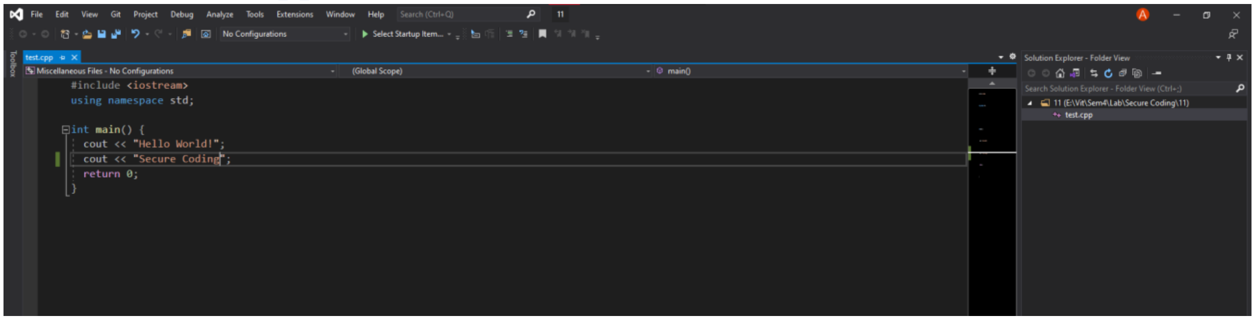
Lab experiment – Creating secure and safe executable

Download and install visual studio (recent edition)
Write a C++ code of your own to build an executable and run the same.
Download process explorer and verify the DEP & ASLR status
Enable software DEP, ASLR and SEH in the visual studio and rebuild the same executable
Again, verify the DEP & ASLR status in the process explorer
Report the same with separate screenshot - before and after enabling DEP & ASLR.

Install Visual Studio.

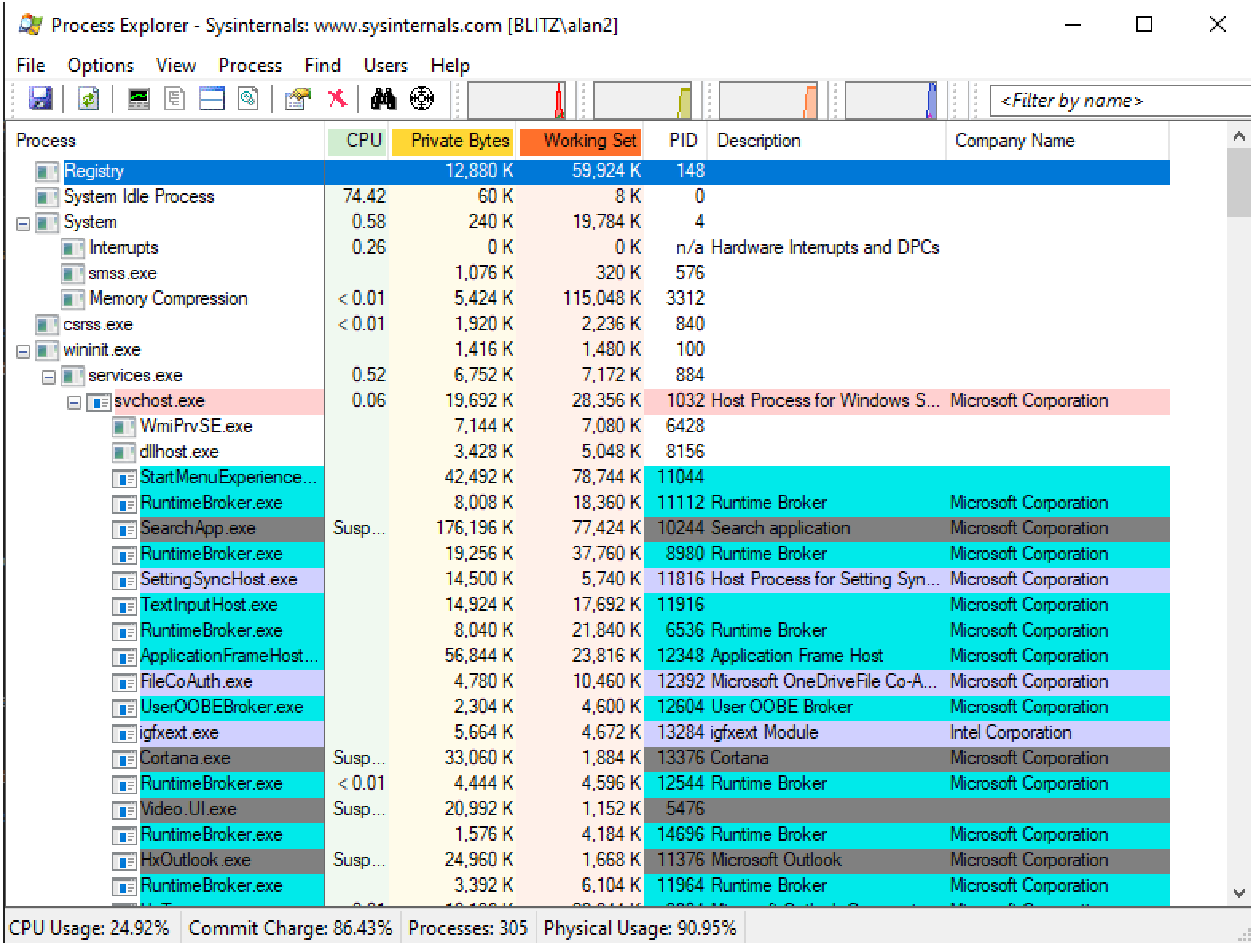
Write a C++ snippet



```
#include <iostream>
using namespace std;

int main() {
    cout << "Hello World!";
    cout << "Secure Coding";
    return 0;
}
```

