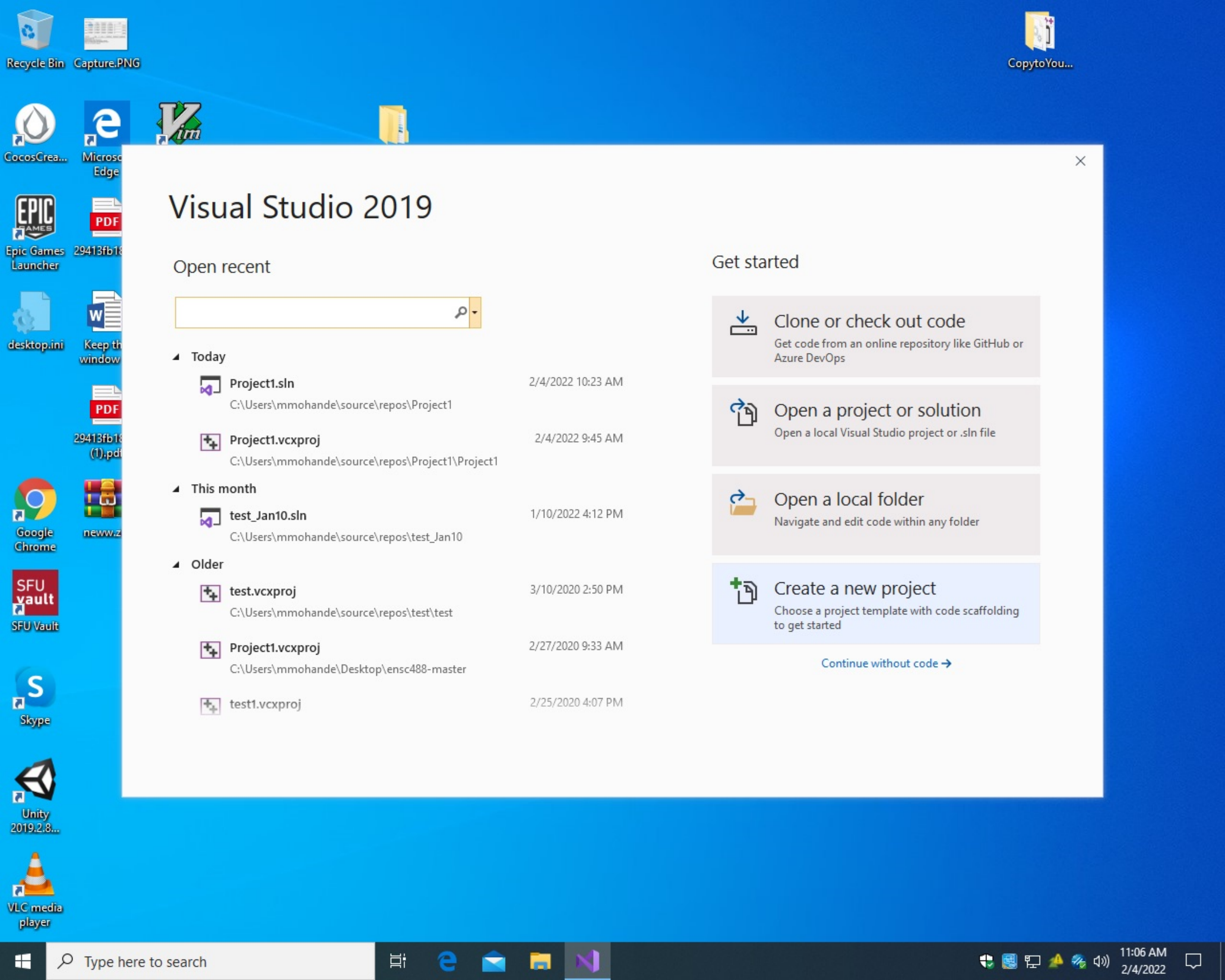
To setup the ENSC-488 emulator please follow the instructions in the following pages.

