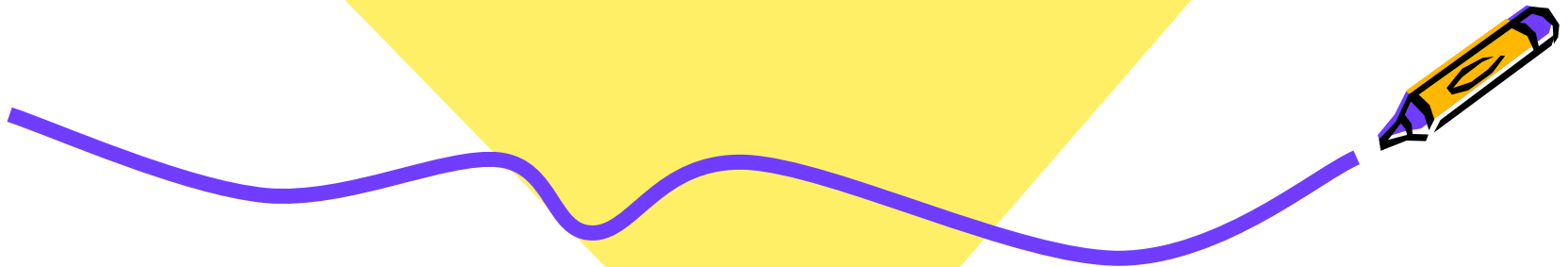


# Chapter 8 Objects and Variables

Xin Miao



# Object-oriented paradigm



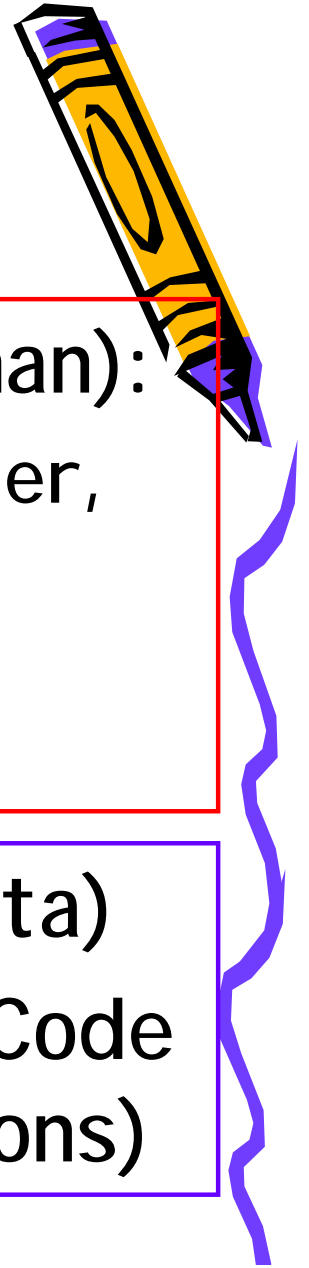
- Object-oriented programming (OOP)
  - Windows-based programming
    - Web browser: IE, Netscape, Firefox...
- Is JavaScript a OOP language?
  - Object-based



