Fundamentals of Computer Programming 2  
Notes and Practice Problems – Aug 1, 2003

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Some useful (predefined) functions

<table>
<thead>
<tr>
<th>Function name</th>
<th>argument type/s</th>
<th>return type</th>
<th>library</th>
</tr>
</thead>
<tbody>
<tr>
<td>floor(x)</td>
<td>double</td>
<td>int</td>
<td>cmath</td>
</tr>
<tr>
<td>ceil(x)</td>
<td>double</td>
<td>int</td>
<td>cmath</td>
</tr>
<tr>
<td>sqrt(x)</td>
<td>double</td>
<td>double</td>
<td>cmath</td>
</tr>
<tr>
<td>strlen(s)</td>
<td>char array</td>
<td>int</td>
<td>cstring</td>
</tr>
<tr>
<td>strcmp(s1,s2)</td>
<td>2 char arrays</td>
<td>bool</td>
<td>cstring</td>
</tr>
</tbody>
</table>

Syntax for user defined functions

\[ \begin{align*} 
\text{Return-Type Func-name}(\text{Type1 arg1, …}) & \{ \\
\& P; \\
\} 
\end{align*} \]

Array declarations

\[ \begin{align*} 
\text{Type Var-name}\{\text{integer constant}\}; 
\end{align*} \]

Problems

1. Write a function that takes as input an array of real numbers and returns their mean (average).

2. Use the above function to write a program that calculates the mean of the n’th powers of an array of integers input by the user (n is also specified by the user).

3. Use the function in (1) to calculate the mean and standard deviation of an array of real numbers input by the user.

4. Write a program that takes as input 3 strings and sorts them in alphabetical order. (assume all the strings consist only of lower case alphabets).

Note

Most versions of C++ already have a built in function pow(x,y) which returns the value \( x^y \) (x,y, can be of the type “double”). Just for fun, don’t use this function for (2). Write you own function for calculating \( k^n \) where \( k, n \) are integers.