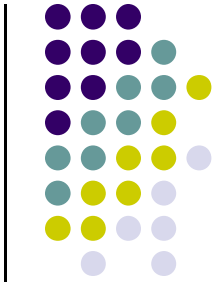
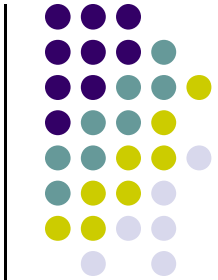
Functions, Part 1 of 2



Topics

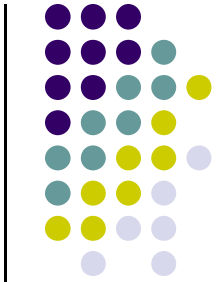
- Using Predefined Functions
- Programmer-Defined Functions
- Using Input Parameters
- Function Header Comments

Review of Structured Programming



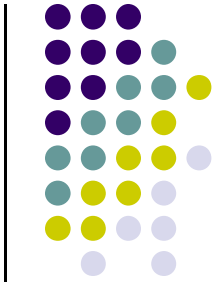
- Structured programming is a problem solving strategy and a programming methodology that includes the following guidelines:
  - The program uses only the sequence, selection, and repetition control structures.
  - The flow of control in the program should be as simple as possible.
  - The construction of a program embodies top-down design.

Functions



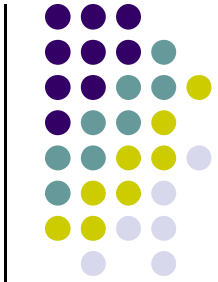
- When program control encounters a function name, the function is **called** (**invoked**).
  - Program control passes to the function.
  - The function is executed.
  - Control is passed back to the place where the function was called.

Functions



- We have used several predefined functions so far:
  - alert()
  - prompt()
  - document.write()
  - toFixed()
  - parseInt()
  - parseFloat()
- Programmers can write their own functions.
- Typically, each module in a program's design hierarchy chart is implemented as a function.

Sample Function Call



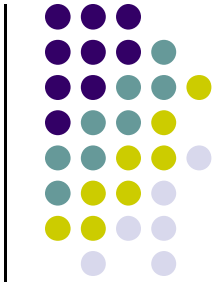
alert is the name of a **predefined function** in the JavaScript language

```
alert("Hello World!");
```

this statement is is known as a **function call**

this is a string we are **passing** as an **argument** (**parameter**) to the alert function

Sample Programmer-Defined Function



```
<head>
<title>Function Example</title>
<script type="text/javascript">
  <!--
   function PrintMessage()
   {
     alert("A message for you:\n\nHave a nice day!");
   }
  //-->
</script>
</head>

<body>
 <script type="text/javascript">
    <!--
       PrintMessage();
    //-->
  </script>
</body>
```

Screenshot of Function Example

Examining PrintMessage()

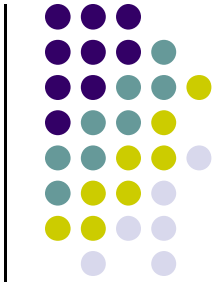
```
<head>
<title>Function Example</title>
<script type="text/javascript">
  <!--
   function PrintMessage()
   {
     alert("A message for you:\n\nHave a nice day!");
   }
  //-->
</script>
</head>

<body>
 <script type="text/javascript">
    <!--
       PrintMessage();
    //-->
  </script>
</body>
```

Function Definition

Function Call

The Function Call

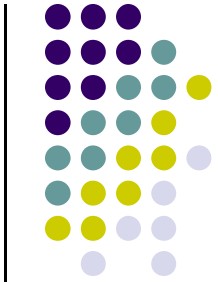


- Passes program control to the function
- Must match the definition in name and number of arguments

```
      ........
   function PrintMessage()
   {
     alert("A message for you:\n\nHave a nice day!");
   }
      ........
<body>
  <script type="text/javascript">
    <!--
       PrintMessage();
    //-->
  </script>
</body>
```

Same name and no arguments (nothing inside of the parentheses)

The Function Definition

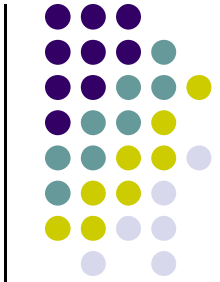


- Control is passed to the function by the function call. The statements within the function body will then be executed.

```
function PrintMessage()
{
  alert("A message for you:\n\nHave a nice day!");
}
```

- After the statements in the function have completed, control is passed back to the **place where the function was called**.

General Function Definition Syntax



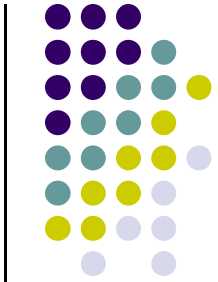
function FunctionName (*parameter*$_1$, . . . , *parameter*$_n$)
{
    variable declaration(s)
    statement(s)
}

- If there are no parameters, there should be nothing inside of the ()'s

```
function FunctionName()
{
    ...
}
```

- There may be no variable declarations.

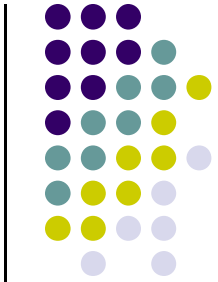
Using Input Parameters



- Often it is the case that we would like to be able to share information with the function.
- It is possible to send input parameters into the function.
- We can pass information from the place where the function is called.
- The next slide illustrates sending a single parameter into a function.

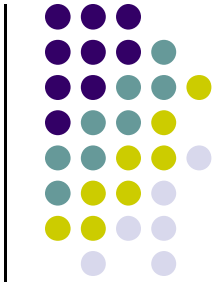
```
<head>
<title>Function Parameter Example</title>
<script type="text/javascript">
  <!--
   function PrintMessage(counter)
   {
     var i;
     for(i = 1; i <= counter; i = i + 1)
     {
       alert("Have a nice day!");
     }
   }
  //-->
</script>
</head>
<body>
  <script type="text/javascript">
    <!--
       var counter;
       counter = prompt("Enter a number:");
       PrintMessage(counter);
    //-->
  </script>
</body>
```

Good Programming Practice



- You should include a **function header comment** before the definition of each function.
- This is a good practice and is required by the 104 Coding Standards.
- Your header comments should be neatly formatted and contain the following information:
  - function name
  - function description (what it does)
  - a list of any input parameters and their meanings
  - a list of any output parameters and their meanings
  - a description of any special conditions

Example of a Function Header Comment



```
/*************************************************************
** PrintMessage - prints a message a specified number of times
** Inputs: counter - the number of times the message will be
**                   printed
** Outputs:  None
*************************************************************/
function PrintMessage(counter)
{
    var i;
     for(i = 1; i <= counter; i = i + 1)
     {
       alert("Have a nice day!");
     }
}
```