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TCS interview questions and answers for freshers 2011-2012 | Latest

September 20, 2011 Gaurav No comments (http://www.searchcrone.com/2011/09/tcs-interview-questions-and-answers-for-freshers-2011-2012-latest#respond)

Hi friends,

Recently TCS has conducted various campus drive in lots of colleges and selected students in huge quantity. We have collected lots of interview questions from our site reader which is asked by TCS in 2011-2012 on campus placement drive.

We want to share these questions with you with solutions. We hope these will help to you in future TCS placement drive for 2011-2012 freshers.

Disadvantage in File Processing System?

ANSWER:

Data redundancy & inconsistency.

Difficult in accessing data.

Data isolation.

Data integrity.

Concurrent access is not possible.

Security Problems. .

Describe the three levels of data abstraction?

ANSWER:

The are three levels of abstraction:

Physical level: The lowest level of abstraction describes how data are stored.

Logical level: The next higher level of abstraction, describes what data are stored in database and what relationship among those data.

View level: The highest level of abstraction describes only part of entire database.

Define the "integrity rules"

ANSWER:

There are two Integrity rules.

Entity Integrity: States that ?Primary key cannot have NULL value?

Referential Integrity: States that ?Foreign Key can be either a NULL value or should be Primary Key value of other relation.

List out the areas in which data structures are applied extensively?

Compiler Design, Operating System, Database Management System, Statistical analysis package, Numerical Analysis, Graphics, Artificial Intelligence, Simulation

If you are using C language to implement the heterogeneous linked list, what pointer type will you use?

The heterogeneous linked list contains different data types in its nodes and we need a link, pointer to connect them. It is not possible to use ordinary pointers for this. So we go for void pointer. Void pointer is capable of storing pointer to any type as it is a generic pointer type.

What is the data structures used to perform recursion?

Stack. Because of its LIFO (Last In First Out) property it remembers its caller, so knows whom to return when the function has to return. Recursion makes use of system stack for storing the return addresses of the function calls. Every recursive function has its equivalent iterative (non-recursive) function. Even when such equivalent iterative procedures are written, explicit stack is to be used.

What is a spanning Tree?

A spanning tree is a tree associated with a network. All the nodes of the graph appear on the tree once. A minimum spanning tree is a spanning tree organized so that the total edge weight between nodes is minimized.

Whether Linked List is linear or Non-linear data structure?

According to Access strategies Linked list is a linear one. According to Storage Linked List is a Non-linear one.

What is the quickest sorting method to use?

The answer depends on what you mean by quickest. For most sorting problems, it just doesn't matter how quick the sort is because it is done infrequently or other operations take significantly more time anyway. Even in cases in which sorting speed is of the essence, there is no one answer. It depends on not only the size and nature of the data, but also the likely order. No algorithm is best in all cases. There are three sorting methods in this author's toolbox that are all very fast and that are useful in different situations. Those methods are quick sort, merge sort, and radix sort.

The Quick Sort

The quick sort algorithm is of the divide and conquer type. That means it works by reducing a sorting problem into several easier sorting problems and solving each of them. A dividing value is chosen from the input data, and the data is partitioned into three sets: elements that belong before the dividing value, the value itself, and elements that come after the dividing value. The partitioning is performed by exchanging elements that are in the first set but belong in the third with elements that are in the third set but belong in the first Elements that are equal to the dividing element can be put in any of the three sets the algorithm will still work properly.

The Merge Sort

The merge sort is a divide and conquer sort as well. It works by considering the data to be sorted as a sequence of already-sorted lists (in the worst case, each list is one element long). Adjacent sorted lists are merged into larger sorted lists until there is a single sorted list containing all the elements. The merge sort is good at sorting lists and other data structures that are not in arrays, and it can be used to sort things that don't fit into memory. It also can be implemented as a stable sort.

The Radix Sort

The radix sort takes a list of integers and puts each element on a smaller list, depending on the value of its least significant byte. Then the small lists are concatenated, and the process is repeated for each more significant byte until the list is sorted. The radix sort is simpler to implement on fixed-length data such as ints.

How can I search for data in a linked list?

Unfortunately, the only way to search a linked list is with a linear search, because the only way a linked list's members can be accessed is sequentially. Sometimes it is quicker to take the data from a linked list and store it in a different data structure so that searches can be more efficient.

What is the heap?

The heap is where malloc(), calloc(), and realloc() get memory.

Getting memory from the heap is much slower than getting it from the stack. On the other hand, the heap is much more flexible than the stack. Memory can be allocated at any time and deallocated in any order. Such memory isn't deallocated automatically; you have to call free().

Recursive data structures are almost always implemented with memory from the heap. Strings often come from there too, especially strings that could be very long at runtime. If you can keep data in a local variable (and allocate it from the stack), your code will run faster than if you put the data on the heap. Sometimes you can use a better algorithm if you use the heap faster, or more robust, or more flexible. Its a tradeoff.