# What is Object?

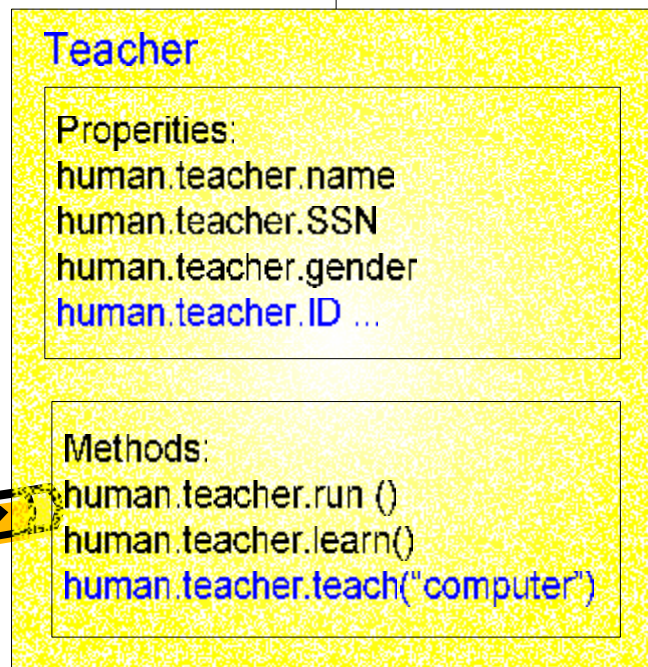
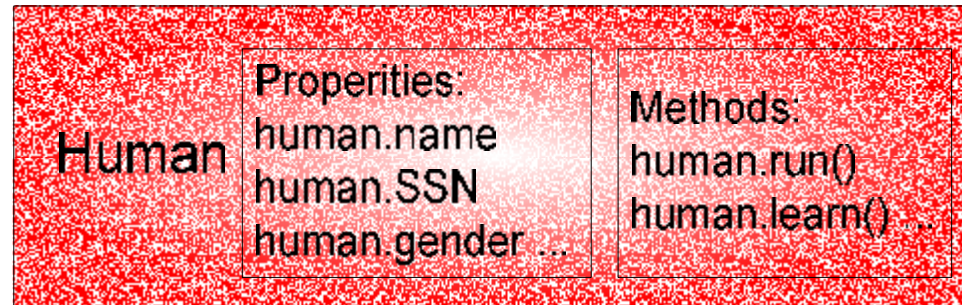
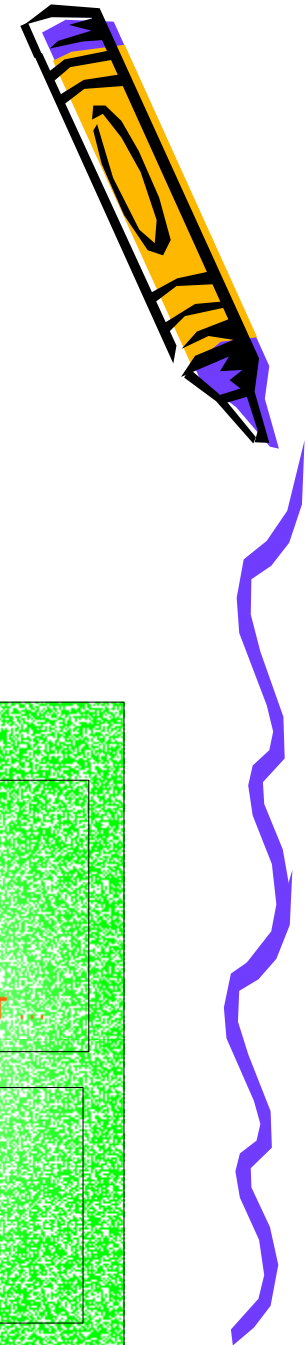
- **Biologic Object** (for example, human):
  - State: name, hair color, height, gender, nationality ...
  - Ability or functions: teach, play basketball ...

- Properties – define the State (Data)
- Methods – define the Behaviors (Code modules or sequences of instructions)

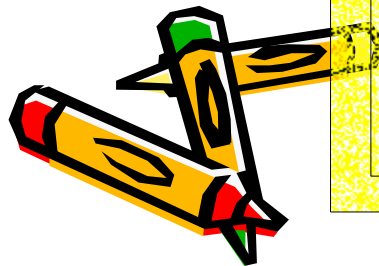
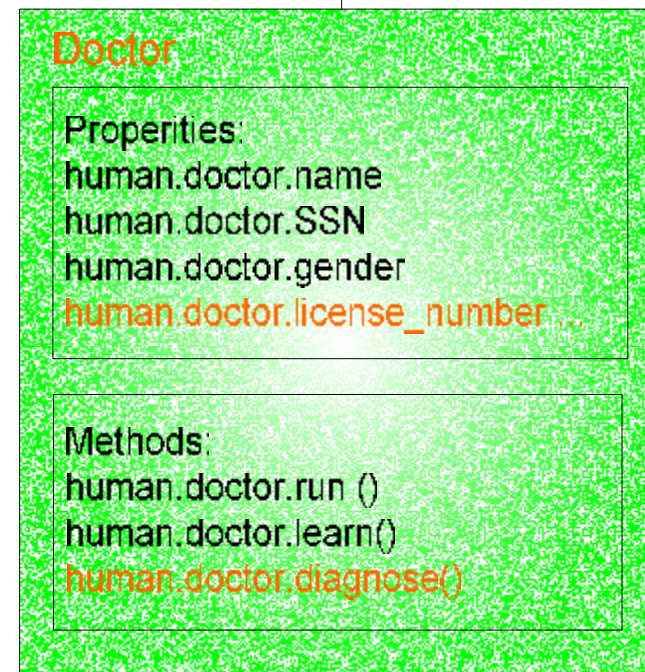


