User Manual

C Path Finder

Sajed Jalil 12/14/18 Software Project

Contents

User Manual

C Path Finder is a unit test case generator intended for C programmers. Therefore, it is assumed that the user has experience of running general IDE.

Minimum System Requirements

Processor - Dual core 2.0 GHz Processor

Ram - 2 GB DDR3

JDK/JRE – 10 or later versions

Hard Disk – Minimum 50 MB available Hard Drive for Installation

Operating System – Windows 7 or higher

Recommended System Requirements

Processor – Intel Core i7 (6th Generation or upwards)

Ram - 8 GB DDR3

JDK/JRE – 10 or later versions

Hard Disk – 100 MB available Hard Drive for Installation

Operating System – Windows 7 or higher

Downloading the installer

Interactive windows Installer can be downloaded from https://github.com/Sajed49/C-Path-Finder/releases/tag/1.0.0.

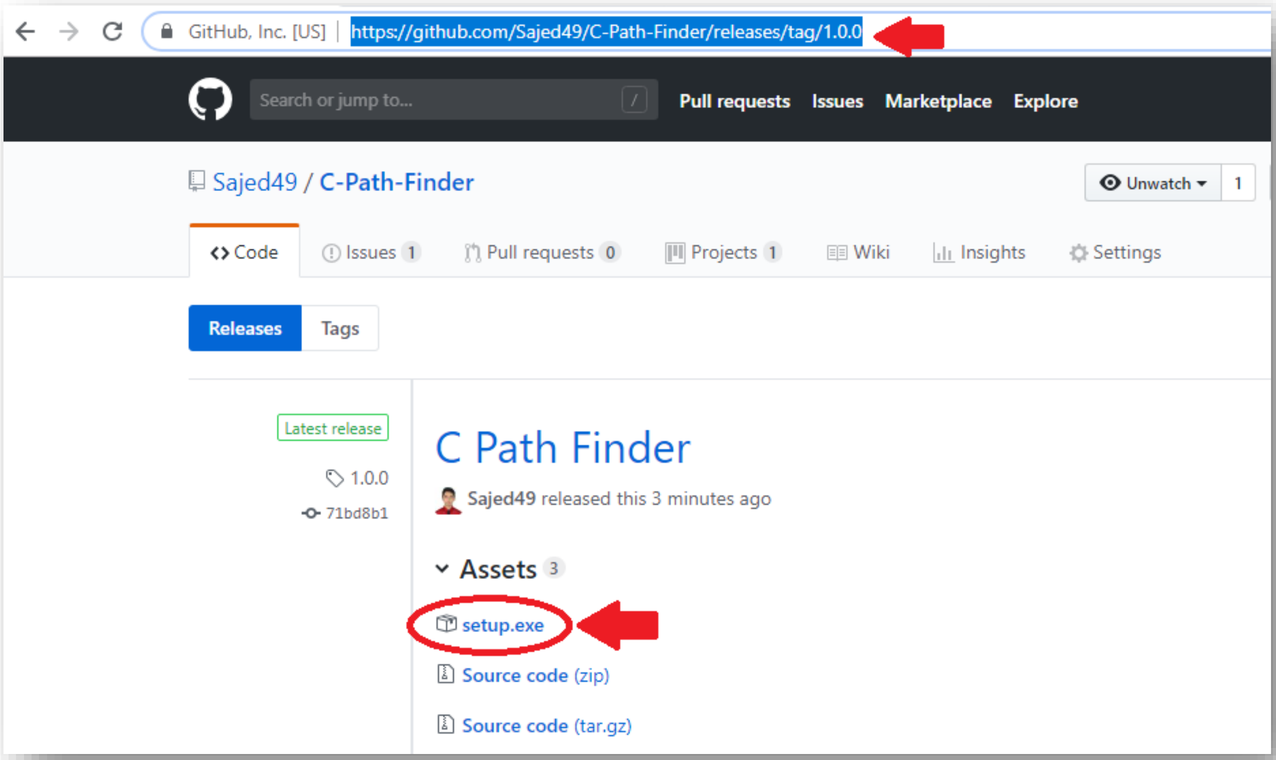
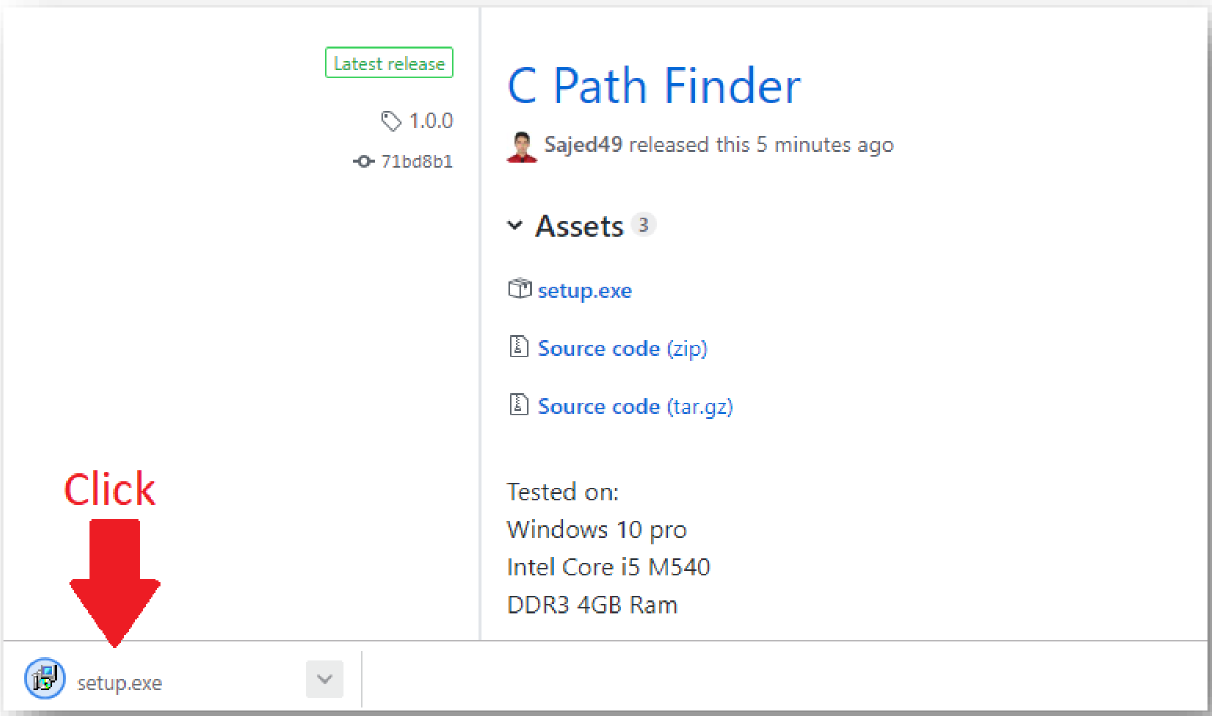


Figure 1: Download from website

Running the Installer

The downloaded installer can be run as windows executable.



