

Implementing g95 compiler in Windows XP

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This document is intended to guide you in setting up your g95 compiler in a Windows XP environment.

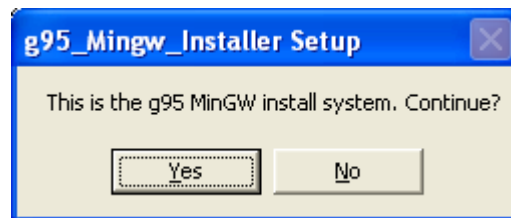
Getting g95

To get g95 visit: <http://www.g95.org/> Click on the link [Download binaries, source and manual](#) to download the *G95 Manual* and the *Self-extracting Windows x86* files. The installation file is called *g95-MinGW.exe*.

Installing g95

Copy the file *g95-MinGW.exe* into your *c:* directory, then double-click on it. (Note: while you can install g95 anywhere in your harddisk, it is recommended that you avoid file specifications with spaces when installing the software. Thus, avoid placing the g95 software in the *Program Files* directory provided by *Windows*. For that reason I recommend that you copy *g95-MinGW.exe* into your *c:* directory).

After double-clicking on you will be asked the following question:



Press [Yes] . Use the [Browse] button to select your destination folder. I placed mine in *c:\g95*, i.e.,

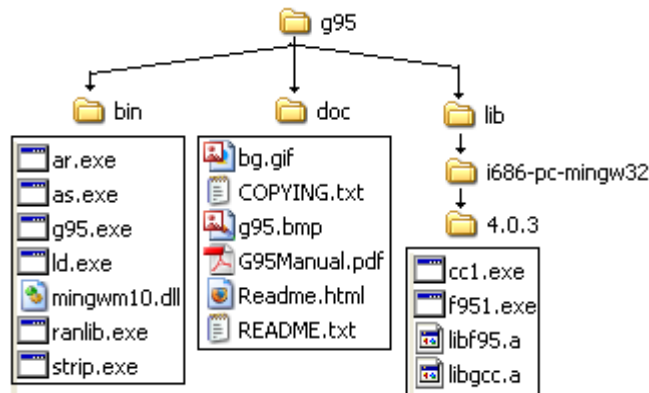


Press [Install]. During installation you'll be asked the following questions:

- Install MinGW utilities and libs? Answer: [OK]
- Set PATH=C:\g95\bin, & LIBRARY_PATH=C:\g95\lib? (Recommended) Answer: [OK]
- Set Library Path for all users? Answer [Yes] if you want everyone to have access to it.
- Open README.txt now? [OK] if you want to read the information. [Cancel], otherwise.
- Press [OK] after receiving the “sucessful installation” message.

Checking contents of c:\g95

Find the c:\g95 folder and verify that it contains the folders and sub-folders shown in the first figure in next page.



Getting an editor for g95

In order to type Fortran source code you need a text editor. Visit

http://sourceforge.net/project/showfiles.php?group_id=45545

and download *Programmer's Notepad*.

Open the *Programmer's Notepad* program and select *View>Change Scheme > Fortran 95* to select the syntax scheme for Fortran. Also, select *View>Line Numbers* to show the line numbers of the files. An example of a Fortran 95 file in *Programmer's Notepad* is shown below.

```
1 PROGRAM circle
2   IMPLICIT NONE
3
4   ! This program calculates the equation of a circle
5   ! passing through three points
6
7   ! variable declarations
8   REAL :: x1, y1, x2, y2, x3, y3, a, b, r
9
10
11  ! Step 1
12  PRINT *, "Please type the coordinates of the three points"
13  PRINT *, "in the order x1,y1,x2,y2,x3,y3"
14  READ *, x1,y1,x2,y2,x3,y3
15
16  ! Step 2
17  CALL calculate_circle(x1,y1,x2,y2,x3,y3,a,b,r)
18
19  ! Step 3
20  PRINT *, "The centre of the circle through these points is &
21  |      | &("a","b","r")"
22  PRINT *, "Its radius is ",r
23
24  END PROGRAM circle
```

Documentation on g95

Click on the *Documentation* link in <http://www.g95.org/> to download documentation on the use of g95. Some links of interest are: *Running G95*, *How to link g95 programs with MATLAB*, *How to interface with SCILAB*.