(Integration of the Gene Ontology into an object-oriented architecture, D. Shegogue *et al.*, BMC Bioinformatics 2005, 6:113)

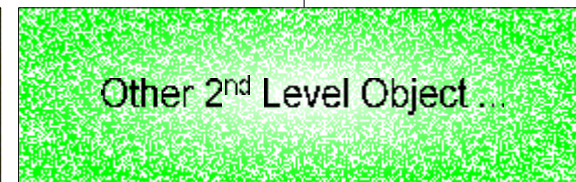
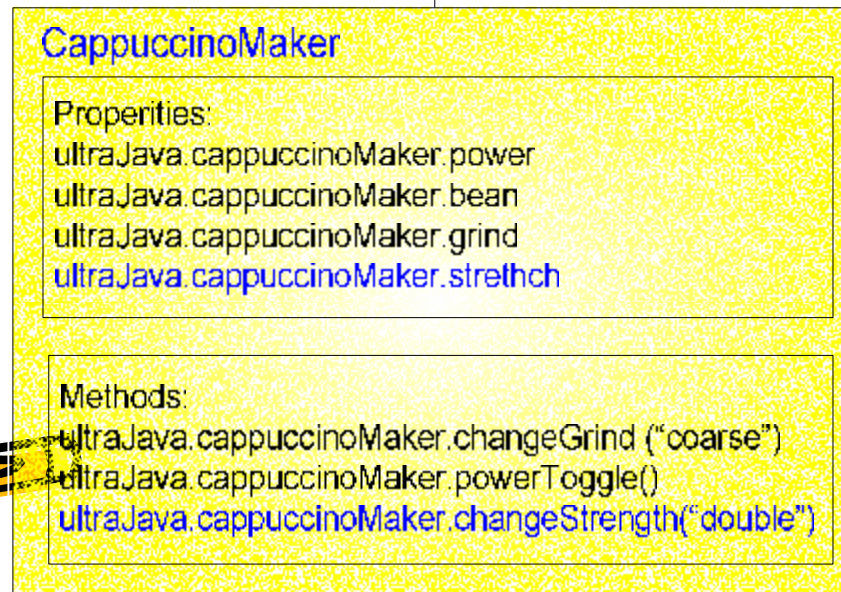
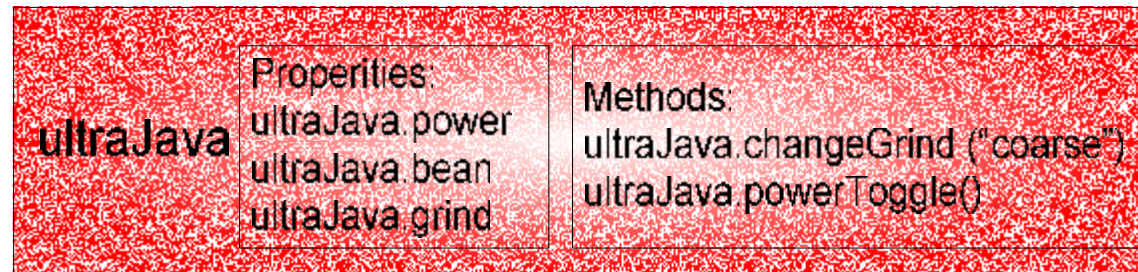
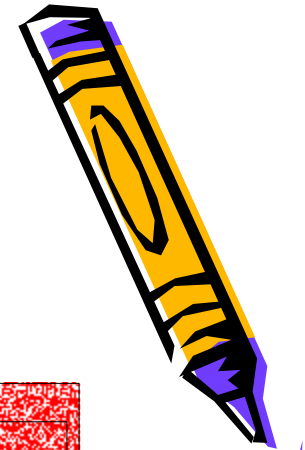
# A Hierarchy of Objects



...



