# CSC1028 Testing Template

This template should allow you to ensure that the project is in working order as it proceeds. First in this document is a blank template that you can use to carry out tests, and after that is a filled out version that shows the tests that I have run on the project. The tests in both sections are split up into sections corresponding to the different sections of the project, which should allow you to test each system individually, as well as as a complete system, to ensure that the program is fully functional. As is mentioned at the end of the tests, this project is not guaranteed to be able to restore a program, as some programs edit environment variables that the project does not currently track.

## File System Scanner Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | Ensure File Scanner detects a file being created | Type echo “test data” > testFile.txt  Into the command line | Template file contains the path for the created file under files\_created |  |  |
| 2 | Ensure that file scanner detects a file being modified | Open a text file and change the contents | Template file contains the path for the modified file under files\_modified |  |  |
| 3 | Ensure that file scanner detects a file being deleted | Delete a file | Template file contains the path for the deleted file under files\_deleted |  |  |
| 4 | Ensure file scanner ignores file creation in a directory that is part of the file filter | Create a file in C://Users\\Ben\\\\AppData\\Local\\Temp | Template file does not contain the file creation |  |  |
| 5 | Ensure file scanner ignores file modification in a directory that is part of the file filter | Modify a file in C://Users\\Ben\\\\AppData\\Local\\Temp | Template file does not contain the file modification |  |  |
| 6 | Ensure file scanner ignores file deleted in a directory that is part of the file filter | Delete a file in C://Users\\Ben\\\\AppData\\Local\\Temp | Template file does not contain the file deletion |  |  |

## Registry Scanner Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | Ensure scanner detects key creation in HKCU | Use regedit to create a key directly under HKCU\Printers  KeyName: KeyToTest | Key listed in template file under HKCU\_created |  |  |
| 2 | Ensure scanner detects key creation in HKLM/Software | Use regedit to create a key directly under HKLM/Software/Google  Key Name:TestKey | Key listed in template file under Software\_created |  |  |
| 3 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers\KeyToTest  Type: REG\_SZ  Name:Test3  Value:ThirdTest | Value listed in template file under HKCU\_created |  |  |
| 4 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google/TestKey  Type: REG\_SZ  Name:Test4  Value:FourthTest | Value listed in template file under Software\_created |  |  |
| 5 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_MULTI\_SZ  Name:Test5  Value:FifthTest | Value listed in template file under HKCU\_created |  |  |
| 6 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/CVSM  Type: REG\_MULTI\_SZ  Name:Test6  Value:SixthTest | Value listed in template file under Software\_created |  |  |
| 7 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_EXPAND\_SZ  Name:Test7  Value:SeventhTest | Value listed in template file under HKCU\_created |  |  |
| 8 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google/TestKey  Type: REG\_EXPAND\_SZ  Name:Test8  Value:EightTest | Value listed in template file under Software\_created |  |  |
| 9 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_DWORD  Name:Test9  Value:NinthTest | Value listed in template file under HKCU\_created |  |  |
| 10 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google  Type: REG\_DWORD  Name:Test10  Value:TenthTest | Value listed in template file under Software\_created |  |  |
| 11 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_BINARY  Name:Test11  Value:EleventhTest | Value listed in template file under HKCU\_created |  |  |
| 12 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google  Type: REG\_BINARY  Name:Test12  Value:Twelfth Test | Value listed in template file under Software\_created |  |  |
| 13 | Ensure scanner ignores filter values | Add a value to a key that exists in the filter file | No value listed in template file |  |  |
| 14 | Ensure scanner detects value modification in HKCU | Use regedit to modify a value directly under HKCU\Printers\KeyToTest  Type: REG\_SZ  Name:Test3  Value:ThirdTest to Edit14 | Value listed in template file under HKCU\_modified |  |  |
| 15 | Ensure scanner detects value deleted in HKLM/Software | Use regedit to delete a value directly under HKLM/Software/Google/TestKey  Type: REG\_SZ  Name:Test4  Value:FourthTest | Value listed in template file under Software\_deleted |  |  |
| 16 | Ensure scanner detects value modification in HKCU | Use regedit to modify a value directly under HKCU\Printers  Type: REG\_MULTI\_SZ  Name:Test5  Value:FifthTest to Edit5 | Value listed in template file under HKCU\_modified |  |  |
| 17 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to deletion a key directly under HKLM/Software/CVSM  Type: REG\_MULTI\_SZ  Name:Test6  Value:SixthTest | Value listed in template file under Software\_deleted |  |  |
| 18 | Ensure scanner detects value modification in HKCU | Use regedit to modify a key directly under HKCU\Printers  Type: REG\_EXPAND\_SZ  Name:Test7  Value:SeventhTest to Edit7 | Value listed in template file under HKCU\_modified |  |  |
| 19 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to delete a key directly under HKLM/Software/Google/TestKey  Type: REG\_EXPAND\_SZ  Name:Test8  Value:EightTest | Value listed in template file under Software\_deletion |  |  |
| 20 | Ensure scanner detects value modification in HKCU | Use regedit to modify a key directly under HKCU\Printers  Type: REG\_DWORD  Name:Test9  Value:NinthTest to Edit9 | Value listed in template file under HKCU\_modified |  |  |
| 21 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to delete a key directly under HKLM/Software/Google  Type: REG\_DWORD  Name:Test10  Value:TenthTest | Value listed in template file under Software\_deleted |  |  |
| 22 | Ensure scanner detects value deletion in HKCU | Use regedit to delete a key directly under HKCU\Printers  Type: REG\_BINARY  Name:Test11  Value:EleventhTest | Value listed in template file under HKCU\_deleted |  |  |
| 23 | Ensure scanner detects value modification in HKLM/Software | Use regedit to modify a key directly under HKLM/Software/Google  Type: REG\_BINARY  Name:Test12  Value:Twelfth Test to Edit12 | Value listed in template file under Software\_modified |  |  |

