Programming with C#.NET

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FRONT COVER IMAGES

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Introduction

The purpose of this book is to provide a simple introduction to C#.NET programming with Microsoft Visual Studio 2010. This was designed initially for students of the Glyndŵr University Foundation Degree in Applied Computing who are undertaking the module 'Object Oriented Programming' in the second year of their course. These students will have completed a module in text-based Java programming in which a variety of console applications were developed. They should be familiar with basic programming structures such as loops, conditionals and arrays, and will have been introduced to object oriented concepts of classes, properties and methods.

Visual Studio provides a very wide range of programming and database tools for software development. It is therefore possible to solve the same software problem in a number of different ways, and each individual programmer is likely to develop their own preferred techniques and methods of working. The solutions demonstrated in this book are not necessarily claimed to be the 'correct' or 'best' programming approaches, but have been found to work reliably and to be relatively easy to understand.

For reasons of space, comment lines have not been included in the program listings, although programming techniques are explained in the accompanying text. Students are strongly encouraged to add their own comment lines to the program listings, both as a way of checking their understanding of the program and as a way of easily identifying sections of code which can be copied into other projects as standard modules.

By working through the example programs in this book, students should gain an understanding of basic interface construction, processing and database operations in an object oriented C#.NET environment. Students are encouraged to develop the programs further by adding extra functionality, or to create their own similar projects which incorporate the programming techniques demonstrated here. Programming is a very practical activity, requiring extensive practice to develop a high level of skill.

Grateful thanks are due to students of Coleg Meirion-Dwyfor who have helped in the design and testing of the example programs in this book. However, the author accepts sole responsibility for any errors in the work.

Chapter outline

The initial chapters **Camera** and **Calculator** demonstrate the construction of graphical user interfaces in Microsoft Visual Studio from toolbox components. Conversion between string and numeric data formats is explained, and the TRY…CATCH error handling structure is introduced.

The program **Railway Tickets** represents a more substantial application, with data values passed between the forms. Boolean variables are used in conjunction with radio button groups.

The **Solitaire** game demonstrates the creation of a two dimensional array of buttons at run time, to produce an interactive game board display. Algorithm logic is developed to check for valid moves during the game.

Airport introduces the techniques for setting up a database table, accessing the database from a C# program at run time, and displaying the table data in grid view on a form.

The **London Underground** route finding program explores the techniques for drawing graphics in C# at run time, and provides further practice in handing database tables and arrays. A more complex algorithm is developed, involving multiple nested loops.

The **Estate Agent Database** program demonstrates a full range of file handling operations for a multiple table database: creating, displaying, editing and deleting records, and selecting particular records by means of SQL queries.

College Courses introduces an object oriented approach to representing entities in a data model. The program defines object classes for students, courses and registrations within an administrative system.

Fast Food is a small program demonstrating how picture images can be stored directly into a database table in binary format, then reloaded for display on screen.

The final program project, **Theatre Bookings**, brings together many of the techniques developed in earlier chapters. Again there is an emphasis on object oriented design, with classes representing theatre events, customers and bookings. Bookings are made via interactive seating plans of the theatre, and extensive use is made of database operations to handle booking records.