# An Example of OPP

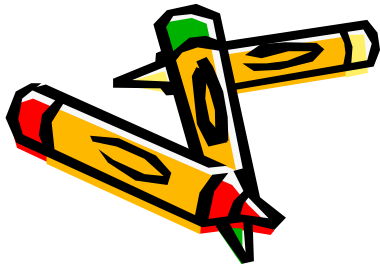
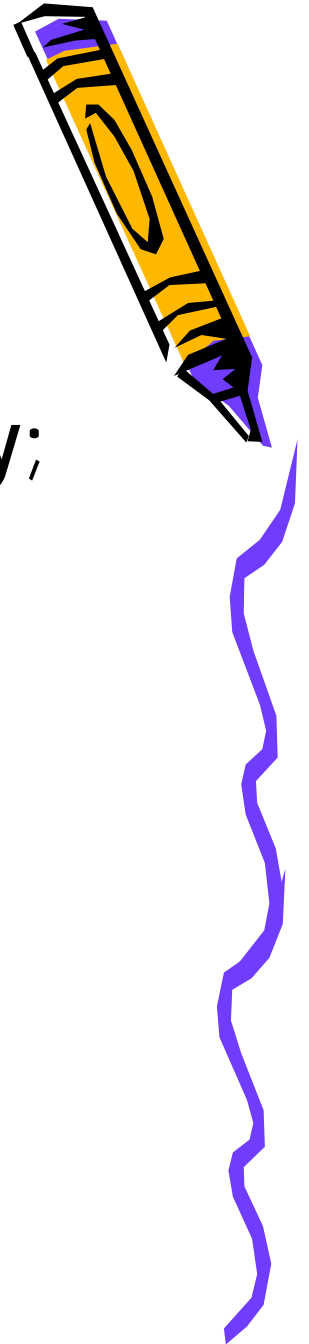


# Philosophy of OOP

- Based on a fit to human psychology;
- Object vs. human
- OOP vs. human society

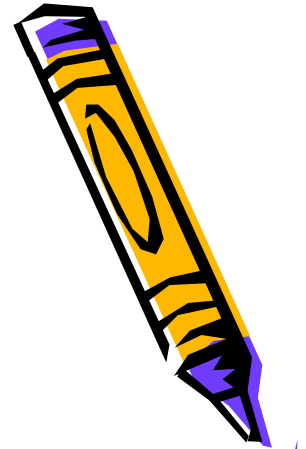
## Disadvantages

- "Would aliens prefer OOP?"



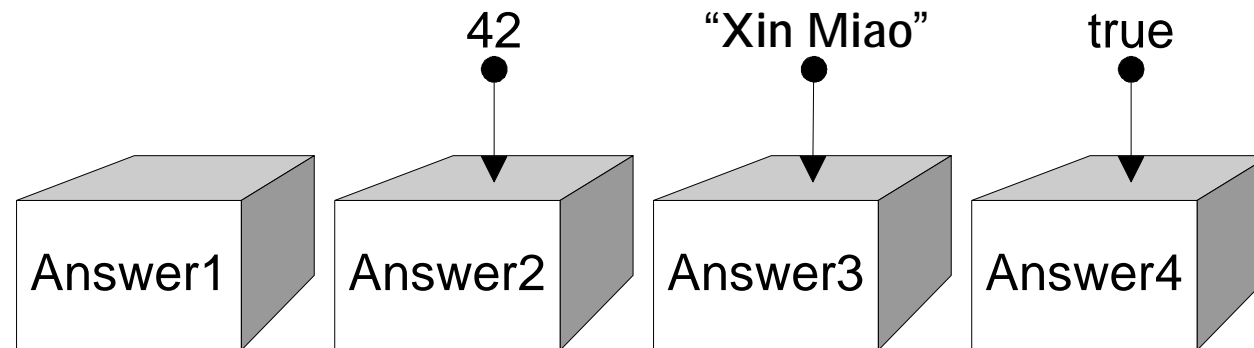
# Variables

- Data types
  - **String:** “name”, “grade”, “Computer” ...
  - **Number:** 23, 0.21, 1200 ...
  - **Boolean:** true or false
- Is there any other types?
- Assign var answer to be “true”, what’s its type? How about “42”?

