

# Department of Computer Science

## 2007/2008

### 08128 Programming Fundamentals

#### Practical 1

#### **Laboratory Work in the Department**

Welcome to our laboratory sessions. You will have a lab session each week during the taught part of the programming course. *It is best if you prepare for the laboratory in advance.* You can view the lab material by visiting the web site for this course. Details of the address of the web site are given at the end of this document.

Remember that these practical sessions will **not** teach you how to program. They will help you *learn* how to do it. You have to put effort into the process yourself, just like you had to work hard to learn to ride a bicycle! (note that you can still learn to program even if you cannot ride a bike)

In this session you are going to find out how to start using the computers, how to create a session and also how to create and run programs written using the Visual Basic programming language.

#### **The Laboratory Documents**

Each week you will be given a document which describes what you have to do. Some of the work will be assessed, either in the laboratory itself, or as a submitted piece of work. In these lab sheets the work you have to do is indicated as follows:



This indicates an activity you should perform in the laboratory, at this point in the text. You may be given precise instructions, or you may have to work something out for yourself.



This indicates an investigation that you will have to perform. You should write up what you discover as this material may form the basis of discussion in your tutorial group meetings.

#### **The University Network**

All of the workstations you are going to use are connected to the university campus network, which operates using Microsoft networking. The workstations themselves run the Microsoft Windows XP operating system.

There are a large number of workstations around the campus. Some are in the Computer Centre, others are in the library and we have systems in laboratories which are specifically set aside for Computer Science and Engineering students. Most of your practical sessions will take place in the Fenner Computer Suite.

It does not matter which particular workstation you sit down at. A number of user settings, called your *profile*, are held centrally and used to configure the workstation that you log in to. However, you may notice that some systems provide a different range of programs. This is because we have customised "our" workstations with software which is not generally available across the campus.

#### **Registration and Usernames**

Each user of the campus network is uniquely identified by a user number. A valid number allows you to make use of computer systems managed by the university. Your number also gives you

access to your own area on a central file store and a print quota for the laser printers. You will also need your number to send and receive email using your university email address. All of the items that you create on the campus network are marked as being "owned" by you and you are the only person allowed to use them.

## **Username and Passwords**

You have been allocated a user number and password as part of your registration. Your welcome pack contains details of your unique user identity, which is a six digit number. This number is unique to you and will stay with you throughout your university career. Your password is generated randomly. You will have to give your password each time you "log in" to start a session on the computer. A few things about passwords:

1. If you forget your password or user number you will be unable to use the computer systems. You will have to go to Computer Reception and ask for help. You will be required to present proof of identity.
2. The password you are initially given is printed on your registration form. In case anyone has seen this form you should change this password the very first time you use the computer systems. Try to choose a memorable password, but be careful that you do not choose one which is easy to guess. The system may reject passwords that it regards as insecure. I suggest that you run two words together, and perhaps include numbers as well as text. In the past I have used things like "s0mechance" (please do not use this). *Do not to pick a password that you have to write down!*
3. You will be held liable for any actions performed whilst logged in with your user number. It is **very** important that you keep your password private. Do *not* divulge it to anyone else.
4. If you suspect that someone is using your user number and password to gain access to the computer systems you should inform the Computer Centre as a matter of urgency.

You change your password using the **setpass** command. You will use this command later in this laboratory.

## **Computer Regulations**

The regulations governing computer use in the university are printed on the back of your registration form. If you fail to abide by these you may find your username disabled, which might make it impossible to complete mandatory coursework, and lead to you failing modules.

## **Sessions at a Workstation**

At the start of a session you introduce yourself to a vacant workstation by "logging on". When you log on you identify yourself with your user number and password. This combination is checked to ensure that you are who you say you are. If the user number and password are valid the Windows XP operating system then sets up a number of system preferences for you, connects to your file storage area and allows you to use the workstation.

At the end of a session you say goodbye by "logging off". At this point the link with your file storage is broken, and the workstation waits for the next person to log on.

*Logging off properly is at least as important as logging on.* If you do not log off you leave the workstation connected to your name, and anyone else can do what they like *in your name*; including deleting all your programs, reading and sending email etc.

## **Logging on to a workstation**

To log in to the system find a vacant machine. If the screen is completely blank you may have to move the mouse to stop the screensaver. Hold down the Ctrl and Alt keys and then press the Delete

key (sometimes marked Del and located next to the 0 key in the numeric keypad at the right of the keyboard). This will cause the following screen (or one a bit like it) to appear:



Enter your User name and Password and press OK to log in. If all goes well you will be logged in and able to use the system. If you have any problems there will be someone in the practical session that can help you out.

**Figure 1 Login Dialogue**

This is the login screen.