- The emulator is compatible with Visual Studio 2019 and 2017. (may be compatible with other versions but we have not tested)


Visual Studio 2019
Open recent
Today
Project1.sln
2/4/2022 10:23 AM
C:\Users\mmohande\source\repos\Project1
Project1.vcxproj
2/4/2022 9:45 AM
C:\Users\mmohande\source\repos\Project1\Project1
This month
test_Jan10.sln
1/10/2022 4:12 PM
C:\Users\mmohande\source\repos\test_Jan10
Older
test.vcxproj
3/10/2020 2:50 PM
C:\Users\mmohande\source\repos\test\test
Project1.vcxproj
2/27/2020 9:33 AM
C:\Users\mmohande\Desktop\ensc488-master
test1.vcxproj
2/25/2020 4:07 PM
Get started
Clone or check out code
Get code from an online repository like GitHub or Azure DevOps
Open a project or solution
Open a local Visual Studio project or .sln file
Open a local folder
Navigate and edit code within any folder
Create a new project
Choose a project template with code scaffolding to get started
Continue without code →
Recycle Bin
Capture.PNG
CopytoYou...
CocosCrea...
Microsc Edge
Epic Games Launcher
29413fb18
desktop.ini
Keep th window
29413fb18 (1).pdf
Google Chrome
neww.z
SFU Vault
Skype
Unity 2019.2.8...
VLC media player
Type here to search
11:06 AM
2/4/2022

Create a new project

Search for templates (Alt+S)

Clear all

Recent project templates

Empty Project C++

C++ | All platforms | All project types

Empty Project
Start from scratch with C++ for Windows. Provides no starting files.
C++ Windows Console

Console App
Run code in a Windows terminal. Prints "Hello World" by default.
C++ Windows Console

Windows Desktop Wizard
Create your own Windows app using a wizard.
C++ Windows Desktop Console Library

Windows Desktop Application
A project for an application with a graphical user interface that runs on Windows.
C++ Windows Desktop

Shared Items Project
A Shared Items project is used for sharing files between multiple projects.
C++ Windows Android iOS Linux Desktop Console Library UWP Games Mobile

Back Next

Recycle Bin Capture.PNG CopytoYou... CocosCrea... Microsc Edge Epic Games Launcher 29413fb18 desktop.ini Keep th window 29413fb18 (1).pdf Google Chrome neww.z SFU Vault Skype Unity 2019.2.8... VLC media player

Type here to search 11:06 AM 2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ensc-488-demo-1' (1 of 1 project)
ensc-488-demo-1
References
External Dependencies
Header Files

Add
Class Wizard... Ctrl+Shift+X
Scope to This
New Solution Explorer View
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename
Properties Alt+Enter

New Item... Ctrl+Shift+A
Existing Item... Shift+Alt+A
New Filter
From Cookiecutter...
Class...
Resource...

Solution Explorer Team Explorer

Properties

Header Files Filter Properties

Advanced	
SCC Files	True
General	
(Name)	Header Files
Filter	h;hh;hpp;hxx;hm;inl;inc;ipp;xsd
Unique Identifier	{93995380-89BD-4b04-88EB-625F

(Name)
Specifies the name of the filter.

Output

Show output from:

Error List Output

This item does not support previewing

Add to Source Control

Type here to search

11:07 AM
2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Add Existing Item - ensc-488-demo-1

« Desk... › CopytoYourDir2022 › Search CopytoYourDir2022

Organize New folder

Desktop
Downloads
Documents
Pictures
CopytoYourDir2(
CopytoYourDir2(
Screenshots
test
Microsoft Visual S
repos
This PC
3D Objects
Desktop

Name	Date modified	Type
instructions	1/28/2020 6:29 PM	File fold
lib	1/10/2022 4:39 PM	File fold
ensc-488.h	11/26/2007 11:16 AM	C/C++
glut32.dll	3/26/2007 1:52 PM	Applicat
m5apiw32.dll	3/14/2003 12:21 PM	Applicat
PowerCubeSim.dll	12/19/2019 10:41 AM	Applicat
PowerCubeSim.lib	11/27/2007 6:32 PM	Object F
ProgrammingDemo.cpp	1/28/2020 5:23 PM	C++ So
Scara.ini	11/26/2007 11:17 AM	Configu
stateid.h	10/5/2007 10:30 PM	C/C++
StdAfx.h	10/10/2007 8:34 PM	C/C++

File name: "stateid.h" "StdAfx.h" "ensc-488.h" All Files (*.*)

Add Cancel

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ensc-488-demo-1' (1 of 1 project)
ensc-488-demo-1
References
External Dependencies
Header Files
Resource Files
Source Files

Solution Explorer Team Explorer

Properties

Header Files Filter Properties

Advanced	
SCC Files	True
General	
(Name)	Header Files
Filter	h;hh;hpp;hxx;hm;inl;inc;ipp;xsd
Unique Identifier	{93995380-89BD-4b04-88EB-625F

(Name)
Specifies the name of the filter.

