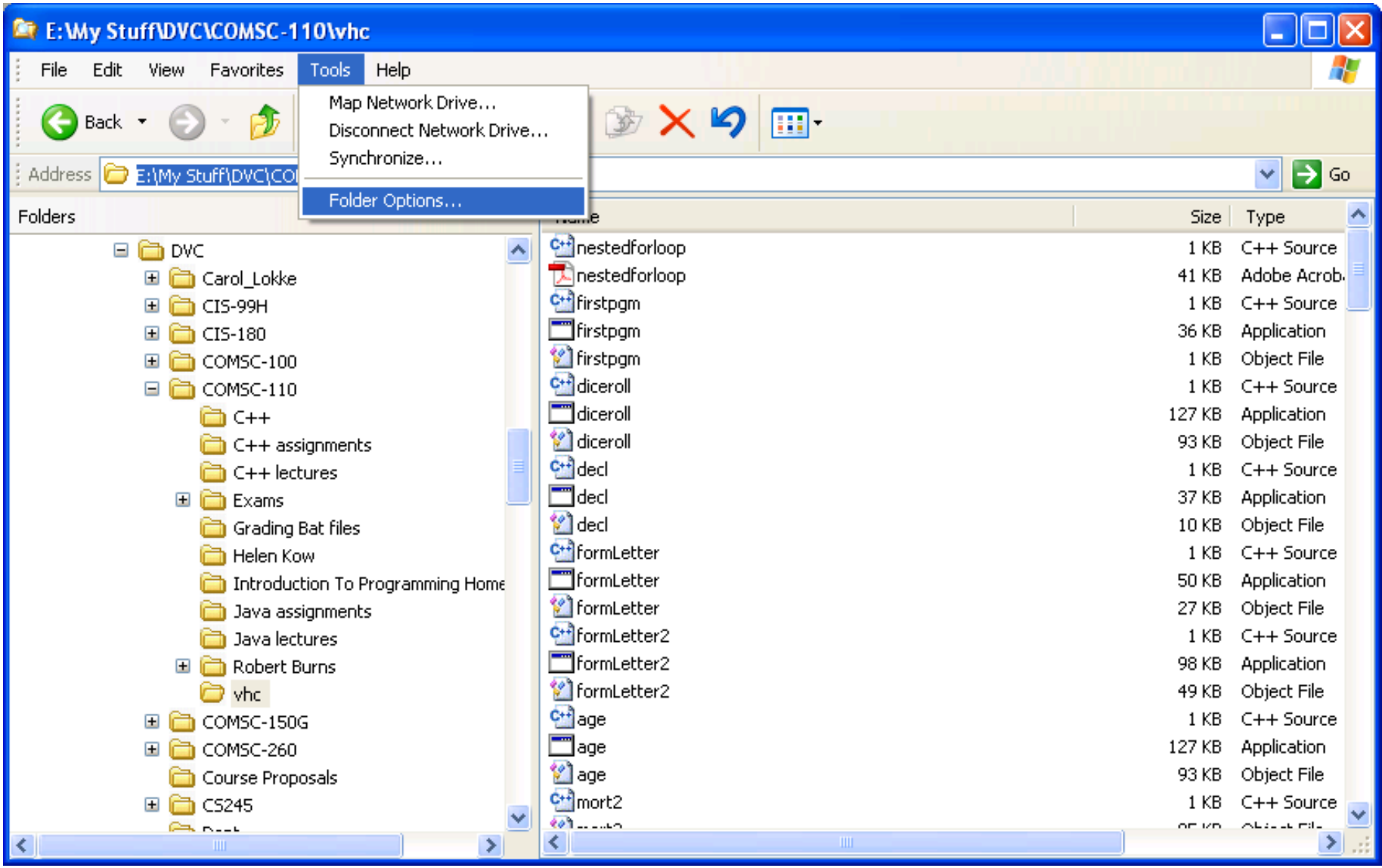
Point TDM-MinGW to your work folder



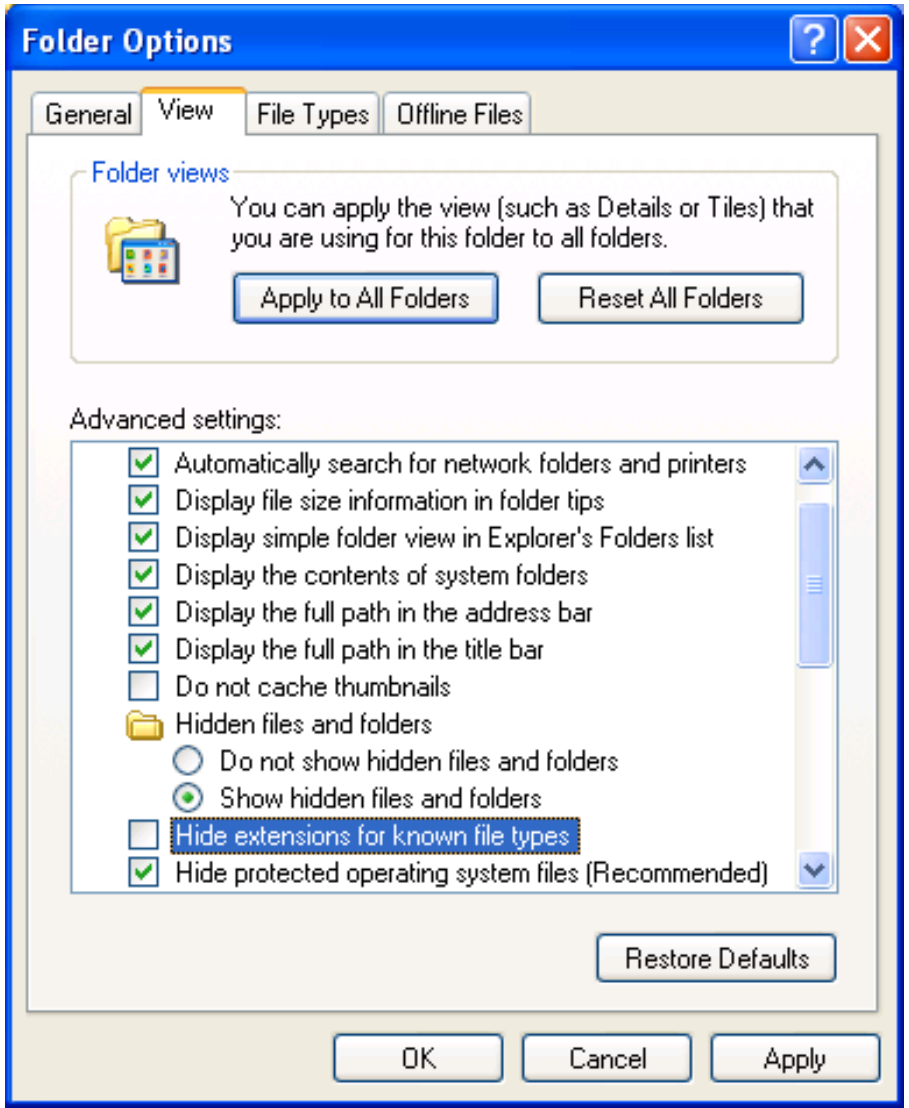
How to back up your files

- Use your free college MS OneDrive
- Copy them from your flash drive to your hard drive of your own computer.
- Email your files to yourself.
- If you have space on your ISP’s server or Google Drive for storing files, you can copy your files there.