C Path Finder

Sajed49 released this 5 minutes ago

Assets 3

setup.exe

Source code (zip)

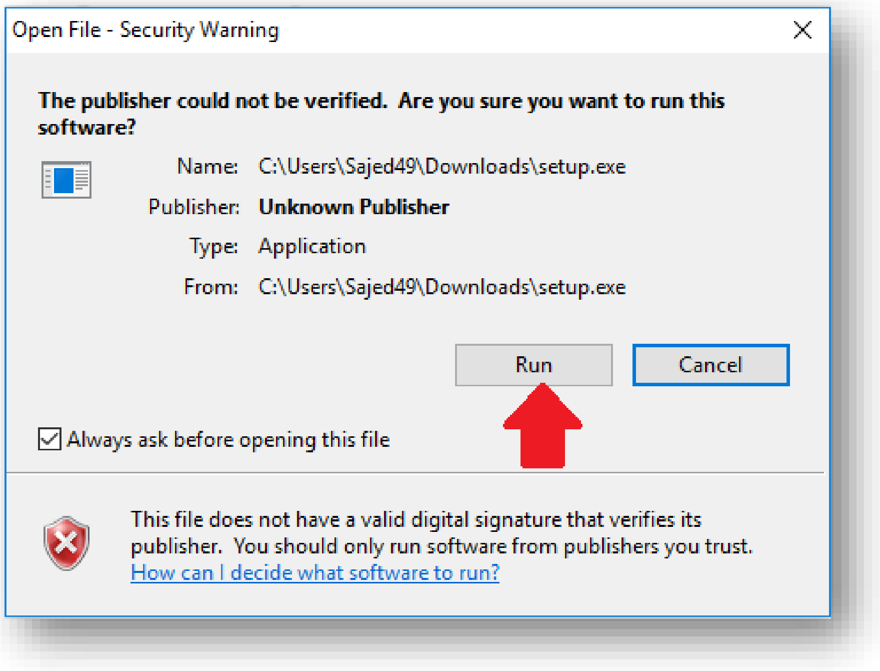
Source code (tar.gz)

Tested on:
Windows 10 pro
Intel Core i5 M540
DDR3 4GB Ram

Figure 2: Executable File

Installing the application

In the following, step by step installation process are shown with figure. The user can customize the installation path as provided in our requirement. Moreover, User can choose whether to create a desktop shortcut icon.



Open File - Security Warning

The publisher could not be verified. Are you sure you want to run this software?

Name: C:\Users\Sajed49\Downloads\setup.exe

Publisher: **Unknown Publisher**

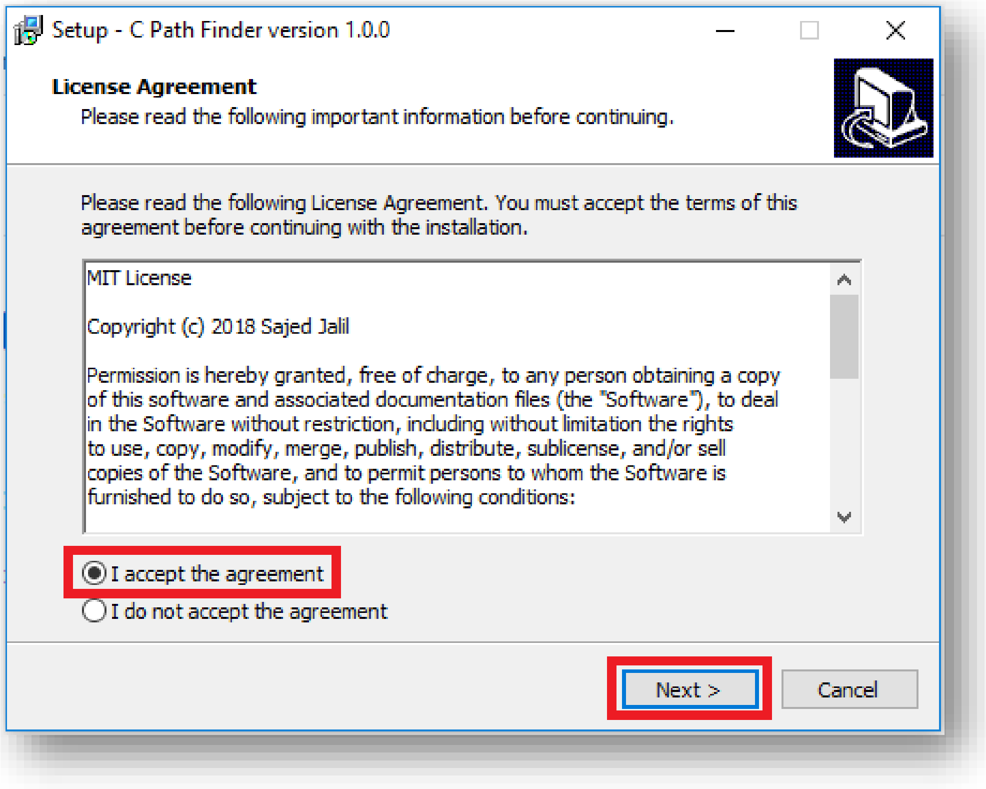
Type: Application

From: C:\Users\Sajed49\Downloads\setup.exe

[✓] Always ask before opening this file

This file does not have a valid digital signature that verifies its publisher. You should only run software from publishers you trust. How can I decide what software to run?

