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Fall 218

CS 315 Homework #1

Arrays in C

1. What types are legal for subscripts?
In C only integer types such as signed, long, short, etc. are allowed for index (subscript) types.

2. Are subscripting expressions in element references range checked?
Index range checking is not specified in C.

3. When are subscript ranges bound?
C arrays that include static modifier are static and bound at compile time
C arrays without static modifier are fixed stack-dynamic and bound at compile time
C provides fixed heap-dynamic arrays and bound at runtime.

4. When does allocation take place?
C allows initialization at the time of storage allocation. For static items allocation takes place at load time and for stack-dynamic and heap-dynamic it takes place at runtime.

5. Are ragged or rectangular multidimensional arrays allowed, or both?
C supports jagged arrays but not rectangular arrays.

6. What is the maximum number of subscripts?
Maximum number of subscripts in C has no limitations.

7. Can array objects be initialized?
Yes, it is possible to initialize some or all elements of an array when the array is defined. If there are fewer initializers than elements in the array, the remaining elements are automatically initialized to 0. Also for the dynamic arrays the initialization is not possible at the decleration.

8. Are any kind of slices supported?
No such built-in mechanism for array slicing in C

Arrays in Python

1. What types are legal for subscripts?
In Python only integers and slices are allowed for index (subscript) types. In the case of dictionaries and tuples since they also use the "[]" subscript notation strings are also accepted.

2. Are subscripting expressions in element references range checked?
Index range checking is supported in Python and Python supports negative indexing. If i is negative, len(list) + i is substituted.

3. When are subscript ranges bound?
Python supports heap-dynamic arrays therefore binding of subscript ranges is dynamic and bound at runtime.

4. When does allocation take place?
Python supports heap-dynamic arrays therefore storage allocation is dynamic and can change any number of times and it takes place at runtime.

5. Are ragged or rectangular multidimensional arrays allowed, or both?
Python supports jagged arrays but not rectangular arrays.

6. What is the maximum number of subscripts?
Python has no limit for the maximum number of subscripts.

7. Can array objects be initialized?
Array objects can be initialized in Python.

8. Are any kind of slices supported?
Python supports slices.

Arrays in Perl

1. What types are legal for subscripts?
In Perl only integer types are allowed for index (subscript) types. However, strings are also accepted but they return the first element at index 0.

2. Are subscripting expressions in element references range checked?
Index range checking is not specified in Perl and Perl supports negative indexing. If index is negative the element is substituted as size of the list + index.

3. When are subscript ranges bound?
Perl supports heap-dynamic arrays therefore binding of subscript ranges is dynamic and bound at runtime.

4. When does allocation take place?
Perl supports heap-dynamic arrays therefore storage allocation is
dynamic and can change any number of times and it takes place at runtime.

5. Are ragged or rectangular multidimensional arrays allowed, or both?
Perl supports jagged arrays but not rectangular arrays.

6. What is the maximum number of subscripts?
Perl has no limit for the maximum number of subscripts.

7. Can array objects be initialized?
Array objects can be initialized in Perl.

8. Are any kind of slices supported?
Perl supports slices.

Arrays in JavaScript

1. What types are legal for subscripts?
JavaScript all types i.e. integer, string, float, boolean, null, symbol are allowed for index (subscript) types. However, although JavaScript accepts these types are legel except for the integers they all return undefined.

2. Are subscripting expressions in element references range checked?
Index range checking is not specified in JavaScript.

3. When are subscript ranges bound?
JavaScript supports heap-dynamic arrays therefore binding of subscript ranges is dynamic and bound at runtime.

4. When does allocation take place?
JavaScript supports heap-dynamic arrays therefore storage allocation is dynamic and can change any number of times and it takes place at runtime.

5. Are ragged or rectangular multidimensional arrays allowed, or both?
JavaScript supports jagged arrays but not rectangular arrays.

6. What is the maximum number of subscripts? no limit
JavaScript has no limit for the maximum number of subscripts.

7. Can array objects be initialized?
Array objects can be initialized in JavaScript.

8. Are any kind of slices supported? slice
JavaScript supports slices.

Arrays in PHP

1. What types are legal for subscripts?
In PHP types such as integer, float, null, character are allowed for index (substript) types.

2. Are subscripting expressions in element references range checked?
index range checking is not specified in php.

3. When are subscript ranges bound?
PHP supports heap-dynamic arrays therefore binding of subscript ranges is dynamic and bound at runtime.

4. When does allocation take place?
PHP supports heap-dynamic arrays therefore storage allocation is dynamic and can change any number of times and it takes place at runtime.

5. Are ragged or rectangular multidimensional arrays allowed, or both?
PHP supports jagged arrays but not rectangular arrays
Defining a multidimensional array

6. What is the maximum number of subscripts?
PHP has no limit for the maximum number of subscripts.

7. Can array objects be initialized?
Array objects can be initialized in PHP.

8. Are any kind of slices supported?
PHP supports slices.

Which language is best for array operations?

Among these five programming languages python would be best suitable for array operations. First of all among readability and writability python is better than the other languages which makes large data structures more manageable. Also it supports range checking while the others don't so that programs are more maintainable and less error prone. Also the additional array package adds more sophisticated array calculations and operations. Because of these reasons it's best for the array operations.