

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*.

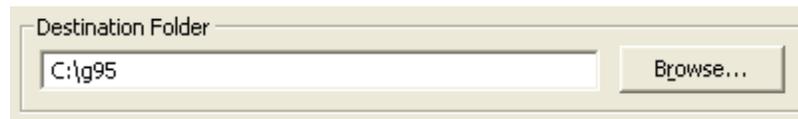
Installing g95

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.,

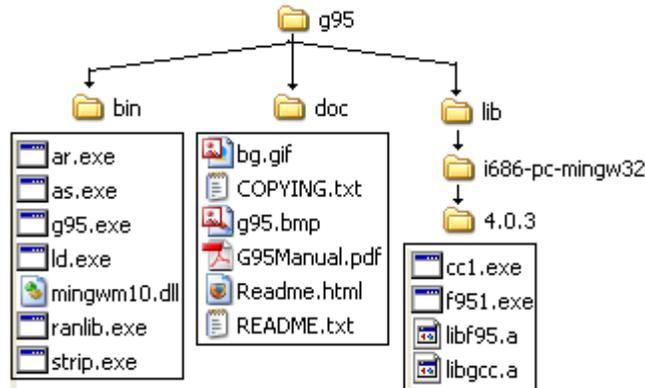


Press [Install]. During installation you'll be asked the following questions:

- 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 “successful 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.f85*

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 aList.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 aList.f95

Next, type:

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

Type

dir <enter>

again and make sure that the file *aList.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>