Output

Show output from:

Error List Output

Add to Source Control

Type here to search 11:07 AM 2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ensc-488-demo-1' (1 of 1 project)
ensc-488-demo-1
References
External Dependencies
Header Files
ensc-488.h
stateid.h
StdAfx.h
Resource Files

New Item... Ctrl+Shift+A
Existing Item... Shift+Alt+A
New Filter
From Cookiecutter...
Class...
Resource...

Add
Class Wizard... Ctrl+Shift+X
Scope to This
New Solution Explorer View
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename
Properties Alt+Enter

Solutio

Propert

Resou

Advanced
SCC Files True
General
(Name) Resource Files
Filter rc;ico;cur;bmp;dlg;rc2;rct;bin;rgs;
Unique Identifier {67DA6AB6-F800-4c08-8B7A-83B

(Name)
Specifies the name of the filter.

Output
Show output from:

Error List Output

This item does not support previewing

Add to Source Control

Type here to search

11:08 AM
2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Add Existing Item - ensc-488-demo-1

« Desk... › CopytoYourDir2022 › Search CopytoYourDir2022

Organize New folder

Desktop
Downloads
Documents
Pictures
CopytoYourDir2(
CopytoYourDir2(
Screenshots
test
Microsoft Visual S
repos
This PC
3D Objects
Desktop

Name	Date modified	Type
instructions	1/28/2020 6:29 PM	File fold
lib	1/10/2022 4:39 PM	File fold
ensc-488.h	11/26/2007 11:16 AM	C/C++
glut32.dll	3/26/2007 1:52 PM	Applicat
m5apiw32.dll	3/14/2003 12:21 PM	Applicat
PowerCubeSim.dll	12/19/2019 10:41 AM	Applicat
PowerCubeSim.lib	11/27/2007 6:32 PM	Object F
ProgrammingDemo.cpp	1/28/2020 5:23 PM	C++ So
Scara.ini	11/26/2007 11:17 AM	Configu
stateid.h	10/5/2007 10:30 PM	C/C++
StdAfx.h	10/10/2007 8:34 PM	C/C++

File name: PowerCubeSim.lib All Files (*.*)

Add Cancel

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ensc-488-demo-1' (1 of 1 project)
ensc-488-demo-1
References
External Dependencies
Header Files
ensc-488.h
stateid.h
StdAfx.h
Resource Files
Source Files

Solution Explorer Team Explorer

Properties

Resource Files Filter Properties

Advanced	
SCC Files	True
General	
(Name)	Resource Files
Filter	rc;ico;cur;bmp;dlg;rc2;rct;bin;rgs;
Unique Identifier	{67DA6AB6-F800-4c08-8B7A-83B

(Name)
Specifies the name of the filter.

Output

Show output from:

Error List Output

Add to Source Control

Type here to search 11:08 AM 2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Solution Explorer

Search Solution Explorer (Ctrl+;)

- Solution 'ensc-488-demo-1' (1 of 1 project)
  - ensc-488-demo-1
    - References
    - External Dependencies
    - Header Files
      - ensc-488.h
      - stateid.h
      - StdAfx.h
    - Resource Files
      - PowerCubeSim.lib
    - Source Files

Add
- New Item... Ctrl+Shift+A
- Existing Item... Shift+Alt+A
- New Filter
- From Cookiecutter...
- Class...
- Resource...

Class Wizard... Ctrl+Shift+X
Scope to This
New Solution Explorer View
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename
Properties Alt+Enter

Propert

Source

Adva	
SCC Files	True
General	
(Name)	Source Files
Filter	cpp;c;cc;cxx;def;odl;idl;hpj;bat;as
Unique Identifier	{4FC737F1-C7A5-4376-A066-2A3

(Name)
Specifies the name of the filter.

