



Computer Fundamentals

Dr. Safdar Nawaz Khan Marwat
DCSE, UET Peshawar

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

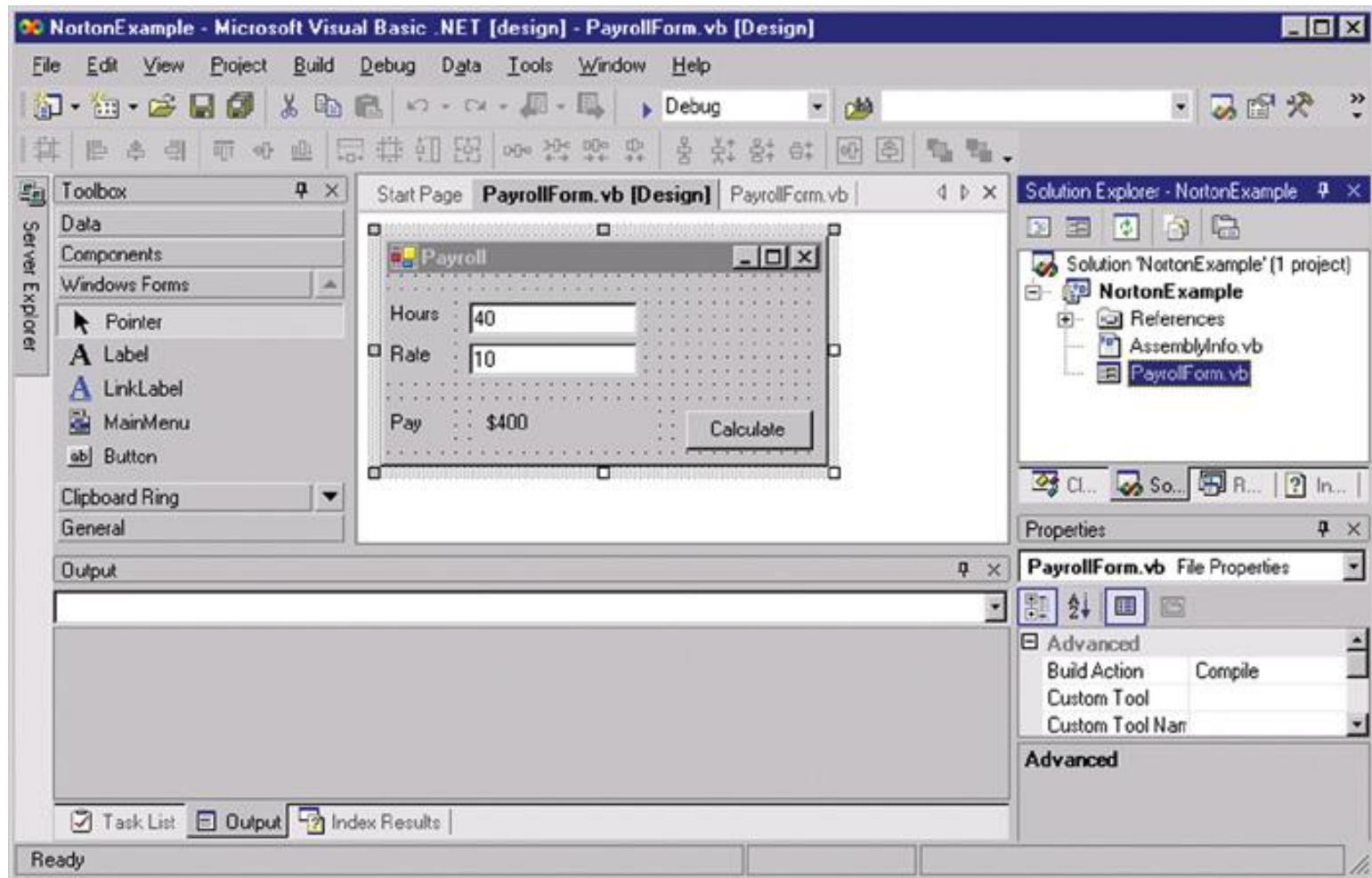


Language Categories (cont.)

- 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)

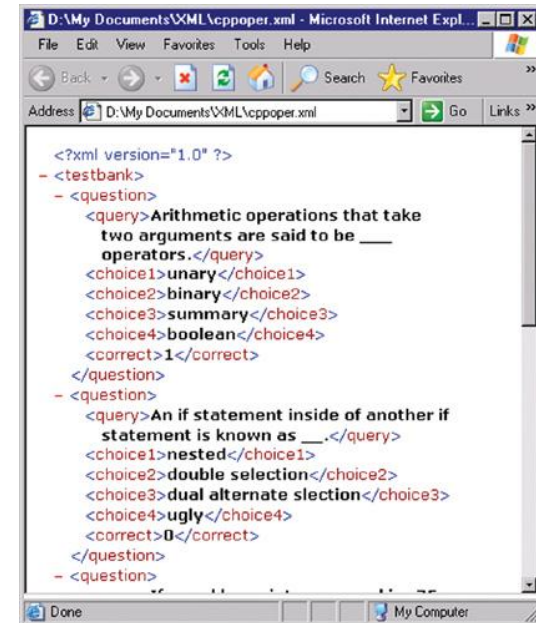
- ❑ Source document presentable in several formats
 - Web page, printable document, PDF file etc.
- ❑ Looks like HTML
- ❑ Allows developers to create own tags
- ❑ XML needs HTML for formatting, displaying data
 - Not a replacement of HTML

➤ 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
- ❑ XSL rules applied, once XML document is opened in browser





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

```
Output
: error C2065: 'The' : undeclared identifier
: error C2146: syntax error : missing ';' before identifier 'average'
: error C2146: syntax error : missing ';' before identifier 'age'
: error C2001: newline in constant
: error C2065: 'age' : undeclared identifier
: error C2146: syntax error : missing ';' before identifier 'is'
: error C2065: 'is' : undeclared identifier
: error C2143: syntax error : missing ';' before 'string'
```



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