Figure 3: Installation permission 1



Setup - C Path Finder version 1.0.0

License Agreement

Please read the following important information before continuing.

Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.

MIT License

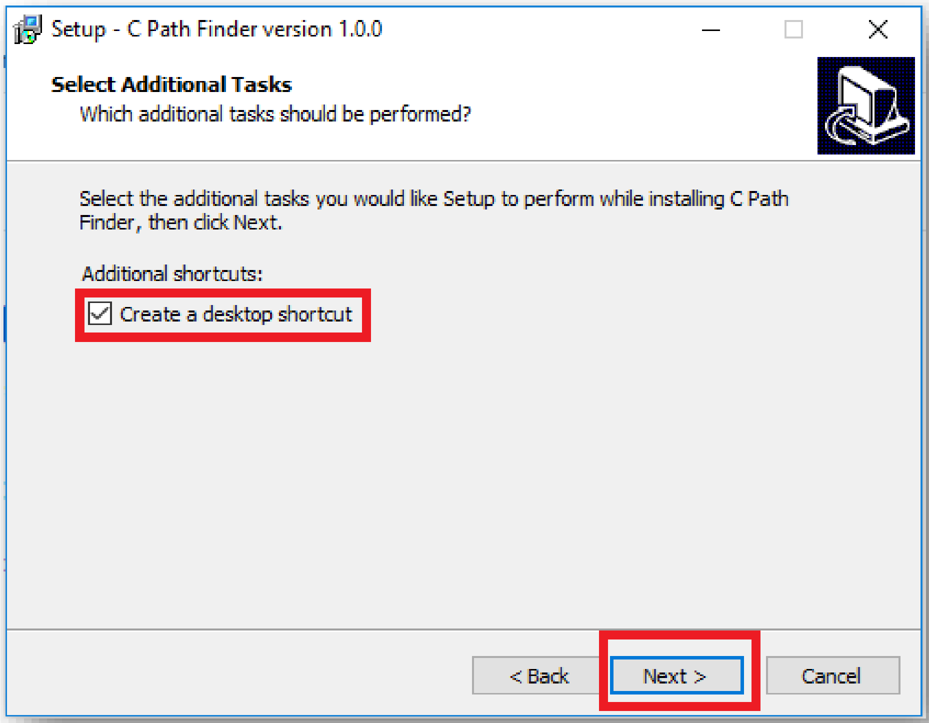
Copyright (c) 2018 Sajed Jalil

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

● I accept the agreement

○ I do not accept the agreement

Figure 4: License Agreement


Setup - C Path Finder version 1.0.0

Select Additional Tasks

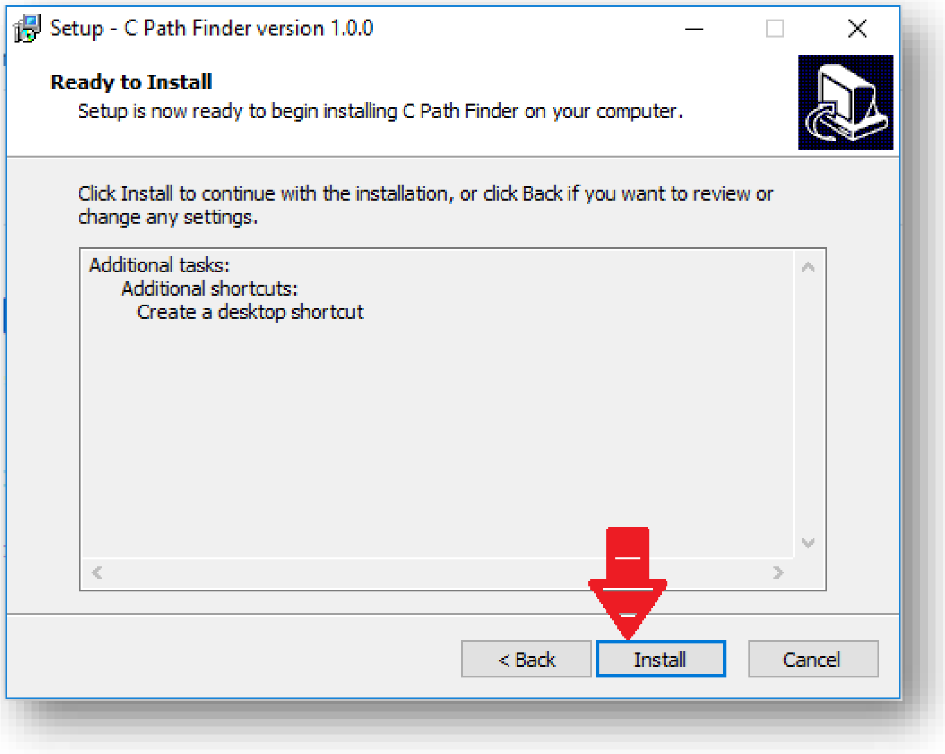
Which additional tasks should be performed?

Select the additional tasks you would like Setup to perform while installing C Path Finder, then click Next.

Additional shortcuts:

☑ Create a desktop shortcut

Figure 5: Desktop Shortcut


Setup - C Path Finder version 1.0.0

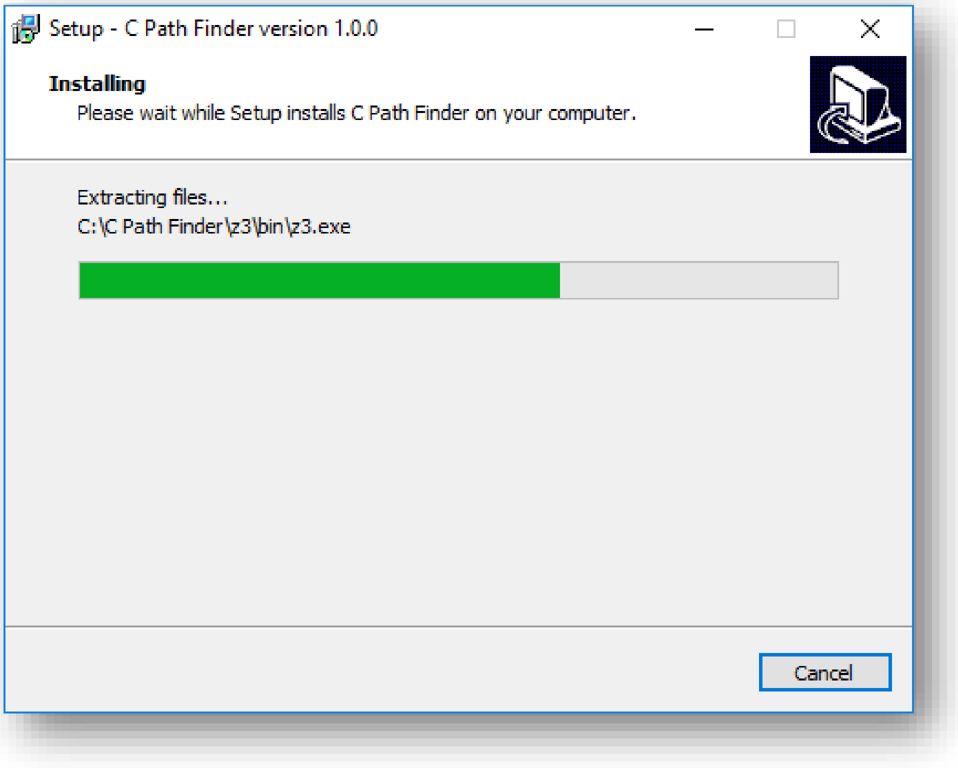
Ready to Install

Setup is now ready to begin installing C Path Finder on your computer.

Click Install to continue with the installation, or click Back if you want to review or change any settings.

Additional tasks:
    Additional shortcuts:
        Create a desktop shortcut

Figure 6: Install button

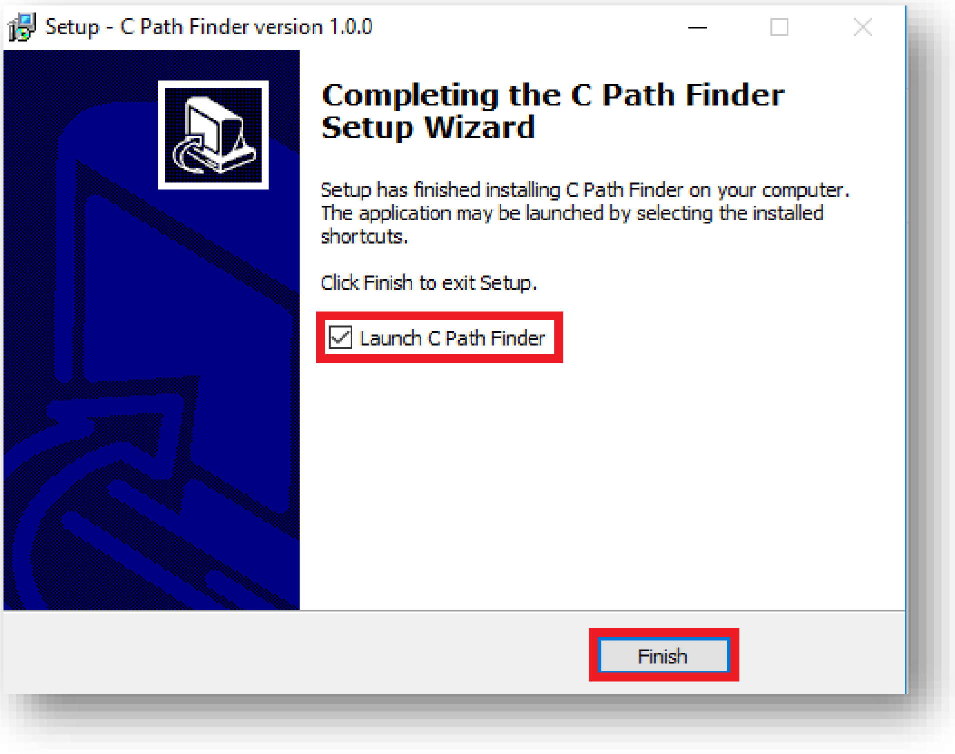

Setup - C Path Finder version 1.0.0

Installing

Please wait while Setup installs C Path Finder on your computer.

Extracting files...
C:\C Path Finder\z3\bin\z3.exe

Figure 7: Installation on progress


Setup - C Path Finder version 1.0.0

Completing the C Path Finder Setup Wizard

Setup has finished installing C Path Finder on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

Figure 8: Installation completed

Add path up to z3/bin/ from the installation directory to the system path variable of windows.

Running the Application

The application can be launched from desktop shortcut or the installation directory.

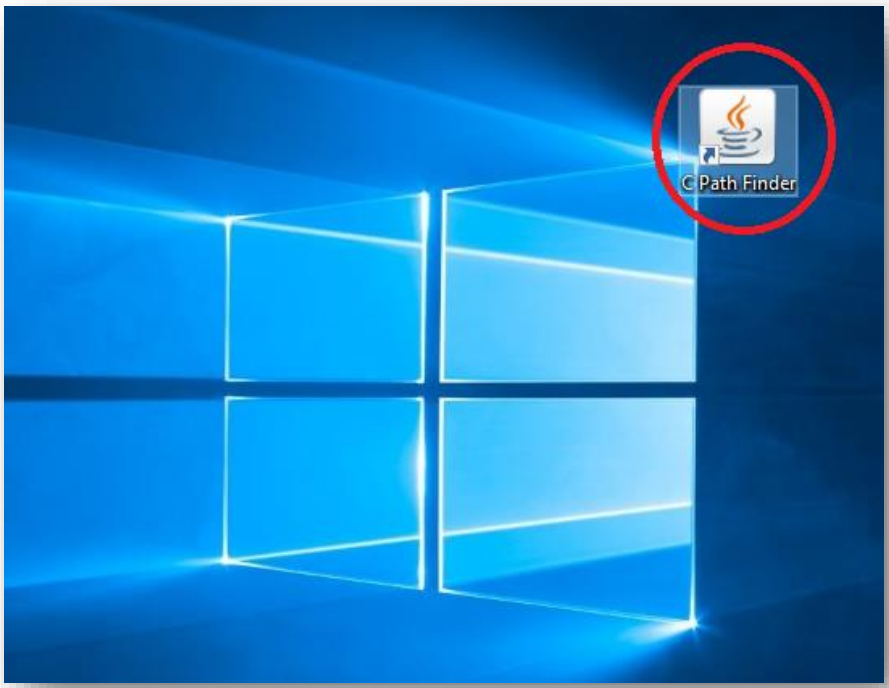


Figure 9: Launching from shortcut icon

From the **File** option we can open system explorer. From the **Settings** we can change the result generation directory. **Tutorial** menu opens the user manual for the application. To import the test files, we simple have to click the **select** button.