Output

Show output from:

Error List Output

This item does not support previewing

Add to Source Control

Type here to search

11:09 AM
2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Server Explorer Toolbox

Add Existing Item - ensc-488-demo-1

« Desk... › CopytoYourDir2022 › Search CopytoYourDir2022

Organize New folder

Microsoft Visual S
repos
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
SFU Home (U:)
Network

Name	Date modified	Type
instructions	1/28/2020 6:29 PM	File fold
lib	1/10/2022 4:39 PM	File fold
ensc-488.h	11/26/2007 11:16 AM	C/C++
glut32.dll	3/26/2007 1:52 PM	Applicat
m5apiw32.dll	3/14/2003 12:21 PM	Applicat
PowerCubeSim.dll	12/19/2019 10:41 AM	Applicat
PowerCubeSim.lib	11/27/2007 6:32 PM	Object F
ProgrammingDemo.cpp	1/28/2020 5:23 PM	C++ So
Scara.ini	11/26/2007 11:17 AM	Configu
stateid.h	10/5/2007 10:30 PM	C/C++
StdAfx.h	10/10/2007 8:34 PM	C/C++

File name: ProgrammingDemo.cpp All Files (*.*)

Add Cancel

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ensc-488-demo-1' (1 of 1 project)
ensc-488-demo-1
References
External Dependencies
Header Files
ensc-488.h
stateid.h
StdAfx.h
Resource Files
PowerCubeSim.lib
Source Files

Solution Explorer Team Explorer

Properties

Source Files Filter Properties

Advanced	
SCC Files	True
General	
(Name)	Source Files
Filter	cpp;c;cc;cxx;def;odl;idl;hpj;bat;as
Unique Identifier	{4FC737F1-C7A5-4376-A066-2A3

(Name)
Specifies the name of the filter.

Output

Show output from:

Error List Output

Add to Source Control

Type here to search 11:09 AM 2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Live Share

Server Explorer Toolbox

Build Solution Ctrl+Shift+B
Rebuild Solution
Clean Solution
Build full program database file for solution
Run Code Analysis on Solution Alt+F11
Build ensc-488-demo-1 Ctrl+B
Rebuild ensc-488-demo-1
Clean ensc-488-demo-1
Run Code Analysis on ensc-488-demo-1
Project Only
Profile Guided Optimization
Batch Build...
Configuration Manager...
Compile Ctrl+F7
Run Code Analysis on File Ctrl+Shift+Alt+F7

ProgrammingDemo.cpp

ensc-488-demo-1

```
1   // Programmin                                    tion.
2   //
3
4   #include "std
5   #include <std
6   #include <con
7   #include "ens
8   #include <ios
9   #include <str
10  using namespa
11
12  int main(int
13  {
14      JOINT q1
15      JOINT q2
16      printf("K
17
18
19      char ch;
20      int c;
21
22      const int ESC = 27;
23
24      printf("1Press any key to continue \n");
25      printf("2Press ESC to exit \n");
26
27      c = _getch() ;
28
29      while (1)
30      {
31
32          if (c != ESC)
33          {
34              printf("Press '1' or '2' \n");
35              ch = _getch();
36
37              if (ch == '1')
38              {
39                  MoveToConfiguration(q1);
40                  //DisplayConfiguration(q1);
41              }
```

100 % No issues found Ln: 1 Ch: 1 TABS CRLF

Solution Explorer

Search Solution Explorer (Ctrl+;)

- Solution 'ensc-488-demo-1' (1 of 1 project)
  - ensc-488-demo-1
    - References
    - External Dependencies
    - Header Files
      - ensc-488.h
      - stateid.h
      - StdAfx.h
    - Resource Files
      - PowerCubeSim.lib
    - Source Files
      - ProgrammingDemo.cpp

Solution Explorer Team Explorer

Properties

ProgrammingDemo.cpp File Properties

Misc	
(Name)	ProgrammingDemo.cpp
Content	False
File Type	C/C++ Code
Full Path	C:\Users\mmohande\Desktop\C
Included In Project	True
Relative Path	..\..\..\..\Desktop\CopytoYourDir2

(Name)
Names the file object.

