Computer Fundamentals

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Lecture 20

Outline

- Programming languages
- Markup languages
- Software development process

Programming Language

- Used to generate source code
- Programmer can avoid using machine code
- Have strict rules of syntax
  - Symbols and punctuation have meaning
  - Spelling must be exact
- Code is converted into machine language

Language Categories

- First generation languages
  - Machine languages
  - Written in binary
  - Different for every CPU
- Second generation languages
  - Assembly languages
  - Statements that represent machine code
  - Code converted by an assembler
  - Still used to optimize video games

```
;CLEAR SCREEN USING BIOS
CLR: MOV AX,0600H        ;SCROLL SCREEN
     MOV BH,30           ;COLOUR
     MOV CX,0000         ;FROM
     MOV DX,184FH        ;TO 24,79
     INT 10H             ;CALL BIOS;
;INPUTTING OF A STRING
KEY: MOV AH,0AH          ;INPUT REQUEST
     LEA DX,BUFFER       ;POINT TO BUFFER WHERE STRING STORED
     INT 21H             ;CALL DOS
     RET                 ;RETURN FROM SUBROUTINE TO MAIN PROGRAM;
; DISPLAY STRING TO SCREEN
SCR: MOV AH,09           ;DISPLAY REQUEST
     LEA DX,STRING       ;POINT TO STRING
     INT 21H             ;CALL DOS
     RET                 ;RETURN FROM THIS SUBROUTINE;
```

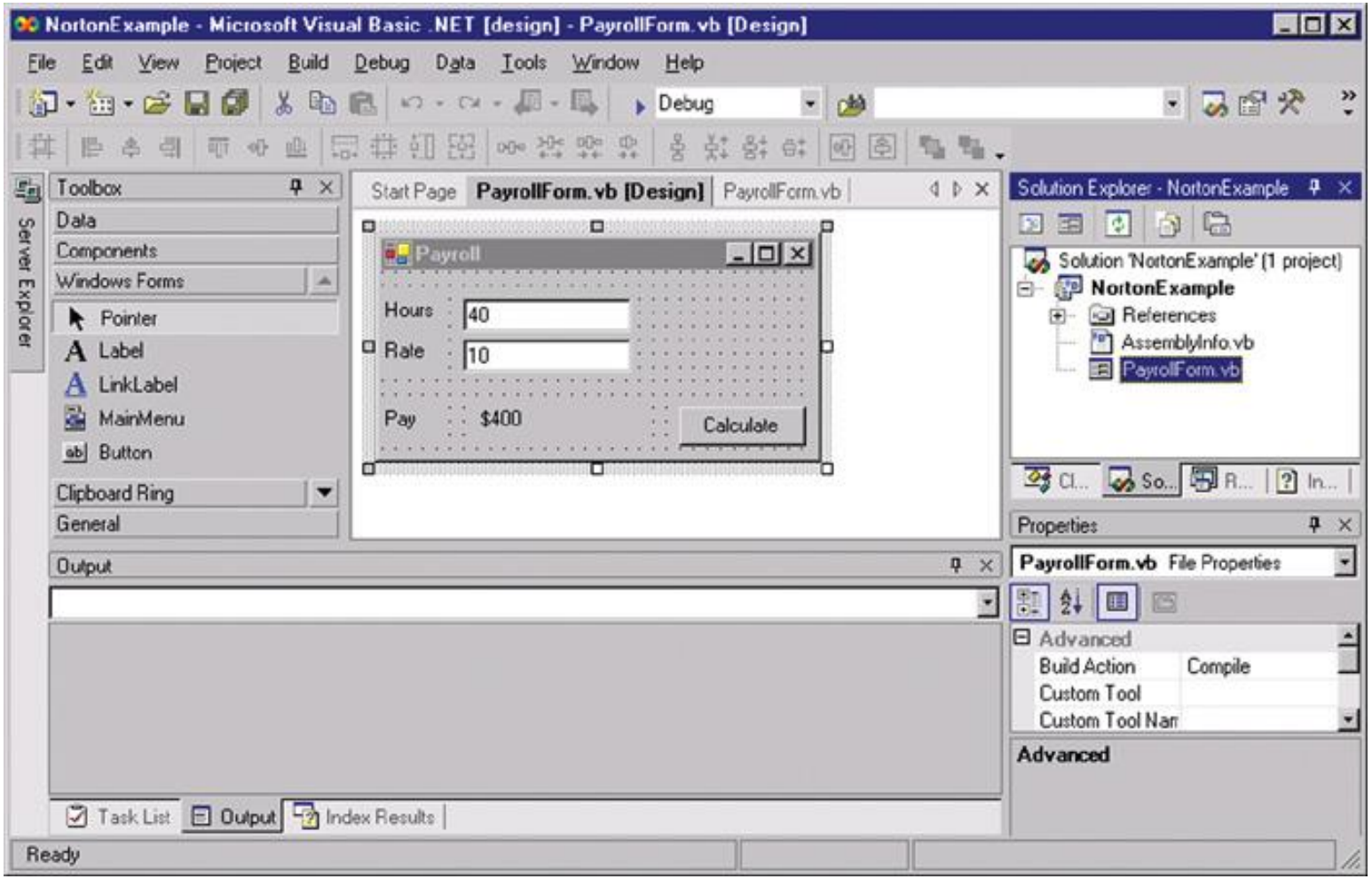
Language Categories (cont.)