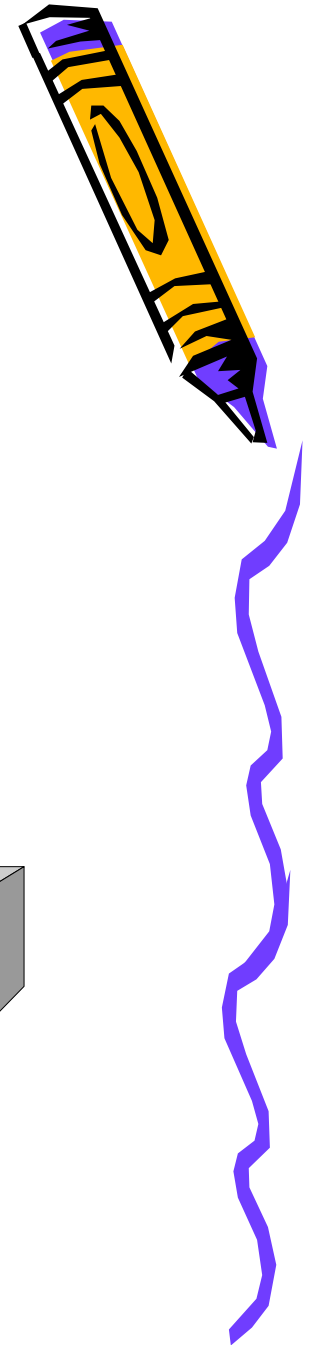


# Three characteristics

- The **type** of a variable
- The **name** of a variable
- The **value** of a variable



Q1: Variable name: **answer** and **Answer** are the same variable?