If the login process fails make sure that you have *not* used CAPITAL LETTERS where you should have used lower case. Windows XP treats A and a as different characters in both the username and the password. Also make sure that the Workstation only tick box is empty. If anything goes wrong, make a note of the error and then report it to a laboratory demonstrator.

### Logging out from a Workstation

When you have finished working on the workstation you *must* log out. To log out you use the mouse to press the Start button. This will cause the Start Menu to appear. Press the Shut Down button at the bottom of this menu. This will cause the Shut Down screen to appear. Select the option to log off.

*You should not turn off the power from the computer. The workstations are left running at all times.*

Once the logout has completed the system should display a prompt for the next user.



Before you go any further; perform the following:

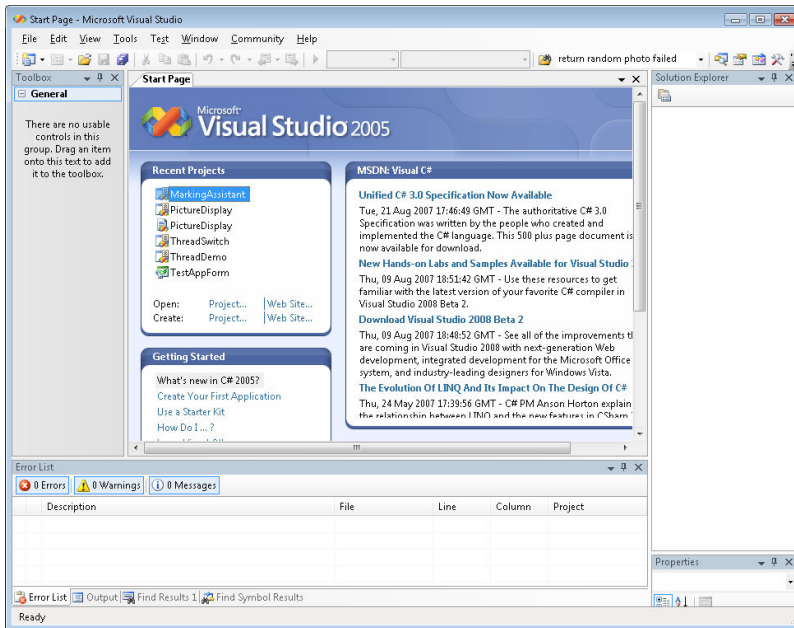
1. Log on to a workstation using your username and password.

### Making our First Program

We are going to use Visual Studio 2005 to create all our programs in Visual Basic.



2. Press the Start Button on the Windows desktop, open up Programs and then Visual Studio 2005.

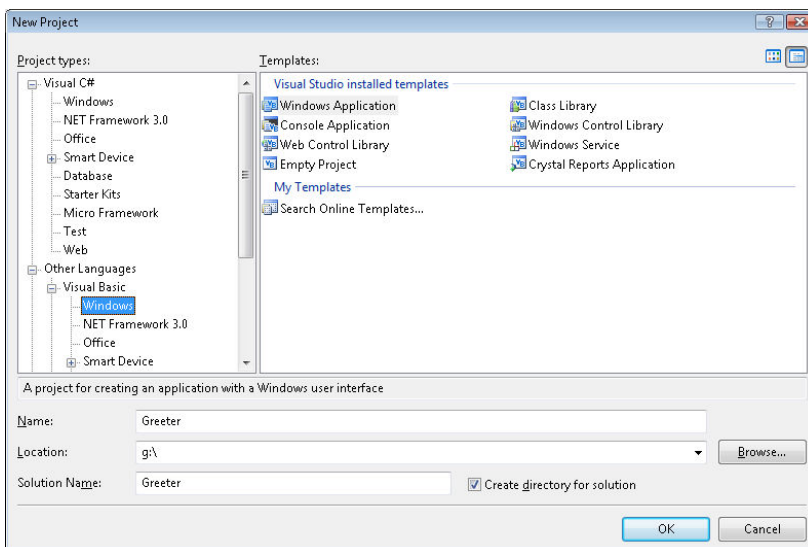


**Figure 1 Visual Studio 2005**

We are going to start by creating a new Visual Studio 2005 Visual Basic project and exploring how events work in our programs.



3. Click on the File menu item, and select New and then Project. This should cause the New Project dialogue to appear as shown below.