After selection a system explorer view will pop up. Form there we have to select the input directory where C source codes are located. In our example, the folder is located in C drive named as **test**.

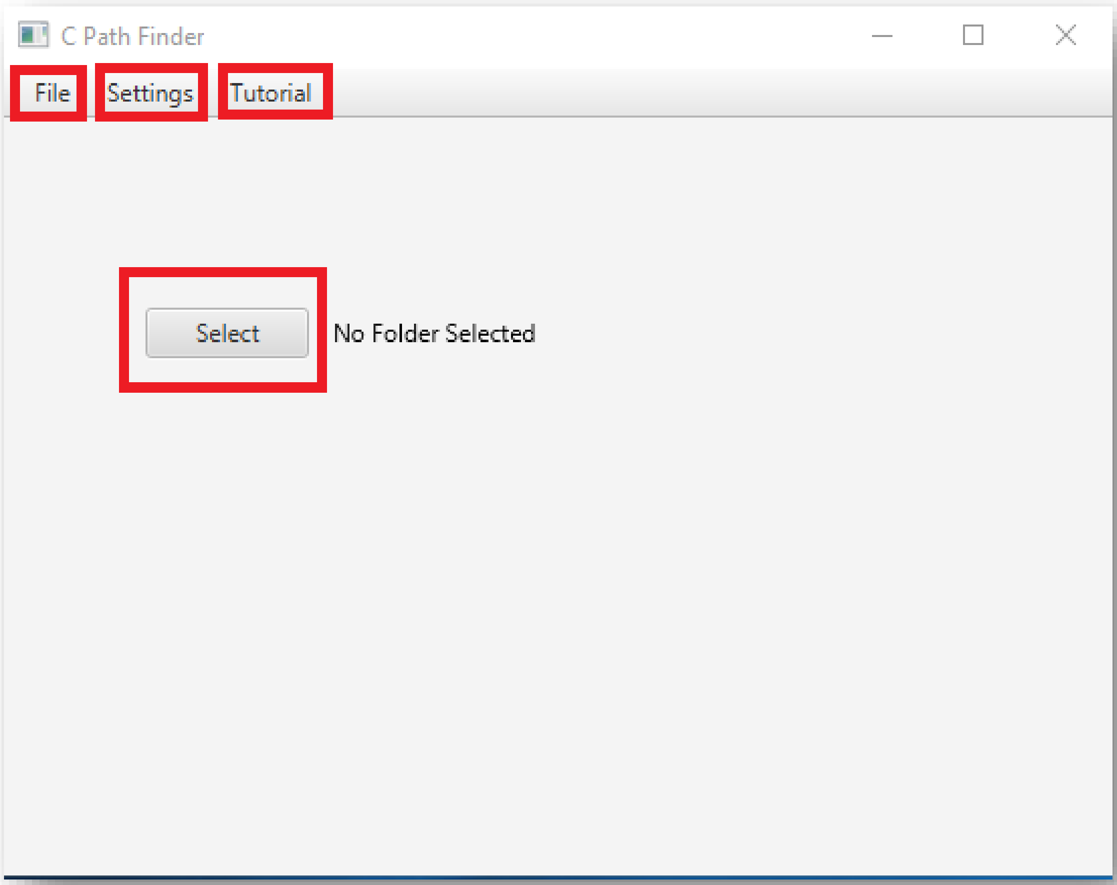
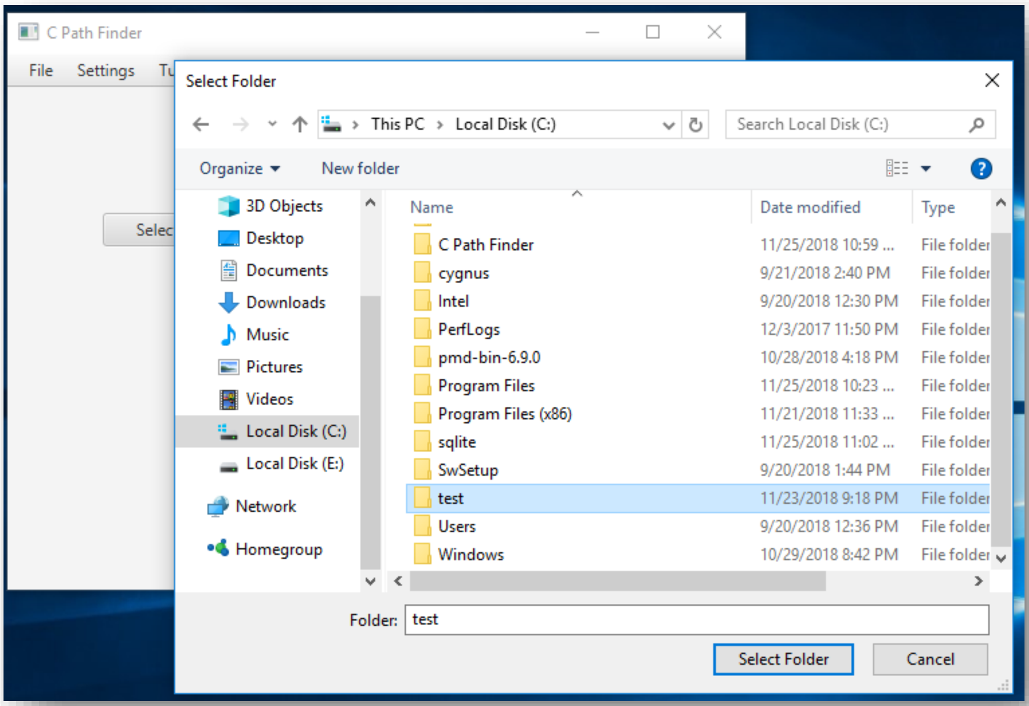