Creating icons for g95 operation

Create a folder called *g95Icons* within the *c: g95* directory to contain icons that activate the most commonly used programs related to g95 operation. Open this folder and create shortcuts to the following programs: *Command Prompt* and *Programmer's Notepad*

To create a shortcut for the command prompt (to be named *g95*):

1. Right-click on any open area of a folder, and select *New>Shortcut* from the resulting menu.
2. A *Create Shortcut* wizard appears. Click on the [Browse...] button and select the program to be linked to the shortcut. For example, for the *Command Prompt* type:
C:\WINDOWS\SYSTEM32\CMD.EXE
3. Press [Next>]
4. For the short cut name type "g95"
5. Press [Finish]
6. Right-click on the *g95* icon, and select *Properties*
7. In the *Start in:* field, type: *C:\g95\bin*

To create a shortcut for the *Programmer's Notepad*:

1. Select *Start > All Programs > Programmer's Notepad > Programmer's Notepad 2*
2. Right-click on the program and select *Create Shortcut* from the resulting menu.
3. Select *Start > All Programs > Programmer's Notepad > Programmer's Notepad 2 (2)*
4. Hold the left mouse button and drag the icon to the *C:\g95\g95Icons* folder
5. Edit the Icon name to read *Programmer's Notepad 2*

To modify the properties of the command prompt double-click on the *g95* command prompt icon and open the corresponding command window. The resulting window is the traditional black-background *Windows* command window. You can improve the appearance of this window by following these suggestions:

1. Click on the [c:\](#) icon on the upper left corner of the window, and select the option *Properties*.
2. Click on the *Options* tab, and change the *Buffer Size* to 999 and the *Number of Buffers* to 999.
3. Click on the *Font* tab, and change the font to *Lucida Console*, Size12.
4. Click on the *Layout* tab, and change the *Screen Buffer Size* to *Width = 120*, and *Height = 600*, and the *Window Size* to *Width = 120*, and *Height = 50*.
5. Click on the *Colors* tab, and select, for example, the fourth color (bluish-green) for *Screen Background* and white for the *Screen Text*.
6. Press [OK]
7. Select *Modify shortcut that started this window* to ensure the changes apply everytime you use the *g95* command window link.

Compiling with g95

To compile using *g95* the source file must be in the same directory as *g95.exe*, i.e., at *C:\g95\bin*. For example, launch *Programmer's Notepad* by double-clicking on the corresponding icon, and type the following file:

```
PROGRAM aList
! This program produces a list of numbers
  REAL a, b
  INTEGER k
! "do" loop to produce the list
DO k = 1,10
  a = 1.2 + (k-1)*0.4
  b = sqrt(1+a**2)
  PRINT*, a, b
END DO
END PROGRAM
```

Save the file as *C:\g95\bin\alList.f95*

Next, launch the *g95* command window, and type:

dir <Enter>

to produce a listing of the files available:

```
C:\g95\bin>dir
Volume in drive C has no label.
Volume Serial Number is 9813-3AE6

Directory of C:\g95\bin

08/29/2007  09:13 PM    <DIR>          .
08/29/2007  09:13 PM    <DIR>          ..
08/29/2007  09:13 PM                261 alList.f95
02/04/2007  04:04 AM            446 464 ar.exe
02/04/2007  04:04 AM            679 936 as.exe
08/24/2007  07:44 PM            123 165 g95.exe
02/04/2007  04:04 AM            703 488 ld.exe
03/25/2007  07:47 PM            15 934 mingwm10.dll
02/04/2007  04:04 AM            446 976 ranlib.exe
02/04/2007  04:04 AM            622 592 strip.exe
           8 File(s)          3 038 816 bytes
           2 Dir(s)  14 979 072 000 bytes free
```

The third line shows the file you just typed: 08/29/2007 09:13 PM 261 alList.f95

Next, type:

g95 alList.f95 -o alList.exe <Enter>

Type

dir <enter>

again and make sure that the file *alList.exe* is listed.