Configuring Windows for programming



Configuring Windows for programming



World’s smallest C++ program

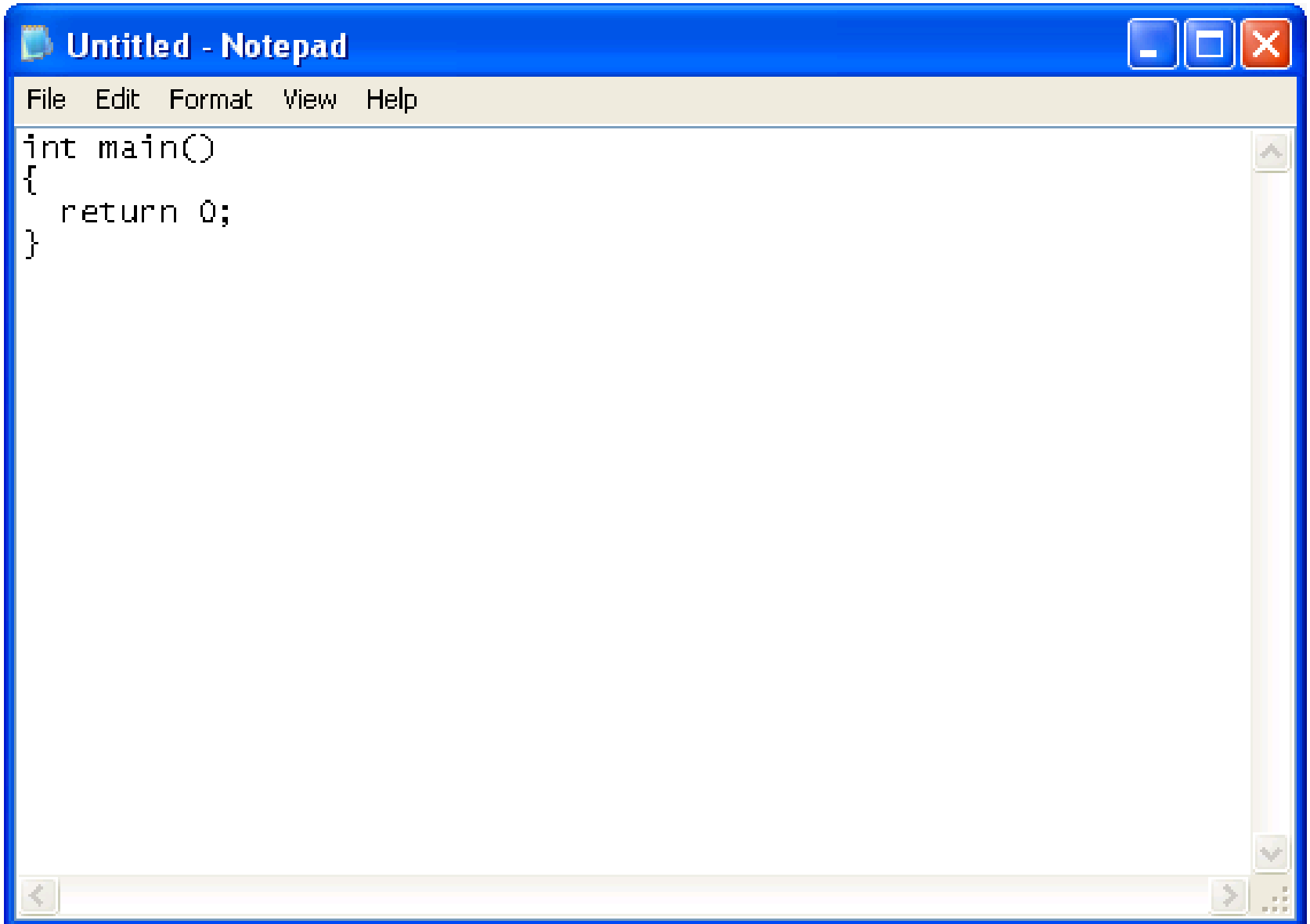
```
//world’s smallest c++ program
int main()
{

} //main program
```

```
//Objective:  template for C++ programs and to test code
//Name: Teacher
//Course: COMSC-110-5003
//Compiler: TDM MinGW
//Editor: MS NotePad

//libraries
#include <iostream>
using namespace std;

//Programmer defined data types
//NONE

//Special compiler dependent definitions
//NONE

//global constants/variables
//NONE

//Programmer defined functions
//NONE

//main program
int main()
{
  //Data
  //NONE

  // output my name and objective and program information
  cout << "Objective: This program will serve as a template for all programs\n written in this course.\n";
  cout << "Programmer: Teacher\n";
  cout << "Editor(s) used: Notepad\n";
  cout << "Compiler(s) used: TDM MinGW\n";
  cout << "File: " << __FILE__ << endl;
  cout << "Complied: " << __DATE__ << " at " << __TIME__ << endl << endl;

}//main
```

How to type code

- The tendency is to type code "linearly" – that is, from the top line to the bottom.
- But that is not the best way to type code.
- Matching parentheses and curly braces appear throughout code, and the toughest part is to keep track of these and make sure that each open parenthesis has a matching closing parenthesis.
- The easiest way to do that is to type opening and closing symbols together, and then separate them.
- You should type the opening curly brace, then on the next line type the closing curly brace.
- Then make a blank line between the two and type "return 0;".
- Use *2 spaces* to indent! DO NOT use tab key!