Figure 10: Application basics



Name	Date modified	Type
C Path Finder	11/25/2018 10:59 ...	File folder
cygnus	9/21/2018 2:40 PM	File folder
Intel	9/20/2018 12:30 PM	File folder
PerfLogs	12/3/2017 11:50 PM	File folder
pmd-bin-6.9.0	10/28/2018 4:18 PM	File folder
Program Files	11/25/2018 10:23 ...	File folder
Program Files (x86)	11/21/2018 11:33 ...	File folder
sqlite	11/25/2018 11:02 ...	File folder
SwSetup	9/20/2018 1:44 PM	File folder
test	11/23/2018 9:18 PM	File folder
Users	9/20/2018 12:36 PM	File folder
Windows	10/29/2018 8:42 PM	File folder

Figure 11: Source File Selection

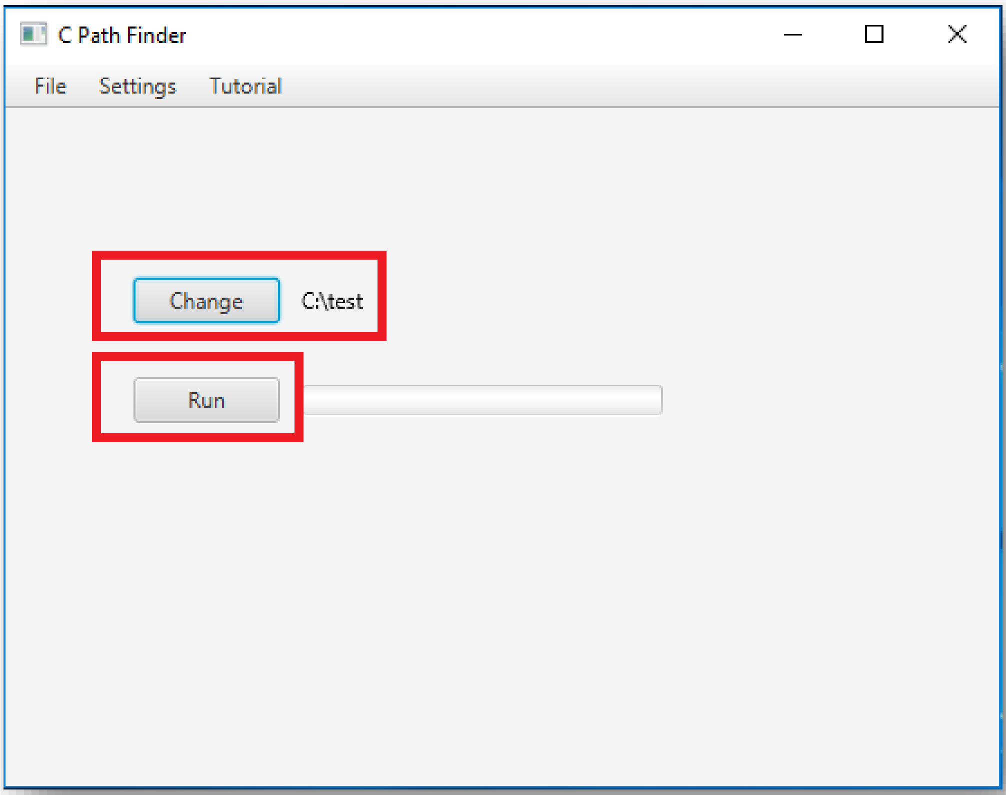


Figure 12: Running Source Files

After selection, we can change the test files or run the test files. When the processing is completed, the progress bar will be filled and a new button named open result will be shown. WE can re-run the source files. In that case, run will use **memorized execution** technique. **Open Result** button will pop up the result directory containing testcases in txt file format.