## WxPython Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that running the WxPython application starts the Eel application | N/A | The browser window with the Eel UI opens |  |  |
| 2 | To ensure pressing Minimise removes the browser window from the user’s screen | N/A | The browser window leaves the screen |  |  |
| 3 | To ensure pressing Maximise brings the browser window back to the user’s screen | N/A | The browser window returns to the screen |  |  |
| 4 | To ensure that pressing Maximise while the window is maximised does not crash the program | N/A | Nothing happens |  |  |
| 5 | To ensure that pressing minimise while the window is minimised does not crash the program | N/A | Nothing happens |  |  |

## Eel Interface Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that pressing “Start File Scan” starts the file scan | N/A | Console outputs that scan has begun, alert window pops up on the browser window |  |  |
| 2 | To ensure that pressing “Start Registry Scan” begins the registry scan and ends the file scan | N/A | Console outputs that scan has begun, alert window pops up on the browser window  Template file created |  |  |
| 3 | To ensure that inputting a name to the browser UI causes the template file to named according to the input | Input “TestTemplateName” into the textbox  Press start file scan and then start registry scan | Template file is named appropriately |  |  |
| 4 | To ensure that inputting an incorrect value to the browser UI does not allow the scanner to start | Don’t input anything into the input box | Popup informs user that they need to input a name for the program |  |  |

## Backup Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure all files from an installation are copied to the backup folder | Activate the file scanner with name “TestBackup” and then create 3 files:  BackupTest1.txt,  TestBackup2.sql and Test3Backup.pdf  Activate backup program, select backup and input TestBackup when prompted | All three files are backed up to Documents/TestBackup |  |  |
| 2 | To ensure that the program doesn’t crash when an incorrect FileTemplate name | TemplateName:sfgjhwesrfsjhifg | Program rejects the input as incorrect without crashing |  |  |
| 3 | To ensure that a file from the template being deleted doesn’t crash the backup | Same as one, but delete BackupTest1.txt after scanning | Program continues without crashing |  |  |

## Restore Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that the restore function successfully restores installation files from the backup | Same as Backup Test One, but add 2 registry keys during installation, and then delete them | Registry keys are restored to the hive, files are restored to their original location |  |  |
| 2 | To ensure that the program doesn’t crash if some of the files and registry values being restored still exist in their original location | Same as previous, but delete only one registry key and file | Restoration is successful, program doesn't crash |  |  |

## Full System Test

For the full system test, run through scanning and backup, then uninstall the program and run through restoration. The test is successful if it runs after deletion and restoration, and fails if the program cannot start

