Programming Basics Review

INFO/CSE 100, Spring 2005
Fluency in Information Technology

http://www.cs.washington.edu/100

Basic Concepts

• Names, Values, Variables
• Variable Declarations
• Assignment
• Data types
• Expressions
• Functions
• GUIs
• If/else statements
• For loop

Variable Declarations

• Variable Declarations
  » var <Variable Name>
  » Global variables are declared in the script tag outside of function
  » Local variables are declared in the function body.

Assign a value to a variable

• Assignment
  » Assignment statement changes a variable’s value
  » <variable> <assignment symbol <expression>>;

Readings and References

Reading
• Fluency with Information Technology
  » Chapter 18-21
• Appendix B, JavaScript Rules

Other References
• W3Schools JavaScript tutorial
  http://www.w3schools.com/js/default.asp
• W3Schools JavaScript HTML DOM Objects
  http://www.w3schools.com/js/js_obj_htmldom.asp
• Mozilla Browser
  http://www.mozilla.org/
• Games and Puzzles
  » Thomas Jefferson National Accelerator Facility, Office of Science Education
  » http://education.jlab.org/indexpages/elementgames.html

Names, Values, Variables

• Names, Values, Variables
  » Variables have names and values
  » Names (also called identifiers) are case sensitive
  » Values can change but names don’t!
  » Variables must be declared before they can be used
Data Types

- Numbers
  - No space, no grouping symbols, no units
  - 10000
- Strings
  - Must be in quotes (single or double)
  - Minimum number of characters in a string is zero ("")
  - All English letters and numbers are valid but there are some special characters that need an escape sequence
- Boolean
  - Two Boolean values: true, false

Expressions & Operators

- Expressions
  - The right-hand side of an assignment statement
  - Built out of variables and operators
- Operators
  - Numeric operators (+, *, ^, /)
  - String operator (+)
  - Relational operators (<, <=, ==, !, =>, =>>)
  - Boolean operators (&&, ||, !)

```javascript
totalPrice = salePrice + salePrice*tax;
fullName = "Ammy" + " " + "Phuwanartmurak";
fullName = firstName + " " + lastName;
```

Functions

- Template
  ```javascript
  Function <function name> (<parameter list>) {
    <statement>
  }
  ```
- Functions do not have to have parameters but we still need the parentheses
- Function definitions in <head></head>, and Function calls in <body></body>,
- Function body is in [ ]

Graphical User Interfaces (GUIs)

- We can use JavaScript to create GUI.
- GUIs provide an intuitive way to control a program.
- Layout of the GUIs
  - Forms <form></form>
  - Input controls
    - Button
      - input type=button value="label" onClick="JS text">
    - Text Box
      - input type=text name="identifier" onChange="JS text">
    - Radio
      - input type=radio name="identifier" onClick="JS text">label text

The if / else statement

The if statement is a conditional statement
- a conditional expression is evaluated as being true or false

```
if (<boolean expression>) {
  <then-statements>
} else {
  <else-statements>
}
```

The for loop

- Iteration or looping is a way to execute a block of program statements more than once.

```
for (var i=<number>; i<operator>;<incremental>){
  <statement>
  <statement>
}
```

```
for (var i=0; i<99; i++){
  document.writeln("Number: " + i);
}
```
The for loop

for (i=0; i < n; i++)
• Starts at i = 0
• check the limit before performing the statement(s)
• at the end of every pass through the for loop body, do the following:
  » get the value of i
  » increment i
  » store the incremented value
• i++ is the same as writing i = i + 1
• For others, i = i + <number>

Tips

• Order of events does matter in JavaScript
• Translating from English language to JavaScript language
• Debugging: Logical errors vs. Syntax errors
• Be patient: Programming is an iterative process...
• Practice! Practice! Practice!

Let’s program together!

• Example1: .length & .charAt()
• Example2: Basics + If/else
• Example3: For loop

Tryit Editor

Example1: .length & .charAt()

• .length returns the number of characters in a string.
• .charAt(index) returns the character at a specified position.
• Index starts at 0.

Example2: Basics + If/else

• Making a payment using your husky card.
• Alert when there is not enough money on the card.
• Display a summary after a payment is submitted.

Example3: For loop

• The user inputs “city” and “state”, and specifies number of times to display the information.
• If the display times is more than 5, the program will display both “city” and “state.” Otherwise it will display only “state”