- Third generation languages (3GL)
  - High level languages
  - Support structured programming and OOP
    - Code is reusable
    - Code is portable
  - Typically written in an IDE
  - C/C++ creates games and applications
  - Java creates web applets
  - ActiveX creates Web and Windows applets

Language Categories (cont.)

- Fourth generation languages (4GL)
  - Easier to use than 3GL
  - Coded in a visual IDE
  - Tools reduce the amount of code
  - Object oriented programming supported
  - Microsoft .Net is 4G language
  - Dream Weaver is 4GL IDE

Language Categories (cont.)



Language Categories (cont.)

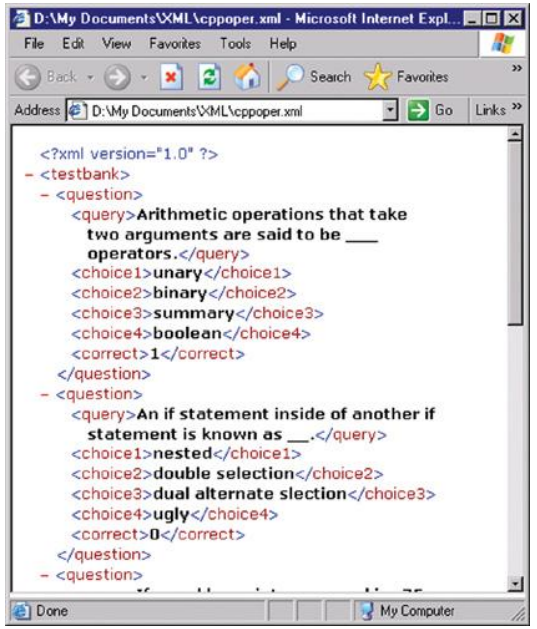
- Fifth generation language (5GL)
  - Mystery language
  - May not be created yet
  - Will create software automatically

www Development Language

- Markup languages
  - Describe how text is formatted
- Hyper Text Markup Language (HTML)
  - Basis of all web pages
  - Defines web structure using tags
  - Easy to learn and use
  - Created with a text editor

www Development Language (cont.)

- Extensible Markup Language (XML)
  - Source document presentable in several formats
  - Looks like HTML
  - Allows developers to create own tags
  - XML needs HTML for formatting, displaying data
    - Not a replacement of HTML
- Extensible HTML (XHTML)
  - Newer version of HTML
    - Based on XML rules
  - Stricter rules, loose coding not allowed like HTML
    - Tags must be properly closed etc.
- Extensible Style Sheet Language (XSL)
  - Formats, displays XML documents for HTML browsers (explorer etc.)
  - XSL rules dictate formatting
  - Simplifies -> creation of standard XML page with several formats



www Development Language (cont.)