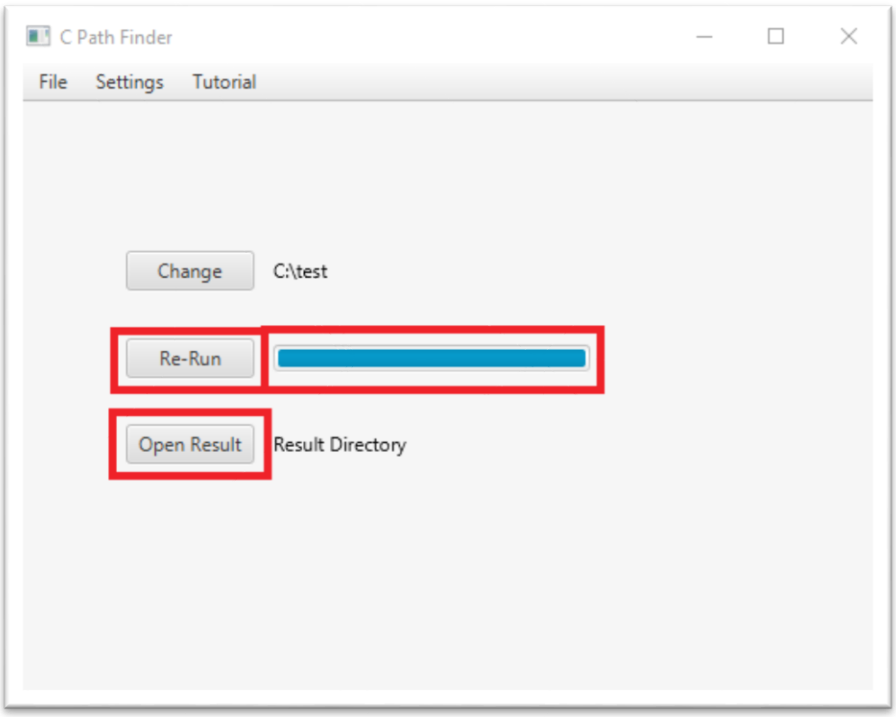


Figure 13: Progress Bar and Result

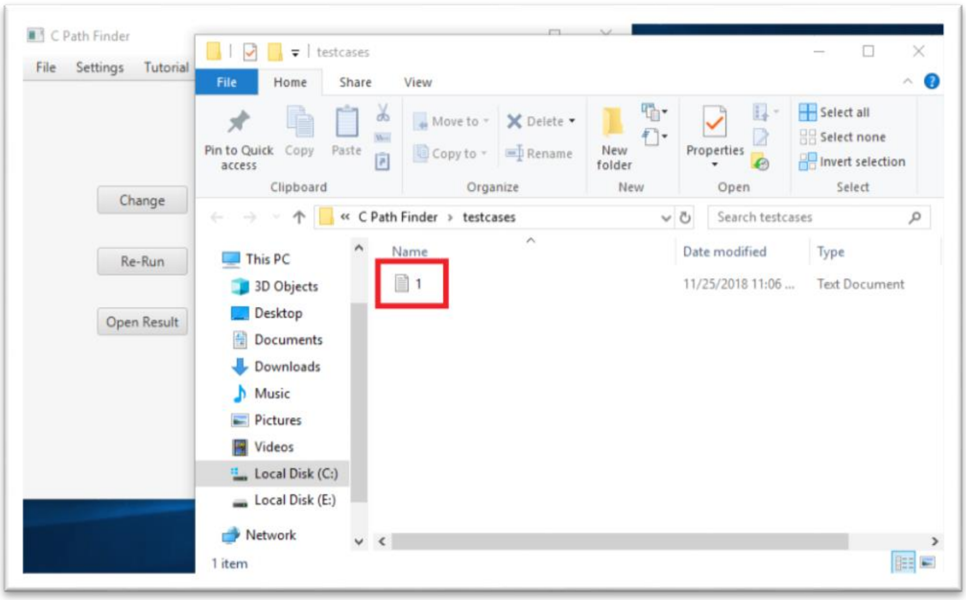
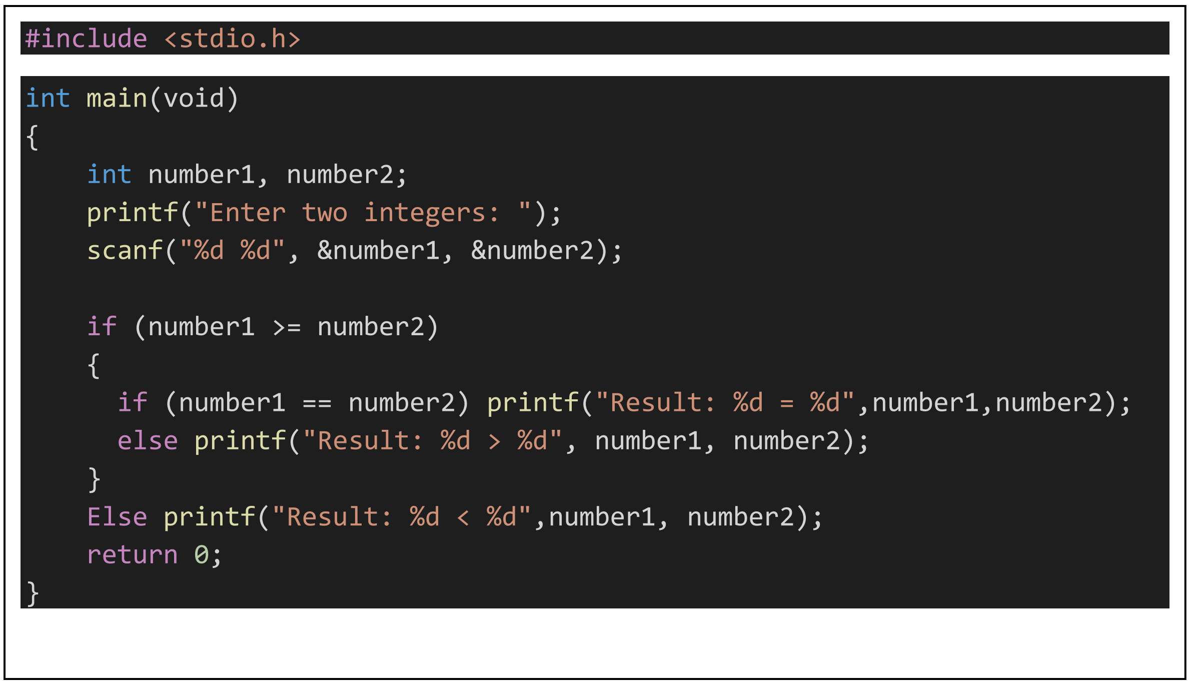


Figure 14: Result Output Directory

This figure below shows the sample test code for the file name 1.c . The source code had three possible paths. WE can see in the next result figure that our program could completely detect three paths and successfully generated test case that traverse these three paths.

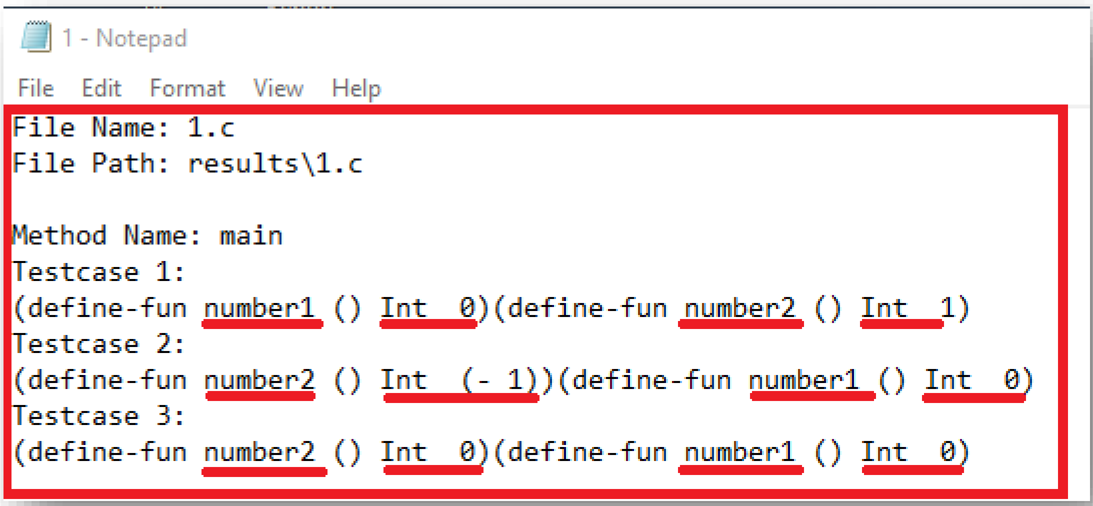


```
#include <stdio.h>

int main(void)
{
    int number1, number2;
    printf("Enter two integers: ");
    scanf("%d %d", &number1, &number2);

    if (number1 >= number2)
    {
      if (number1 == number2) printf("Result: %d = %d",number1,number2);
      else printf("Result: %d > %d", number1, number2);
    }
    Else printf("Result: %d < %d",number1, number2);
    return 0;
}
```