Output

Show output from:

Error List Output

Ready Add to Source Control

Type here to search 11:11 AM 2/4/2022

CopytoYourDir2022

File | Home | Share | View

Pin to Quick access | Copy | Paste | Cut | Copy path | Paste shortcut — Clipboard

Move to | Copy to | Delete | Rename — Organize

New folder | New item | Easy access — New

Properties | Open | Edit | History — Open

Select all | Select none | Invert selection — Select

CopytoYourDir2022 ›

Search CopytoYourDir2022

Quick access
- Desktop
- Downloads
- Documents
- Pictures
- CopytoYourDir2020
- CopytoYourDir2022
- Screenshots
- test

This PC
- 3D Objects
- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- Local Disk (C:)
- SFU Home (U:)

Network

Name	Date modified	Type	Size
instructions	1/28/2020 6:29 PM	File folder	
lib	1/10/2022 4:39 PM	File folder	
ensc-488.h	11/26/2007 11:16 AM	C/C++ Header	8 KB
glut32.dll	3/26/2007 1:52 PM	Application exten...	232 KB
m5apiw32.dll	3/14/2003 12:21 PM	Application exten...	272 KB
PowerCubeSim.dll	1		
PowerCubeSim.lib	1		
ProgrammingDemo.cpp	1		
Scara.ini	1		
stateid.h	1		
StdAfx.h	1		

Share with Skype
7-Zip
CRC SHA
Share
Scan with OfficeScan
Give access to
Add to archive...
Add to "CopytoYourDir2022.rar"
Compress and email...
Compress to "CopytoYourDir2022.rar" and email
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties

11 items | 3 items selected 1.85 MB

Type here to search

11:10 AM
2/4/2022

Debug

File | Home | Share | View

Pin to Quick access | Copy | Paste | Cut | Copy path | Paste shortcut — Clipboard

Move to | Copy to | Delete | Rename — Organize

New folder | New item | Easy access — New

Properties | Open | Edit | History — Open

Select all | Select none | Invert selection — Select

This PC › Local Disk (C:) › Users › mmohande › source › repos › ensc-488-demo-1 › Debug

Search Debug

- Quick access
  - Desktop
  - Downloads
  - Documents
  - Pictures
  - CopytoYourDir2020
  - CopytoYourDir2022
  - Screenshots
  - test
- This PC
  - 3D Objects
  - Desktop
  - Documents
  - Downloads
  - Music
  - Pictures
  - Videos
  - Local Disk (C:)
  - SFU Home (U:)
- Network

Name	Date modified	Type	Size
ensc-488-demo-1.exe	2/4/2022 11:12 AM	Application	39 KB
ensc-488-demo-1.ilk	2/4/2022 11:12 AM	Incremental Linke...	341 KB
ensc-488-demo-1.pdb	2/4/2022 11:12 AM	Program Debug D...	452 KB
glut32.dll	3/26/2007 1:52 PM	Application exten...	232 KB
m5apiw32.dll	3/14/2003 12:21 PM	Application exten...	272 KB
PowerCubeSim.dll	11/27/2007 6:29 PM	Application exten...	1,393 KB

6 items | 3 items selected 1.85 MB

Type here to search

11:12 AM
2/4/2022

For Visual Studio 2022 (or above)

The Visual Studio Project must be setup to compile in **Win32 mode**.