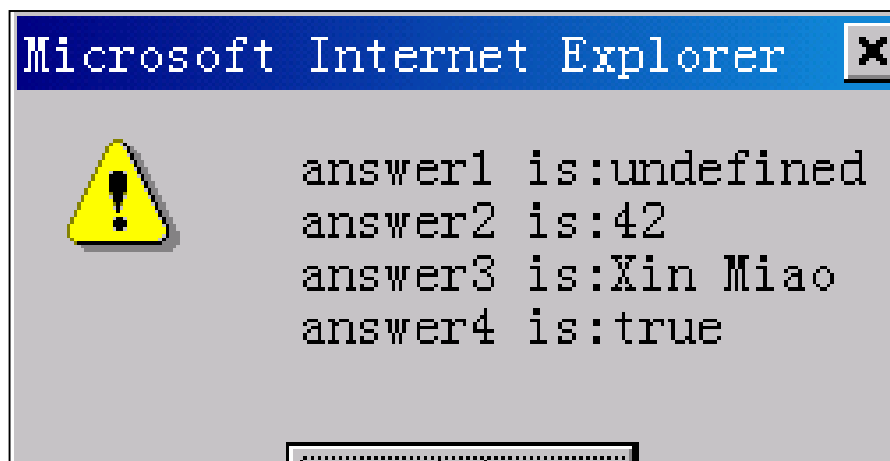




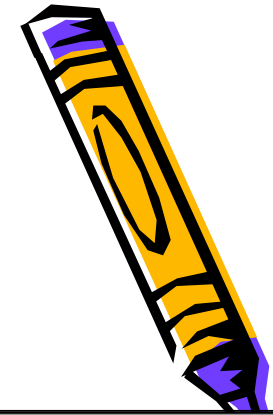
# Declaring a variable



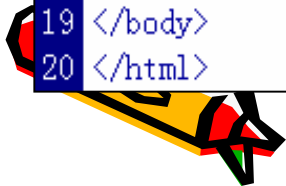
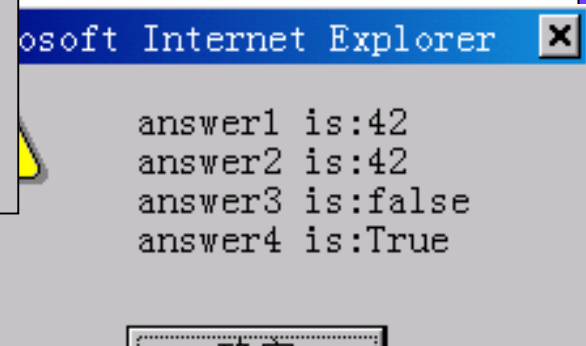
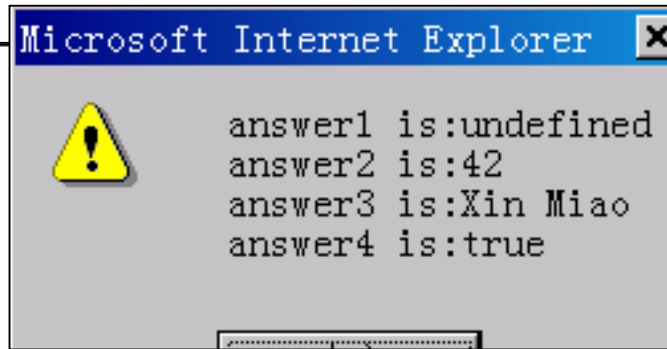
```
<script type="text/javascript">  
  var answer1  
  var answer2 = 42  
  var answer3 = "Xin Miao"  
  var answer4 = true //boolean  
  alert(" answer1 is:"+answer1+"\r answer2 is:"+answer2+"\r answer3 is:"+answer3+"\r answer4 is:"+answer4)  
</script>
```



# Code Analysis: what is the result?

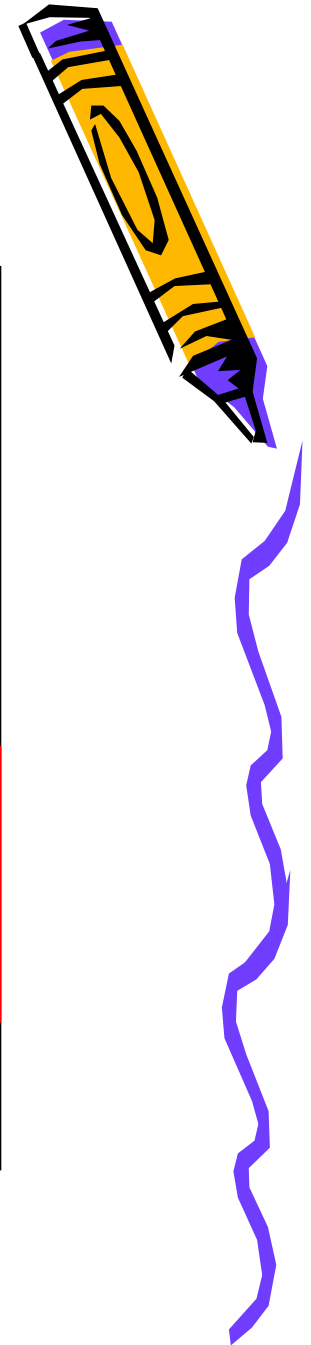


```
1 <html>
2 <head>
3   <title>Variable Demo</title>
4 </head>
5 <body>
6 <p> This is a Variable Demo. </p>
7 <script type="text/javascript">
8   var answer1
9   var answer2 = 42
10  var answer3 = "Xin Miao"
11  var answer4 = true //boolean
12  alert(" answer1 is:"+answer1+"\r answer2 is:"+answer2+"\r answer3 is:"+answer3+"\r answer4 is:"+answer4)
13
14  answer1=answer2
15  answer3=false //redefine to boolean
16  answer4="True"
17  alert(" answer1 is:"+answer1+"\r answer2 is:"+answer2+"\r answer3 is:"+answer3+"\r answer4 is:"+answer4)
18 </script>
19 </body>
20 </html>
```