To run the program, type

aList <return>

The result is the list:

```
C:\g95\bin>aList
1.2 1.56205
1.6 1.8867962
2. 2.236068
2.4 2.6000001
2.8000002 2.973214
3.2 3.352611
3.6000001 3.7363086
4. 4.1231055
4.4 4.5122056
4.8 4.9030604
```

Compiling a program and a subroutine in a separate folder

Within the *C:\g95* directory create a folder called *MyPrograms*. Within the *MyPrograms* folder create a folder called *Circles*. Open the *Programmer's Notepad* interface. Select *File > New > Fortran 95* to create a new file. Type the following file in *Programmer's Notepad*:

```
PROGRAM circle
  IMPLICIT NONE

  ! This program calculates the equation of a circle
  ! passing through three points

  ! Variable declarations
  REAL :: x1, y1, x2, y2, x3, y3, a, b, r

  ! Step 1
  PRINT *, "Please type the coordinates of the three points"
  PRINT *, "in the order x1,y1,x2,y2,x3,y3"
  READ *, x1, y1, x2, y2, x3, y3

  ! Step 2
  CALL calculate_circle(x1, y1, x2, y2, x3, y3, a, b, r)

  ! Step 3
  PRINT *, "The centre of the circle through these points is &
    &(", a, ",", "b,")"
  PRINT *, "Its radius is ", r

END PROGRAM circle
```

Save the file under the name *C:\g95\MyPrograms\Circles\circle.f95*.

Open a new file in *Programmer's Notepad* and type the following file:

```
SUBROUTINE calculate_circle(xx1,yy1,xx2,yy2,xx3,yy3,aa,bb,rr)
  ! This subroutine calculates the coordinates of the
  ! center of a circle given three points on the circle
  REAL :: xx1, yy1, xx2, yy2, xx3, yy3, aa, bb, rr
  a = (xx1+xx2+xx3)/3
  b = (yy1+yy2+yy3)/3
  r = sqrt((xx1-aa)**2+(yy1-bb)**2)
  RETURN
END SUBROUTINE calculate_circle
```

Save the file under the name *C:\g95\MyPrograms\Circles\calculate_circle.f95*.

To compile the two Fortran files just typed, within the *g95* command window, type:

```
cd .. <return>
```

to move to the upper directory level (*C:\g95*)

Then type:

```
cd C:\g95\MyPrograms\Circles <enter>
```

to change the directory to the *Circles* folder.

To compile the files use the following commands:

```
g95 -c circle.f95 <enter>
g95 -c calculate_circle.f95 <enter>
```

Then, type

```
dir <enter>
```

to check that files *circle.o* and *calculate_circle.o* exist. These are the *object* files created by the compilation of the source files.

To create an executable file use:

```
g95 circle.f95 calculate_circle.f95 -o circle.exe <enter>
```

Press

```
dir <enter>
```

to check that the file *circle.exe* exists.

To run the program type:

```
circle <enter>
```

Enter the values:

1,2,3,4,5,6 <enter>

as input to the program. The result is the message:

The centre of the circle through these points is (3. , 4.)
Its radius is 2.828427

Command Window commands

The Command Window allows the user to manipulate files through the use of a number of commands. To get a list of the available commands use:

help <enter>

Some of the most useful commands are:

CD	Displays the name of or changes the current directory.
COPY	Copies one or more files to another location.
DEL	Deletes one or more files.
DIR	Displays a list of files and subdirectories in a directory.
EXIT	Quits the CMD.EXE program (command interpreter).
MKDIR	Creates a directory.
RD	Removes a directory.
REN	Renames a file or files.
REPLACE	Replaces files.
RMDIR	Removes a directory.
VER	Displays the Windows version.

Specific help on a particular command can be found by using

help *command_name* <enter>

e.g., try

help CD <enter>

Additional information on FORTRAN

For additional information on FORTRAN visit my web page:

<http://www.engineering.usu.edu/cee/faculty/gurro/Fortran.html>