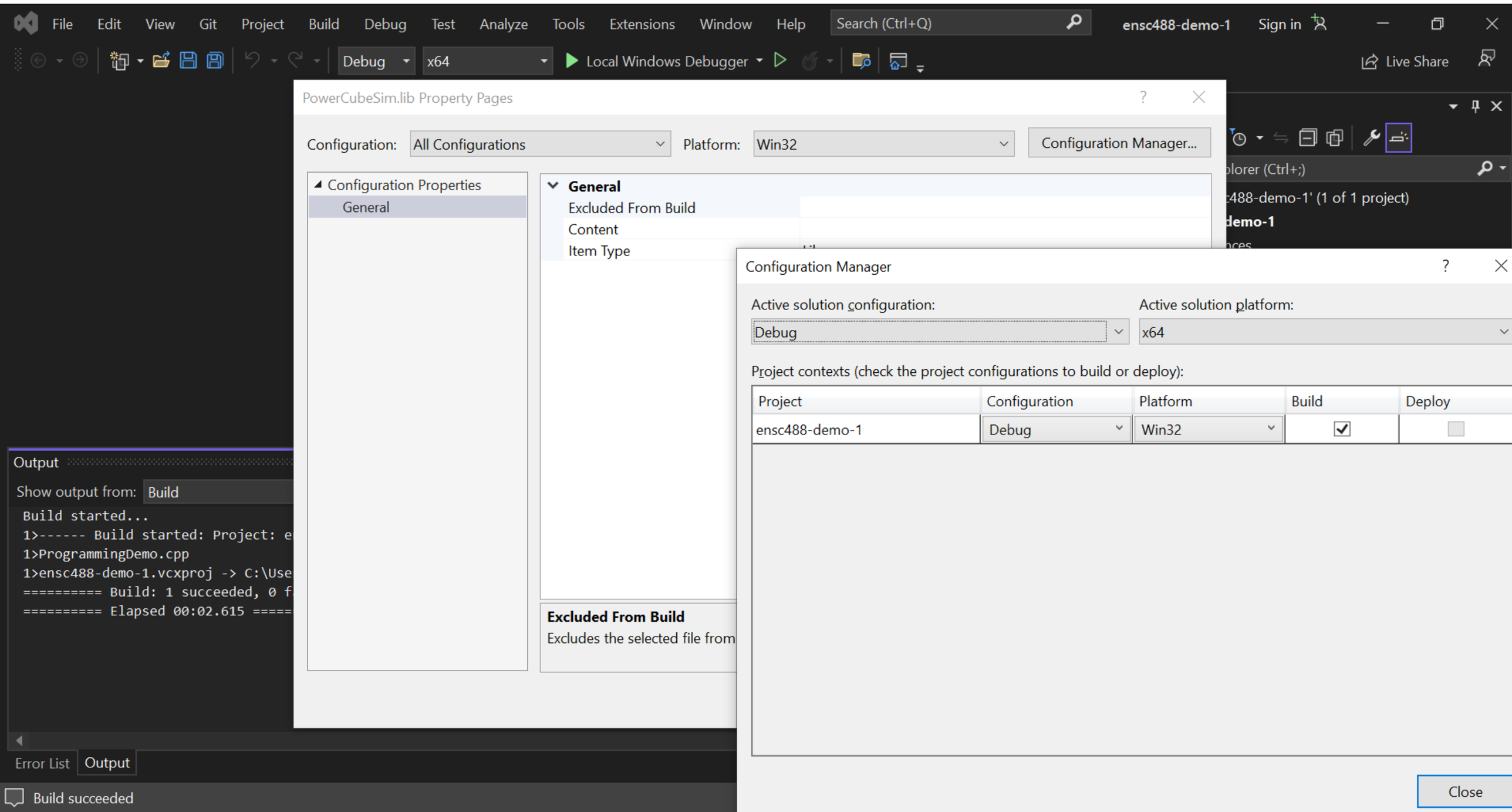
By default, VS2022 selects x64 as the target platform, and this will cause the compiler to complain.

If you receive the following error in Visual Studio 2022 (or above):

⊗	LNK2019	unresolved external symbol "__declspec(dllimport) bool __cdecl MoveToConfiguration(double (&)[4],bool)" (__imp_?MoveToConfiguration@@YA_NAEAY03N_N@Z) referenced in function main	Project1	ProgrammingDemo.obj	1
⚠	LNK4272	library machine type 'x86' conflicts with target machine type 'x64'	Project1	PowerCubeSim.lib	1
⊗	LNK1120	1 unresolved externals	Project1	Project1.exe	1

Configure the project's target to compile using Win32 as the platform (for VS2022+ versions only):

1) Go To: Project->properties->configuration manager.
2) Change the project target to Win32



File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help Search (Ctrl+Q) ensc-488-demo-1

Debug x86 Local Windows Debugger Live Share

Local Windows Debugger

Server Explorer Toolbox

ProgrammingDemo.cpp

ensc-488-demo-1 (Global Scope)

```
1   // ProgrammingDemo.cpp : Defines the entry point for the console application.
2   //
3
4   #include "stdafx.h"
5   #include <stdio.h>
6   #include <conio.h>
7   #include "ensc-488.h"
8   #include <iostream>
9   #include <string>
10  using namespace std;
11
12  int main(int argc, char* argv[])
13  {
14      JOINT q1 = {0, 0, -100, 0};
15      JOINT q2 = {90, 90, -200, 45};
16      printf("Keep this window in focus, and...\n");
17
18
19      char ch;
20      int c;
21
22      const int ESC = 27;
23
24      printf("1Press any key to continue \n");
25      printf("2Press ESC to exit \n");
26
27      c = _getch() ;
28
29      while (1)
30      {
31
32          if (c != ESC)
33          {
34              printf("Press '1' or '2' \n");
35              ch = _getch();
36
37              if (ch == '1')
38              {
39                  MoveToConfiguration(q1);
40                  //DisplayConfiguration(q1);
41              }
```