Typing your program in Notepad



Saving a file

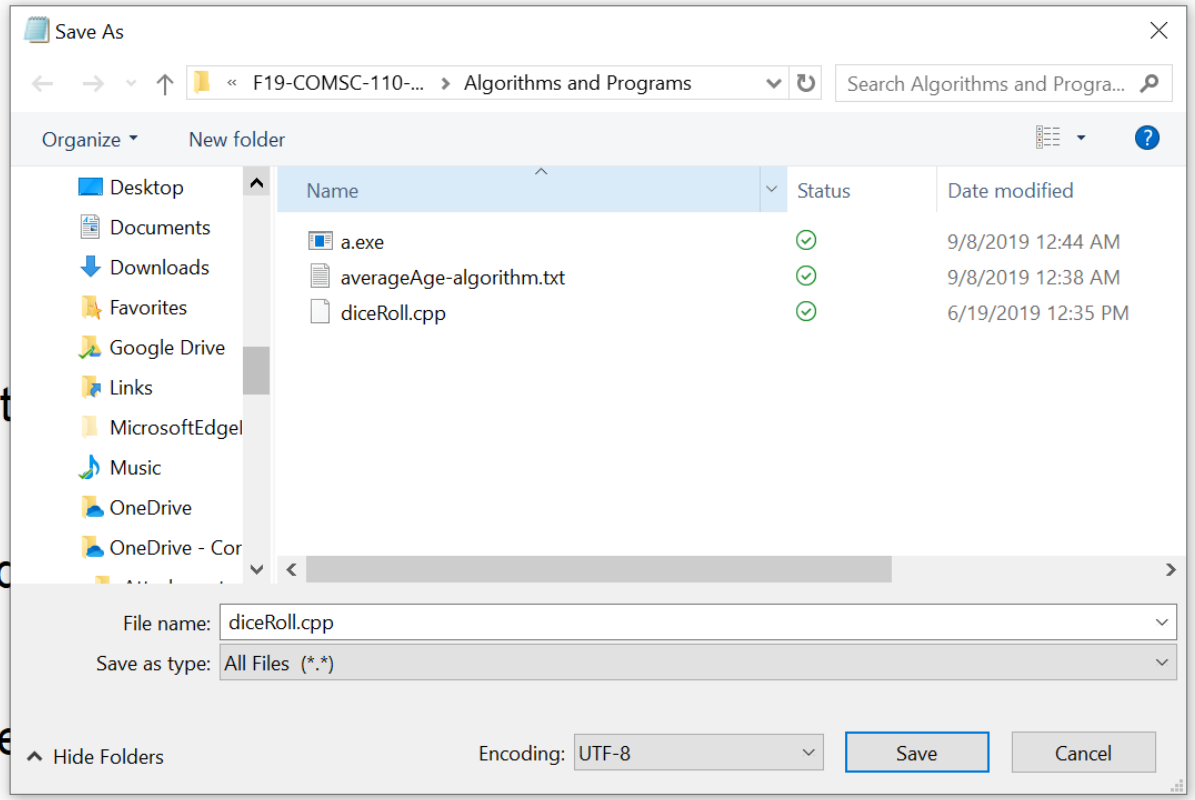
- download the file **programTemplate.cpp** into your work folder Algorithms and Programs for storing your programming files.
- Change the Save as type to “All files” or enclose the filename in quotes, or else **.txt** may be appended to the filename!
- The CPP file is called the "source file", and it contains "source code".

Saving the program in Notepad

*diceRoll.cpp - Notepad

File Edit Format View Help

```
//Objective:  Roll 2 dice and output sum of both dice values
//Name: Teacher 1234567
//Course: COMSC-110-5003
//Compiler: TDM MinGW
//Editor: MS NotePad

//libraries
#include <iostream>
#include <cstdlib>
#include <ctime>
using namespace std;

//Programmer defined dat
//NONE

//Special compiler depenc
//NONE

//global constants/variable
//NONE
```



Ln 1, Col 1 100% Windows (CRLF) UTF-8

Compiling

- go to a command prompt and navigate to the drive and folder containing your edited file.
- Run the compiler by typing this command:
- using TDM-MinGW, **c++ programName.cpp**
- using GNU, **g++ hello.cpp -o programName**

Recompiling

- When you use the command line to compile your programs, it will seem as if there is a lot of typing to do -- repetitive typing.
- But you do not have to retype the compile command over and over again.
- Most systems let you use the UP and DOWN ARROWs of the keyboard to recall a recently-typed command.
- On Windows systems, you can also use the F7 key to get a menu of recently-typed commands, although the UP ARROW is the easiest way to recall the last-typed command.
- We will use TDM MinGW C++ in command line mode.

Programming and programming techniques

1. Problem definition
2. Plan solution
3. Code program
4. Test program
5. Document program

References

- INTRODUCTION TO PROGRAMMING USING C++ by Robert Burns