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INTRODUCTION TO PROGRAMMING

2021

5 jours

+ 20 ANNÉES d'expériences à votre service

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FORMATION

R Programming

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Adresse : 47 Av. Mouaouia IBN ABI SOFIANE, El MENZAH VI, 2091 ARIANA, TUNISIE

Durée:

5 jours

Langue

Anglais

Formations dirigées par un instructeur

Objectif

In this 5-day course, students will learn the basics of computer programming through the use of Microsoft Visual Studio 2013 and either the Visual C# or Visual Basic programming languages. The course assumes no prior programming experience and introduces the concepts needed to progress to the intermediate courses on programming, such as 20483B: Programming in C#.

Profil population cible

This course is intended for anyone who is new to software development and wants, or needs, to gain an understanding of programming fundamentals and object-oriented programming concepts. They will typically be high school students, post-secondary school students, or career changers, with no prior programming experience. They might want to gain an understanding of the core programming fundamentals before moving on to more advanced courses such as 20483B: Programming in C#.

Examen de certification

N/A

Prérequis :

Before attending this course, students must have:
Ability to use computers to start programs, open and save files, navigate application menus and interfaces.
Ability to create, understand, and follow structured directions or step-by-step procedures.
Ability to understand and apply abstract concepts to concrete examples.

Plan du cours

Explain core programming fundamentals such as computer storage and processing.
Implement object-oriented programming concepts.
Identify the performance considerations for applications.

Module 1

Introduction to Core Programming Concepts

This module provides background and foundational information on how computers process information, discusses the different types of applications that a programmer might be creating, and then provides information on how code is compiled and interpreted by a computer.

Leçons

- Computer Data Storage and Processing
- Application Types
- Application Life-Cycle
- Code Compilation
- Lab : Thinking Like a Computer
- After completing this module, students will be able to:
- Describe computer data storage and processing concepts
- Describe application types
- Describe the lifecycle of an application
- Describe code compilation

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Module 2

Core Programming Language Concepts

This module covers programming language syntax and the importance of using good syntax and following the syntax rules for the chosen language. This module also discusses the core data types and how to store these data types in computer memory by using variables and constants.

Leçons

- Syntax
- Data Types
- Variables and Constants
- Lab : Working with Data Types
- After completing this module, students will be able to:
- Define syntax
- Explain the different types of core data used in programs
- Declare and use variables and constants in a computer program

Module 3

Program Flow

This module covers how code is executed in a computer program, such as top to bottom, in structured programming and branching in code execution. The module teaches these concepts through the use of functions, decision structures, and looping constructs.

Leçons

- Introduction to Structured Programming Concepts
- Introduction to Branching
- Using Functions
- Create and use functions in your code
- Create and use decision structures
- Create and use looping structures

Module 4

Algorithms and Data Structures

This module introduces the concept of an algorithm by examining a daily routine such as a morning routine for getting up and going to work, outlining all the steps required including the decisions to be made as the routine progresses.

Leçons

Understand How to Write Pseudo Code
Algorithm Examples
Create algorithms
Translate pseudo code into programming code
Create simple algorithms in code
Create data structures to store data

Module 5

Error Handling and Debugging

This module helps students understand that errors are a part of programming and they must understand how to anticipate errors, handle those errors in code, and present a good user experience with a program. This module introduces structured exception handling as the mechanism to deal with errors.

Leçons

Introduction to Program Errors
Introduction to Structured Error Handling
Introduction to Debugging in Visual Studio
Implement structured exception handling
Debug applications by using Visual Studio 2013

Module 6

Introduction to Object-Oriented Programming

This module covers an introduction to the concepts related to object-oriented programming (OOP). The content has been split across two modules with this module focusing on basic OOP concepts that will provide sufficient knowledge to understand complex data structures starting with structs and then moving onto classes.

Leçons

- Introduction to Complex Structures
- Introduction to Structs
- Create and use structure types
- Create and use basic class files
- Choose when to use a struct vs a class

Module 7

More Object-Oriented Programming

This module teaches students about inheritance and polymorphism in classes and function overloading. Function overloading and polymorphism can go hand-in-hand as often times when you inherit from a class, you want to override or change the existing behavior to suit the needs of you class.

Leçons

- Introduction to Inheritance
- Introduction to Polymorphism
- Implement polymorphism in your classes
- Describe how the base class library is constructed
- Find class information by using the Object Browser

Module 8

Introduction to Application Security

This module helps students think about security in their applications. This module introduces the concepts of authentication for users and also introduces the concept of permissions for the code that is running on a computer. It explains that operating systems might prevent certain aspects of the program from executing, such as saving a file to a directory to which the user running the app might not have permission to write.

Leçons

- Authentication and Authorization
- Code Permissions on Computers
- Describe how to apply access permissions for executing code on a computer
- Explain how code signing works

Module 9

Core I/O Programming

This module introduces some core input/output (I/O) concepts that programmers will use while creating applications. Starting with console I/O, this module introduces input and output to the Console window.

Leçons

- Using Console I/O
- Using File I/O
- Lab : Core I/O Programming
- Read input from a console
- Output data to the console
- Read and write text files

Module 10

Application Performance and Memory Management

This module enables students understand that memory on a computer is a finite resource. It talks about how good application design and good coding discipline with memory conservation and memory management will help programmers learn to develop applications that users will like. This is because these applications will be fast, responsive, and do not negatively impact other applications.

Leçons

- Value Types vs Reference Types
- Converting Types
- The Garbage Collector
- Lab : Using Value Types and Reference Types
- Implement value and reference types correctly in an application
- Convert between value types and reference types
- Use the garbage collector

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