Figure 15: Input Test Code



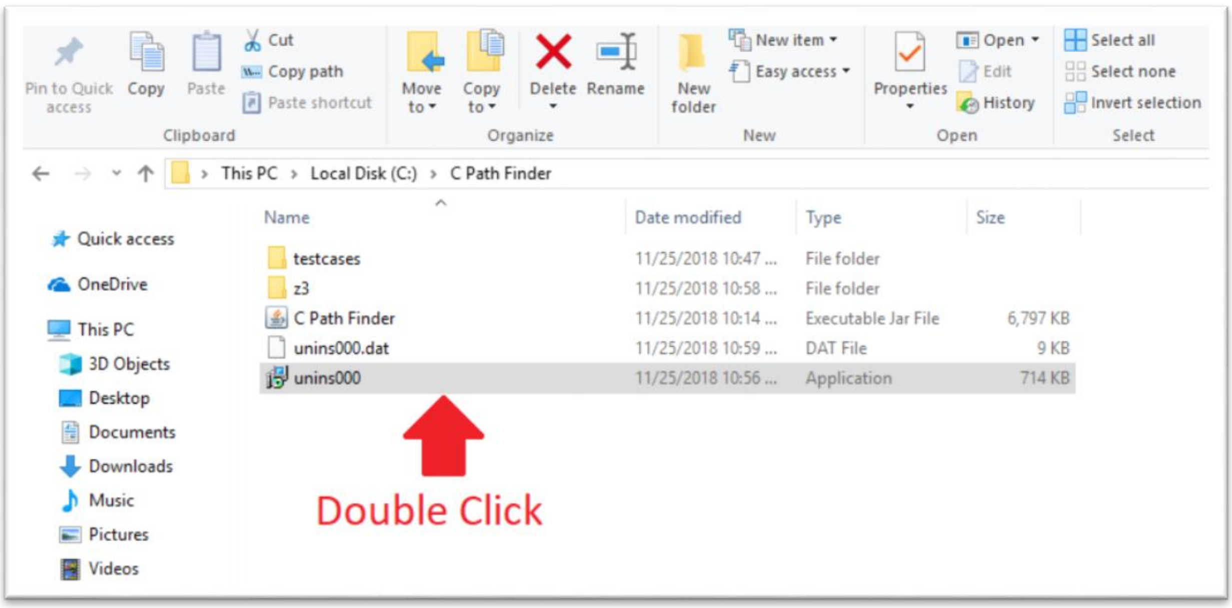
```
File Name: 1.c
File Path: results\1.c

Method Name: main
Testcase 1:
(define-fun number1 () Int  0)(define-fun number2 () Int  1)
Testcase 2:
(define-fun number2 () Int  (- 1))(define-fun number1 () Int  0)
Testcase 3:
(define-fun number2 () Int  0)(define-fun number1 () Int  0)
```

Figure 16: Generated Test Cases

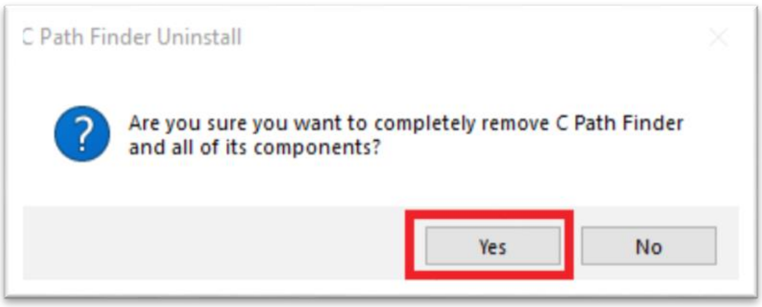
Uninstalling the Application

Besides interactive installation feature, we have also added uninstallation feature in our application. The following shows the steps of uninstallation process.



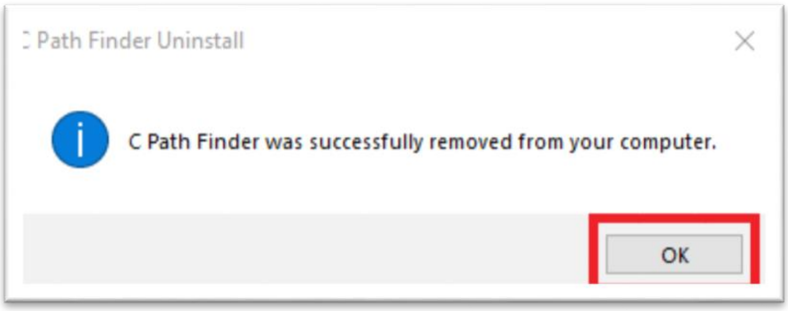
Name	Date modified	Type	Size
testcases	11/25/2018 10:47 ...	File folder	
z3	11/25/2018 10:58 ...	File folder	
C Path Finder	11/25/2018 10:14 ...	Executable Jar File	6,797 KB
unins000.dat	11/25/2018 10:59 ...	DAT File	9 KB
unins000	11/25/2018 10:56 ...	Application	714 KB

Figure 17: Uninstallation Steps



Are you sure you want to completely remove C Path Finder and all of its components?

Figure 18: Confirm Uninstallation



C Path Finder was successfully removed from your computer.

Figure 19: Uninstallation Completed

Troubleshoot

1. For any test generation related problems, please uninstall the application and install again.
2. Logs can be viewed for deeper insight.
3. For further problems, please raise an issue in GitHub repository or mail us at bsse0714@iit.du.ac.bd