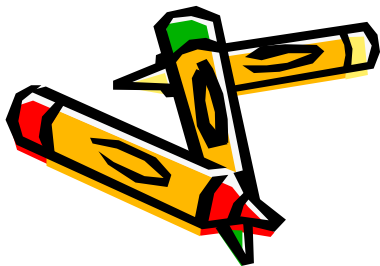
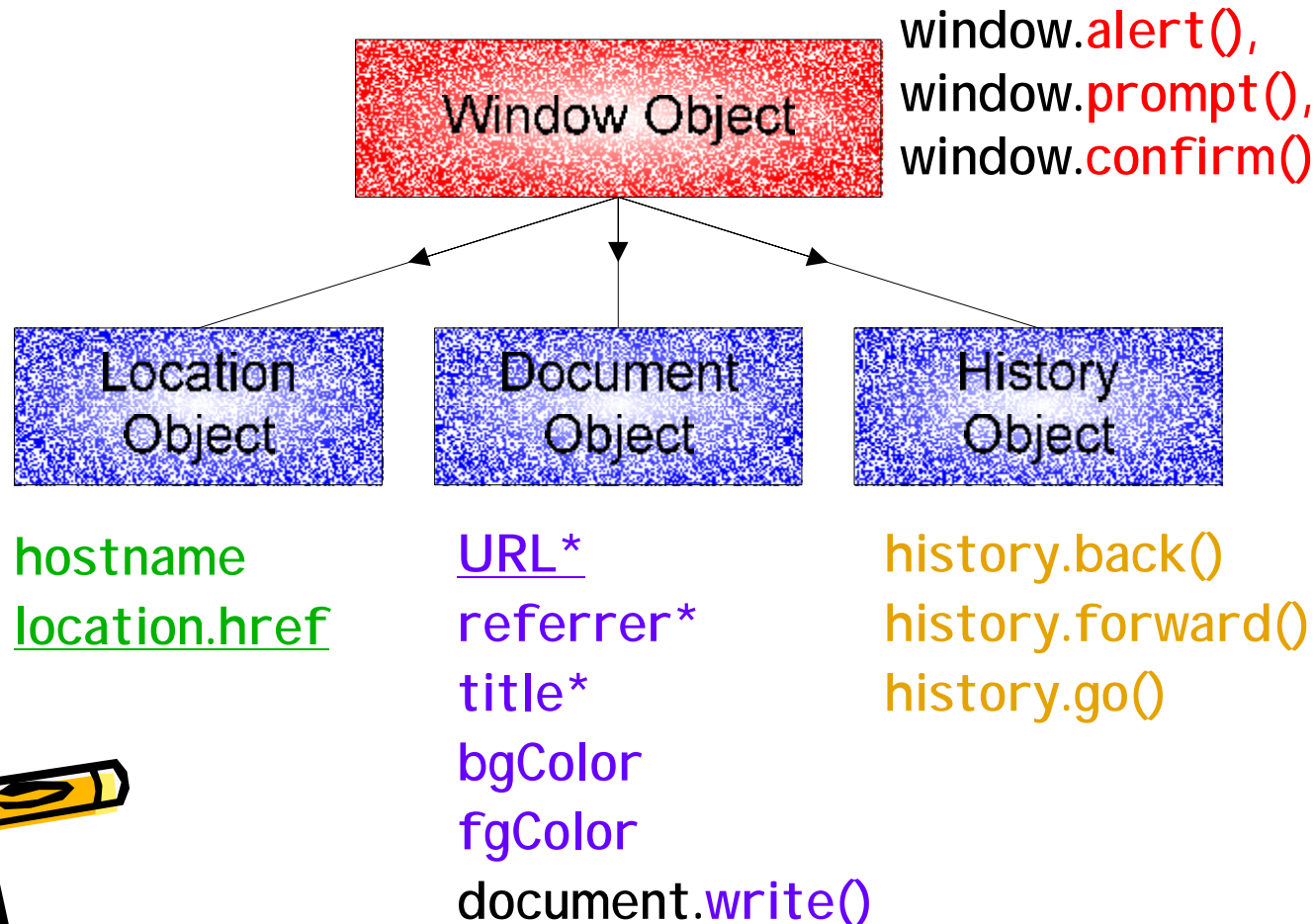
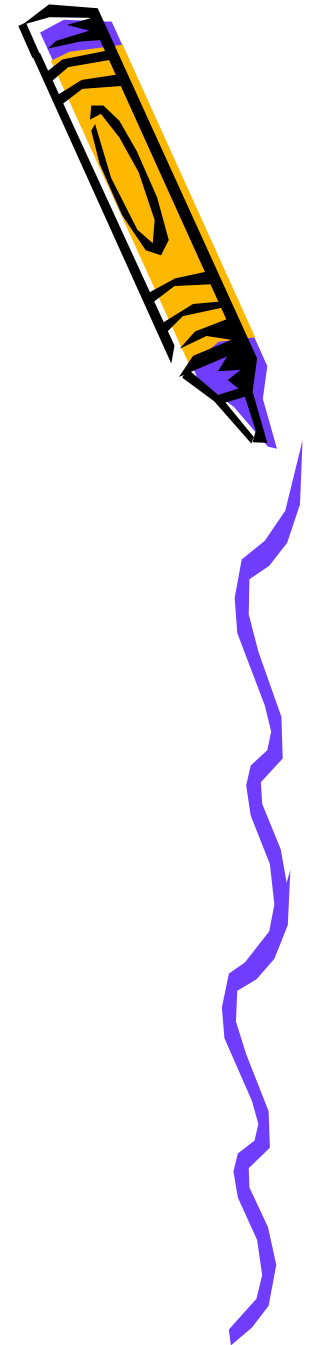