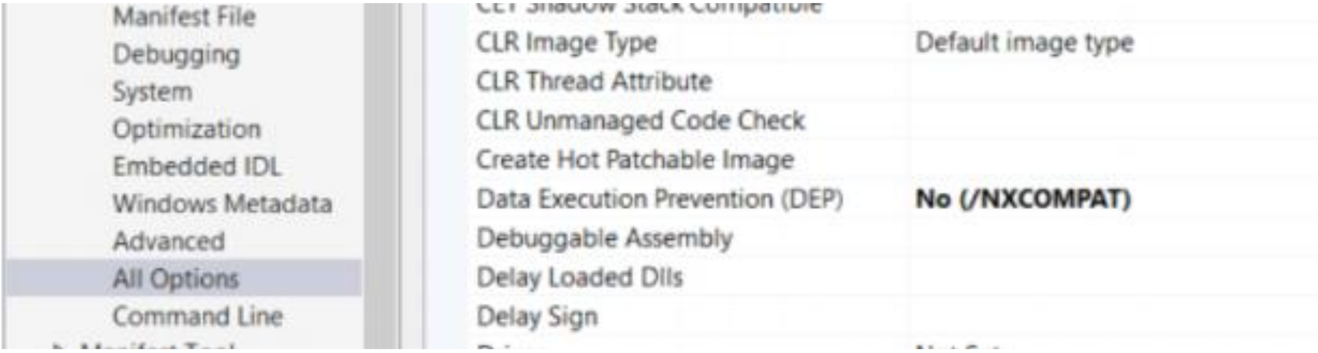
Execute Works perfectly, as shown on the process explorer.


Process Explorer - Sysinternals: www.sysinternals.com [BLITZ\alan2]
File
Options
View
Process
Find
Users
Help
<Filter by name>