- Extensible HTML Mobile Profile
  - XHTML MP
  - Initially Wireless Markup Language (WML)
  - Creates pages viewable on a handheld
- Cascading Style Sheets (CSS)
  - Format for HTML, XHTML etc.
  - Applies consistent formatting to all pages
  - Adapts document for various screen sizes
  - HTML deals with content and CSS with style

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
    background-color: lightblue
}

h1 {
    color: white;
    text-align: center;
}

p {
    font-family: verdana;
    font-size: 20px;
}
</style>
</head>
<body>

<h1>My First CSS Example</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

Source: *http://www.w3schools.com/css*

www Development Language (cont.)

- Web authoring environments
  - Reduces tedium (difficulty) for creating pages
  - Tools that simplify web site creation
  - Macromedia Dreamweaver
    - Simplifies large sites
    - CSS support is exceptional
  - Microsoft FrontPage simplifies large sites
    - Obsolete
  - Macromedia Flash creates web animations

www Development Language (cont.)

- Scripting languages
  - Create dynamic web pages
    - Change based on user input
  - HTML can create static pages
  - Page is generated as needed
- JavaScript
  - Developed by Netscape
  - Works inside of HTML
  - Page verification and simple animation
  - Based on Java
- Active Server Pages (ASP)
  - Developed by Microsoft
  - Based on Visual Basic
  - Good at connecting to Microsoft databases
  - Runs only on Microsoft servers

www Development Language (cont.)

- Perl
  - Practical Extraction and Reporting Language
  - Old language used on UNIX systems
  - Found on all Windows and Linux servers
  - Excellent web scripting language
- Hypertext Pre-Processor (PHP)
  - Especially good at connecting to MySQL database
  - Very popular language
  - Runs on UNIX and Windows

Systems Development Life Cycle

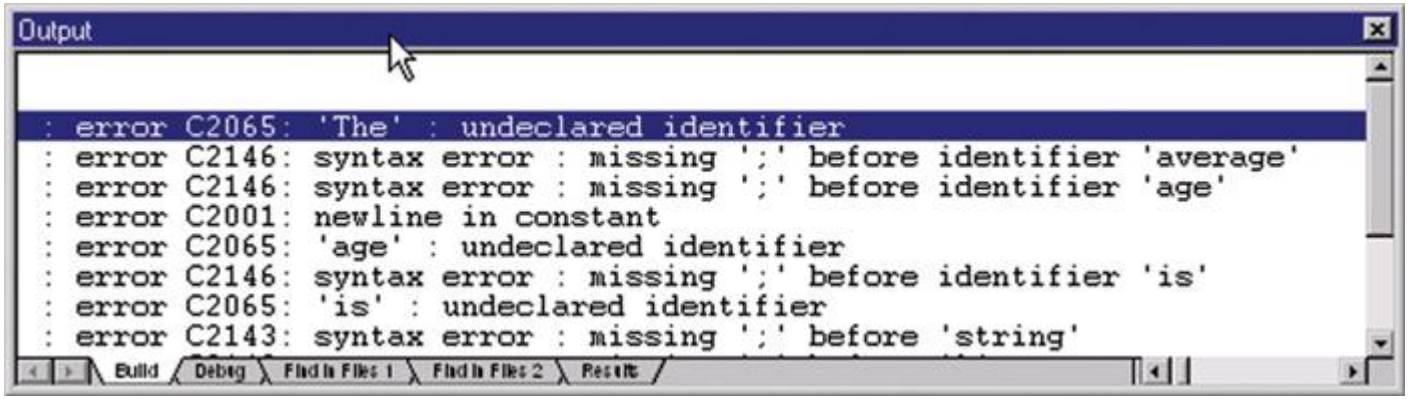
- SDLC
  - Organized way to build programs
- Consists of five phases

Systems Development Life Cycle (cont.)

- Phase 1: Needs Analysis
  - Users identify a need
  - Need is clearly defined before designing code
- Phase 2: Systems design
  - Solution to the need is defined
  - Many tools are used
    - IPO chart
    - Pseudocode
    - Flowchart
  - Prototypes of the solution are built

Systems Development Life Cycle (cont.)

- Phase 3: Development
  - Solution to the problem is built
  - Programmers write the solution
  - Technical writers document the process
  - Solution is continually tested



Systems Development Life Cycle (cont.)

- Phase 4: Implementation
  - The solution is installed
  - Users are converted to the new system
  - Trainers are important in this phase
- Phase 5: Maintenance
  - IT professionals monitor the product
  - Bugs are found and fixed
  - New features are added