100 % No issues found Ln: 1 Ch: 1 TABS CRLF

Solution Explorer

Search Solution Explorer (Ctrl+;)

- Solution 'ensc-488-demo-1' (1 of 1 project)
  - ensc-488-demo-1
    - References
    - External Dependencies
    - Header Files
      - ensc-488.h
      - stateid.h
      - StdAfx.h
    - Resource Files
      - PowerCubeSim.lib
    - Source Files
      - ProgrammingDemo.cpp

Solution Explorer Team Explorer

Properties

ProgrammingDemo.cpp File Properties

Misc	
(Name)	ProgrammingDemo.cpp
Content	False
File Type	C/C++ Code
Full Path	C:\Users\mmohande\Desktop\C
Included In Project	True
Relative Path	..\..\..\..\Desktop\CopytoYourDir2

(Name)
Names the file object.

Output

Show output from: Build

```
1>------ Build started: Project: ensc-488-demo-1, Configuration: Debug Win32 ------
1>ProgrammingDemo.cpp
1>ensc-488-demo-1.vcxproj -> C:\Users\mmohande\source\repos\ensc-488-demo-1\Debug\ensc-488-demo-1.exe
========== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped ==========
```

Error List Output

Build succeeded Add to Source Control

Type here to search 11:13 AM 2/4/2022

File Edit View Project Build Debug Architecture Test Analyze Tools Extensions Window Help

Debug x86 Continue

Process: [13244] ensc-488-demo-1.exe Lifecycle Events Thread: Stack Frame:

ensc-488-demo-1 (Global Scope)

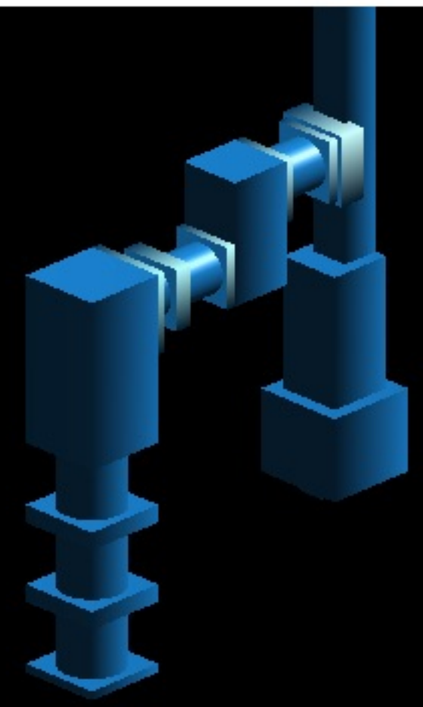
```
1   // ProgrammingDemo.cpp : Defines the entry point for the console application.
2   //
3
4   #include "stdafx.h"
5   #include <stdio.h
6   #include <conio.h
7   #include "ensc-48
8   #include <iostrea
9   #include <string>
10  using namespace s
11
12  int main(int argc
13  {
14      JOINT q1 = {0
15      JOINT q2 = {9
16      printf("Keep
17
18
19      char ch;
20      int c;
21
22      const int ESC
23
24      printf("1Pres
25      printf("2Pres
26
27      c = _getch()
28
29      while (1)
30      {
31
32          if (c !=
33          {
34              print
35              ch =
36
37              if (ch == '1')
```

100 % No issues found Ln:

C:\Users\mmohande\source\repos\ensc-488-demo-1\Debug\ensc-488-demo-1.exe

```
Keep this window in focus, and...
1Press any key to continue
2Press ESC to exit
```

ENSC-488: Simulated Scara Robot



Scara-SIM: by Z.Y. 2007

Robot Status Monitor

Robot Status

	Value	Velocity	Acceleration	Current	State	
Joint 1	90	0	0	-1	33280	Means
Joint 2	0	0	0	-1	33280	Means
Joint 3	-175	0	0	-1	33280	Means
Joint 4	0	0	0	-1	33280	Means

Messages: Clear Limits StopRobot ResetRobot HomeRobot

Initializing, please wait...
The emulator has been initialized.

Autos

Search (Ctrl+E) Search Depth:

Name Value Type

Autos Locals Watch 1

Call Stack

Name

Call Stack Breakpoints

Ready

Type here to search

11:13 AM
2/4/2022