# Returning a value

```
1 <html>
2 <head>
3   <title>Returning a Value</title>
4 </head>
5 <body>
6 <p> This is a Demo of Returning a Value from Functions. </p>
7 <script type="text/javascript">
8   var theName
9   var userAnswer
10  theName = prompt("Please enter your name:", "Enter name here")
11  alert("Greetings, " + theName)
12
13  userAnswer= confirm("Are you sure you want to do that?")
14  alert(" Your response was: " + userAnswer)
15 </script>
16 </body>
17 </html>
```

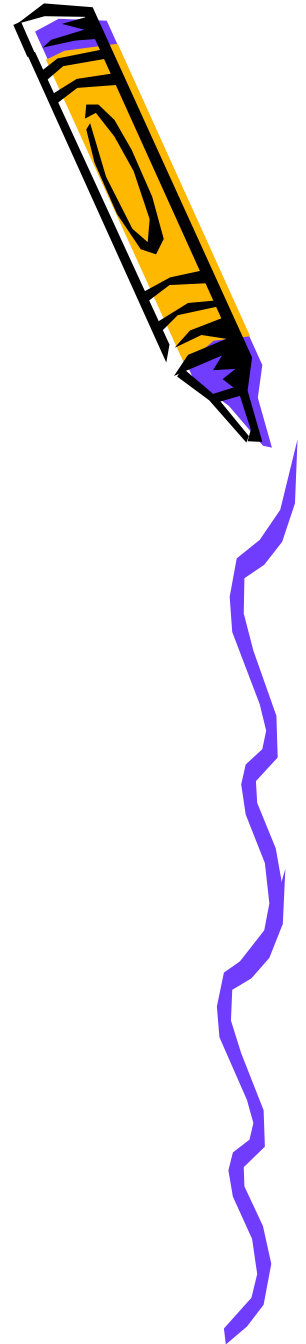


# Document Object Model (DOM)



# Summary

- OOP concepts, terminology and syntax;
- Variables: types, name and value; initialize and change the value;
- DOM of a web browser.



# Quiz:

- 1) A object consists of two parts:  
         and         .
- 2) Variable type?
  - `var number = "0.1"`
  - `var flag = "true"`
- 3) Are these assignment statements correct?
  - `document.title = "My new homepage"`
  - `document.bgcolor = "red"`