# Tests

## File System Scanner Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | Ensure File Scanner detects a file being created | Type echo “test data” > testFile.txt  Into the command line | Template file contains the path for the created file under files\_created | Success | N/A |
| 2 | Ensure that file scanner detects a file being modified | Open a text file and change the contents | Template file contains the path for the modified file under files\_modified | Success | File registered as both created and modified, I think because of how windows edits txt file |
| 3 | Ensure that file scanner detects a file being deleted | Delete a file | Template file contains the path for the deleted file under files\_deleted | Failure | File shows up as modified rather than deleted, may be a windows thing, I’ll have to see |
| 4 | Ensure file scanner ignores file creation in a directory that is part of the file filter | Create a file in Appdata\Roaming\JetBrains | Template file does not contain the file creation | Success | N/A |
| 5 | Ensure file scanner ignores file modification in a directory that is part of the file filter | Modify a file in Appdata\Roaming\JetBrains | Template file does not contain the file modification | Success | N/A |
| 6 | Ensure file scanner ignores file deleted in a directory that is part of the file filter | Delete a file in Appdata\Roaming\JetBrains | Template file does not contain the file deletion |  |  |

## Registry Scanner Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | Ensure scanner detects key creation in HKCU | Use regedit to create a key directly under HKCU\Printers  KeyName: KeyToTest | Key listed in template file under HKCU\_created | Success |  |
| 2 | Ensure scanner detects key creation in HKLM/Software | Use regedit to create a key directly under HKLM/Software/Google  Key Name:TestKey | Key listed in template file under Software\_created | Success |  |
| 3 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers\KeyToTest  Type: REG\_SZ  Name:Test3  Value:ThirdTest | Value listed in template file under HKCU\_created | Success |  |
| 4 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google/TestKey  Type: REG\_SZ  Name:Test4  Value:FourthTest | Value listed in template file under Software\_created | Success |  |
| 5 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_MULTI\_SZ  Name:Test5  Value:FifthTest | Value listed in template file under HKCU\_created | Success |  |
| 6 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/CVSM  Type: REG\_MULTI\_SZ  Name:Test6  Value:SixthTest | Value listed in template file under Software\_created | Success |  |
| 7 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_EXPAND\_SZ  Name:Test7  Value:SeventhTest | Value listed in template file under HKCU\_created | Success |  |
| 8 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google/TestKey  Type: REG\_EXPAND\_SZ  Name:Test8  Value:EightTest | Value listed in template file under Software\_created | Success |  |
| 9 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_DWORD  Name:Test9  Value:12 | Value listed in template file under HKCU\_created | Success |  |
| 10 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google  Type: REG\_DWORD  Name:Test10  Value:e | Value listed in template file under Software\_created | Success |  |
| 11 | Ensure scanner detects value creation in HKCU | Use regedit to create a value directly under HKCU\Printers  Type: REG\_BINARY  Name:Test11  Value:10100101111100 | Value listed in template file under HKCU\_created | Success |  |
| 12 | Ensure scanner detects value creation in HKLM/Software | Use regedit to create a value directly under HKLM/Software/Google  Type: REG\_BINARY  Name:Test12  Value:00010010101010 | Value listed in template file under Software\_created | Success |  |
| 13 | Ensure scanner ignores filter values | Add a value to a key that exists in the filter file | No value listed in template file | Success |  |
| 14 | Ensure scanner detects value modification in HKCU | Use regedit to modify a value directly under HKCU\Printers\KeyToTest  Type: REG\_SZ  Name:Test3  Value:ThirdTest to Edit14 | Value listed in template file under HKCU\_modified | Success |  |
| 15 | Ensure scanner detects value deleted in HKLM/Software | Use regedit to delete a value directly under HKLM/Software/Google/TestKey  Type: REG\_SZ  Name:Test4  Value:FourthTest | Value listed in template file under Software\_deleted | Success |  |
| 16 | Ensure scanner detects value modification in HKCU | Use regedit to modify a value directly under HKCU\Printers  Type: REG\_MULTI\_SZ  Name:Test5  Value:FifthTest to Edit5 | Value listed in template file under HKCU\_modified | Success |  |
| 17 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to delete a key directly under HKLM/Software/CVSM  Type: REG\_MULTI\_SZ  Name:Test6  Value:SixthTest | Value listed in template file under Software\_deleted | Success |  |
| 18 | Ensure scanner detects value modification in HKCU | Use regedit to modify a key directly under HKCU\Printers  Type: REG\_EXPAND\_SZ  Name:Test7  Value:SeventhTest to Edit7 | Value listed in template file under HKCU\_modified | Success |  |
| 19 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to delete a key directly under HKLM/Software/Google/TestKey  Type: REG\_EXPAND\_SZ  Name:Test8  Value:EightTest | Value listed in template file under Software\_deletion | Success |  |
| 20 | Ensure scanner detects value modification in HKCU | Use regedit to modify a key directly under HKCU\Printers  Type: REG\_DWORD  Name:Test9  Value:12 to 14 | Value listed in template file under HKCU\_modified | Success |  |
| 21 | Ensure scanner detects value deletion in HKLM/Software | Use regedit to delete a key directly under HKLM/Software/Google  Type: REG\_DWORD  Name:Test10  Value:e to a | Value listed in template file under Software\_deleted | Success |  |
| 22 | Ensure scanner detects value deletion in HKCU | Use regedit to delete a key directly under HKCU\Printers  Type: REG\_BINARY  Name:Test11  Value:1010001111100 to 1010 | Value listed in template file under HKCU\_deleted | Success |  |
| 23 | Ensure scanner detects value modification in HKLM/Software | Use regedit to modify a key directly under HKLM/Software/Google  Type: REG\_BINARY  Name:Test12  Value:00010010101010 to 1111 | Value listed in template file under Software\_modified | Success |  |