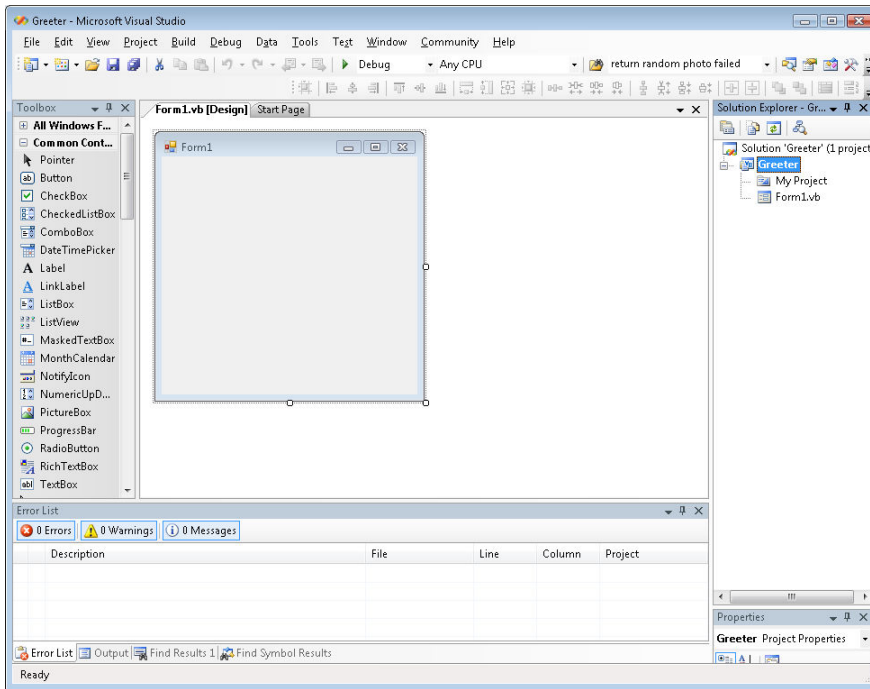


**Figure 2 Creating a new project**



4. Your first project will be called Greeter. You should place it on drive G:\ as shown in the location item above. Select a Visual Basic project Windows Application as shown and press OK. You should now start work on this project

:



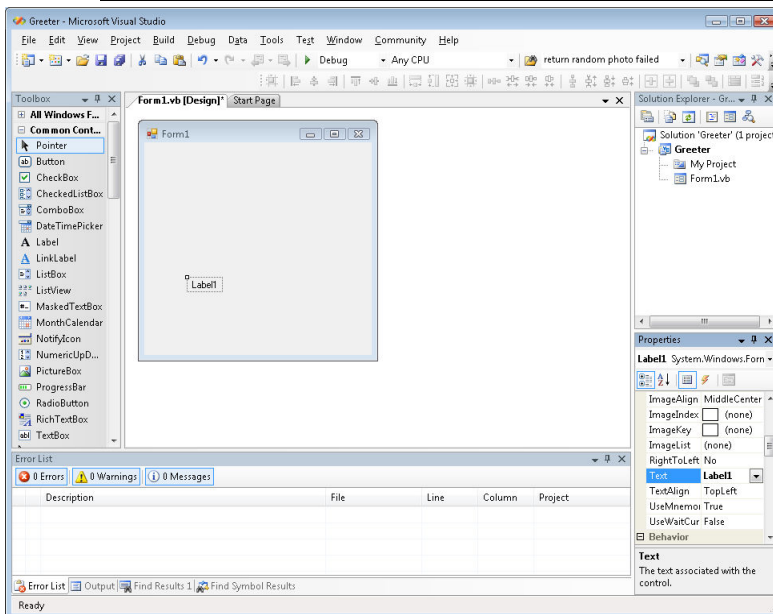
**Figure 3 Working on a project**

If your screen does not look exactly like this don't worry. If the Toolbox is missing, click on the View menu and select ToolBox from the list that appears.

Next we are going to add a label to the form. Labels are used to identify items on a form and can also be used to send messages to the program user.



5. Click on Label (7<sup>th</sup> item down in the toolbar in Figure 3) and drag it onto the form.

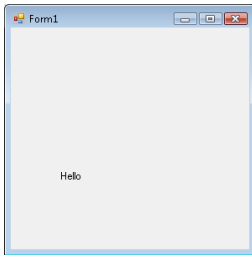


**Figure 4 Label and properties**

You now have a label in the form, at the moment it has the default text on it. Default means “what you get when you don't ask for anything special”. Now we are going to change the properties of the label so that it displays a different message.



- Click on Label1 and take a look at the properties page on the bottom left of the display. You may need to move things around in the Visual Studio display (you can do this by dragging the edges of the windows into position. Find the Text property and change it from Label1 to Hello. The property is highlighted in Figure 4 above.
- Now open the Debug menu and select Run. This will run your program.



**Figure 5 A running program**

You are now running your first program.



- Now open the Debug menu and select “Stop Debugging”. Your program will stop.