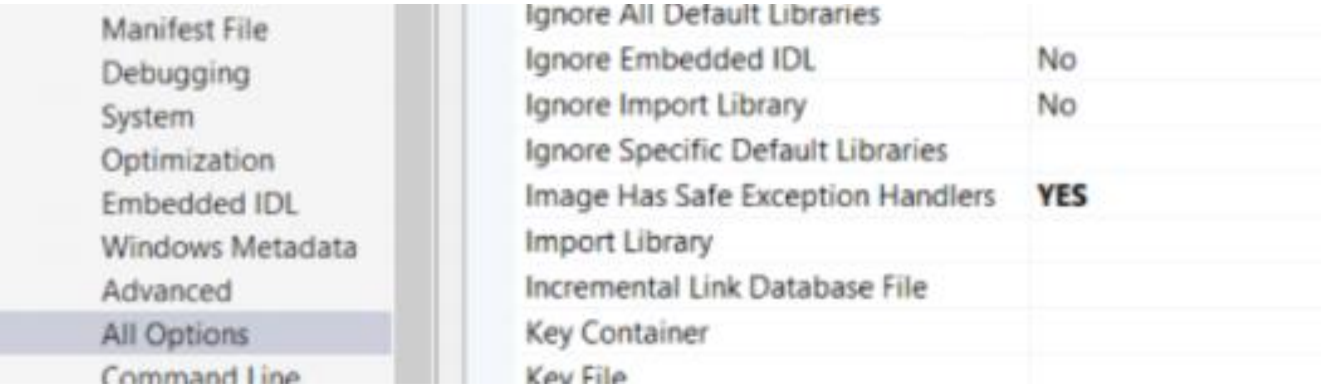
Process	CPU	Private Bytes	Working Set	PID	Description	Company Name
Registry		12,880 K	59,924 K	148		
System Idle Process	74.42	60 K	8 K	0		
System	0.58	240 K	19,784 K	4		
Interrupts	0.26	0 K	0 K	n/a	Hardware Interrupts and DPCs	
smss.exe		1,076 K	320 K	576		
Memory Compression	< 0.01	5,424 K	115,048 K	3312		
csrss.exe	< 0.01	1,920 K	2,236 K	840		
wininit.exe		1,416 K	1,480 K	100		
services.exe	0.52	6,752 K	7,172 K	884		
svchost.exe	0.06	19,692 K	28,356 K	1032	Host Process for Windows S...	Microsoft Corporation
WmiPrvSE.exe		7,144 K	7,080 K	6428		
dllhost.exe		3,428 K	5,048 K	8156		
StartMenuExperience...		42,492 K	78,744 K	11044		
RuntimeBroker.exe		8,008 K	18,360 K	11112	Runtime Broker	Microsoft Corporation
SearchApp.exe	Susp...	176,196 K	77,424 K	10244	Search application	Microsoft Corporation
RuntimeBroker.exe		19,256 K	37,760 K	8980	Runtime Broker	Microsoft Corporation
SettingSyncHost.exe		14,500 K	5,740 K	11816	Host Process for Setting Syn...	Microsoft Corporation
TextInputHost.exe		14,924 K	17,692 K	11916		Microsoft Corporation
RuntimeBroker.exe		8,040 K	21,840 K	6536	Runtime Broker	Microsoft Corporation
ApplicationFrameHost...		56,844 K	23,816 K	12348	Application Frame Host	Microsoft Corporation
FileCoAuth.exe		4,780 K	10,460 K	12392	Microsoft OneDriveFile Co-A...	Microsoft Corporation
UserOOBEBroker.exe		2,304 K	4,600 K	12604	User OOBE Broker	Microsoft Corporation
igfxext.exe		5,664 K	4,672 K	13284	igfxext Module	Intel Corporation
Cortana.exe	Susp...	33,060 K	1,884 K	13376	Cortana	Microsoft Corporation
RuntimeBroker.exe	< 0.01	4,444 K	4,596 K	12544	Runtime Broker	Microsoft Corporation
Video.UI.exe	Susp...	20,992 K	1,152 K	5476		
RuntimeBroker.exe		1,576 K	4,184 K	14696	Runtime Broker	Microsoft Corporation
HxOutlook.exe	Susp...	24,960 K	1,668 K	11376	Microsoft Outlook	Microsoft Corporation
RuntimeBroker.exe		3,392 K	6,104 K	11964	Runtime Broker	Microsoft Corporation

CPU Usage: 24.92% | Commit Charge: 86.43% | Processes: 305 | Physical Usage: 90.95%

After disabling DEP, ASLR, SHE



CET Shadow Stack Compatible	
CLR Image Type	Default image type
CLR Thread Attribute	
CLR Unmanaged Code Check	
Create Hot Patchable Image	
Data Execution Prevention (DEP)	**No (/NXCOMPAT)**
Debuggable Assembly	
Delay Loaded Dlls	
Delay Sign	



Ignore All Default Libraries
Ignore Embedded IDL No
Ignore Import Library No
Ignore Specific Default Libraries
Image Has Safe Exception Handlers **YES**
Import Library
Incremental Link Database File
Key Container
Key File

On re-building the application and re-running, the build fails.

After re-enabling DEP, ALSR, the application builds successfully.