## WxPython Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that running the WxPython application starts the Eel application | N/A | The browser window with the Eel UI opens | Success |  |
| 2 | To ensure pressing Minimise removes the browser window from the user’s screen | N/A | The browser window leaves the screen | Success |  |
| 3 | To ensure pressing Maximise brings the browser window back to the user’s screen | N/A | The browser window returns to the screen | Success |  |
| 4 | To ensure that pressing Maximise while the window is maximised does not crash the program | N/A | Nothing happens | Success |  |
| 5 | To ensure that pressing minimise while the window is minimised does not crash the program | N/A | Nothing happens | Success |  |

## Eel Interface Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that pressing “Start File Scan” starts the file scan | N/A | Console outputs that scan has begun, alert window pops up on the browser window | Success |  |
| 2 | To ensure that pressing “Start Registry Scan” begins the registry scan and ends the file scan | N/A | Console outputs that scan has begun, alert window pops up on the browser window  Template file created | Success |  |
| 3 | To ensure that inputting a name to the browser UI causes the template file to named according to the input | “TestTemplateName”  Press start file scan and then start registry scan | Template file is named appropriately | Success |  |
| 4 | To ensure that inputting an incorrect value to the browser UI does not allow the scanner to start | Don’t input anything into the input box | Popup informs user that they need to input a name for the program | Success |  |

## Backup Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure all files from an installation are copied to the backup folder | Activate the file scanner with name “TestBackup” and create 3 files:  BackupTest1.txt,  TestBackup2.sql and Test3Backup.pdf  Activate backup program, select backup and input TestBackup when prompted | All three files are backed up to Documents/TestBackup | Success |  |
| 2 | To ensure that the program doesn’t crash when an incorrect FileTemplate name | TemplateName:sfgjhwesrfsjhifg | Program rejects the input as incorrect without crashing | Failure | No try-catch for backup function, once added, test passed |
| 3 | To ensure that a file from the template being deleted doesn’t crash the backup | Same as one, but delete BackupTest1.txt after scanning | Program continues without crashing | Success |  |

## Restore Tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Number | Test Purpose | Test Data | Expected Outcome | Actual Outcome | Discussion of Outcome |
| 1 | To ensure that the restore function successfully restores installation files from the backup | Same as Backup Test One, but add 2 registry keys during installation, and then delete them | Registry keys are restored to the hive, files are restored to their original location | Failure | Files created, registry keys were not restored. When there was no value for a key value, winreg was returning 0 rather than an empty string. I fixed it, and the test was successful |
| 2 | To ensure that the program doesn’t crash if some of the files and registry values being restored still exist in their original location | Same as previous, but delete only one registry key and file | Restoration is successful, program doesn't crash | Success |  |

## Full System Test

For the full system test,I ran through the installation, backup and restoration of Musescore. The test would be successful if MuseScore ran after deletion and restoration, and would fail if the program cannot start

The test initially appeared successful, with the templating system working exactly as intended, as did the backup. However, although I was able to restore the program without crashes, there was an error restoring registry keys and when I executed Musescore, it crashed due to an issue finding a file. From research, this appears to be a problem with the PATH variable, which the backup and restore programs do not take into account, because it could easily crash the computer. To see if this was a rare problem, I then installed RemoteMouse, running the system test on it, and it was fully successful. So it seems as though the full system works as long as a program does not both use the PATH variable and remove itself from the PATH variable once it is uninstalled.

The program has now been successfully tested, and has passed the tests given to it.