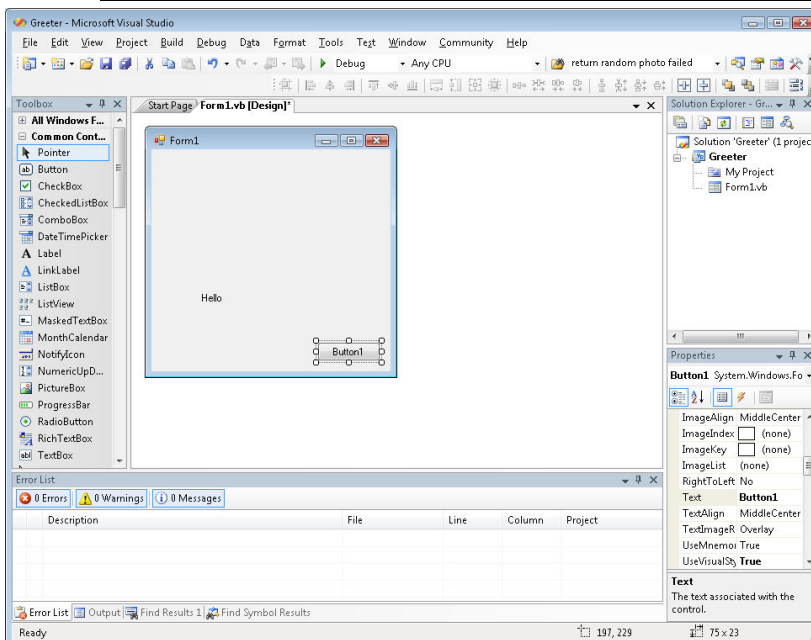
You have just run your first Visual Basic Program.

## Adding Events

Now we are going to add another component to the form. We are going to add a button for users to press. When the button is pressed we are going to make the text on the label change from “Hello to Goodbye”.



- Make sure your program is stopped. Now click the Button item in the Toolbox and drag it onto the form.



**Figure 6 A button**

At the moment the button has the text “Button 1”.



- Change the Text property of the button to “Press Me”.

Now we are going to connect some VB code to the event the button generates when it is pressed. This is actually very easy to do.



11. Double click on the button on the form.

When you do this Visual Studio connects a piece of empty Visual Basic code to the click event of the Button. It then opens up the program editor at this piece of code. Now we are going to put some Visual Basic statements into the subroutine that runs when the button is pressed. The statement will change the text in the label to “Goodbye”.



12. Add the line `Label1.Text = "Goodbye"` into the subroutine.

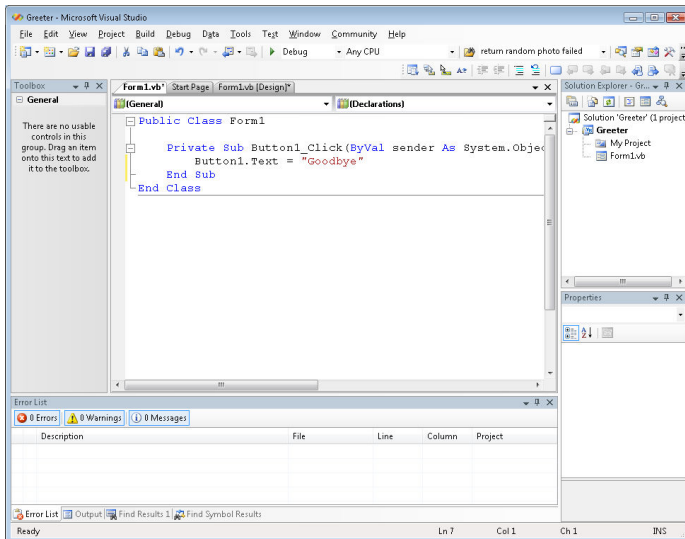


Figure 7 A button event handler which changes the state of the label.

Now run the program, when you press the button the text on the label should change to “Goodbye”.

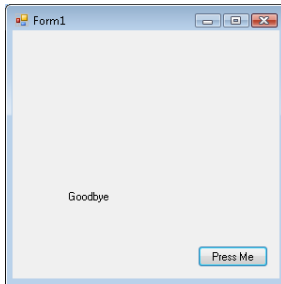


Figure 8 Running the program

When you have finished using Visual Studio 2005 you can close it down by selecting Exit from the File menu.

## Further Development



There is a mistake in one of the figures. See if you can find it. Send an email to Rob Miles identifying the faulty figure and why when you find it. Earliest email wins a Mars bar.



Visual Basic Buttons have a property that controls whether they are Visible or not. This property can be either True or False. Change the program so that when you click on the button it disappears.

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