If memory is allocated from the heap, its available until the program ends. That's great if you remember to deallocate it when you're done. If you forget, it's a problem. A memory leak is some allocated memory that's no longer needed but isn't deallocated. If you have a memory leak inside a loop, you can use up all the memory on the heap and not be able to get any

more. (When that happens, the allocation functions return a null pointer.) In some environments, if a program doesn't deallocate everything it allocated, memory stays unavailable even after the program ends.

What is the easiest sorting method to use?

The answer is the standard library function qsort(). It's the easiest sort by far for several reasons:

It is already written.

It is already debugged.

It has been optimized as much as possible (usually).

Void qsort(void *buf, size_t num, size_t size, int (*comp)(const void *ele1, const void *ele2));

When can you tell that a memory leak will occur?

A memory leak occurs when a program loses the ability to free a block of dynamically allocated memory.

List out the areas in which data structures are applied extensively?

Compiler Design, Operating System, Database Management System, Statistical analysis package, Numerical Analysis, Graphics, Artificial Intelligence, Simulation

What is the data structures used to perform recursion?

Stack. Because of its LIFO (Last In First Out) property it remembers its caller so knows whom to return when the function has to return. Recursion makes use of system stack for storing the return addresses of the function calls. Every recursive function has its equivalent iterative (non-recursive) function. Even when such equivalent iterative procedures are written, explicit stack is to be used.

Whether Linked List is linear or Non-linear data structure?

According to Access strategies Linked list is a linear one.

According to Storage Linked List is a Non-linear one

Tell how to check whether a linked list is circular?

Create two pointers, each set to the start of the list. Update each as follows:

```
while (pointer1)
{
pointer1 = pointer1->next;
pointer2 = pointer2->next; if (pointer2) pointer2=pointer2->next;
if (pointer1 == pointer2)
??????{
print (\"circular\n\");
}
}
```

What is the difference between ARRAY and STACK?

STACK follows LIFO. Thus the item that is first entered would be the last removed.

In array the items can be entered or removed in any order. Basically each member access is done using index. No strict order is to be followed here to remove a particular element.

What is the difference between NULL AND VOID pointer?

NULL can be value for pointer type variables.

VOID is a type identifier which has not size.

NULL and void are not same. Example: void* ptr = NULL;

What is precision?

Precision refers the accuracy of the decimal portion of a value. Precision is the number of digits allowed after the decimal point.

What is impact of signed numbers on the memory?

Sign of the number is the first bit of the storage allocated for that number. So you get one bit less for storing the number. For example if you are storing an 8-bit number, without sign, the range is 0-255. If you decide to store sign you get 7 bits for the number plus one bit for the sign. So the range is -128 to +127.

How many parts are there in a declaration statement?

There are two main parts, variable identifier and data type and the third type is optional which is type qualifier like signed/unsigned.

Is Pointer a variable?

Yes, a pointer is a variable and can be used as an element of a structure and as an attribute of a class in some programming languages such as C++, but not Java. However, the contents of a pointer is a memory address of another location of memory, which is usually the memory address of another variable, element of a structure, or attribute of a class.

What is Data Structure?

A data structure is a group of data elements grouped together under one name. These data elements, known as members, can have different types and different lengths. Some are used to store the data of same type and some are used to store different types of data.

What is significance of "*"?

The symbol "*" tells the computer that you are declaring a pointer.

Actually it depends on context.

In a statement like int *ptr; the `*' tells that you are declaring a pointer.

In a statement like int i = *ptr; it tells that you want to assign value pointed to by ptr to variable i.

The symbol "*" is also called as Indirection Operator/ Dereferencing Operator.

Why do we Use a Multidimensional Array?

A multidimensional array can be useful to organize subgroups of data within an array. In addition to organizing data stored in elements of an array, a multidimensional array can store memory addresses of data in a pointer array and an array of pointers.

Multidimensional arrays are used to store information in a matrix form.

e.g. a railway timetable, schedule cannot be stored as a single dimensional array.

One can use a 3-D array for storing height, width and length of each room on each floor of a building.

How do you assign an address to an element of a pointer array?

We can assign a memory address to an element of a pointer array by using the address operator, which is the ampersand (&), in an assignment statement such as ptemployee[0] = &projects[2];

What method is used to place a value onto the top of a stack?

push() method, Push is the direction that data is being added to the stack. push() member method places a value onto the top of a stack.

What method removes the value from the top of a stack?

The pop() member method removes the value from the top of a stack, which is then returned by the pop() member method to the statement that calls the pop() member method.

What is a queue ?

A Queue is a sequential organization of data. A queue is a first in first out type of data structure. An element is inserted at the last position and an element is always taken out from the first position.

Which process places data at the back of the queue?

Enqueue is the process that places data at the back of the queue.

What is Linked List?

Linked List is one of the fundamental data structures. It consists of a sequence of? nodes, each containing arbitrary data fields and one or two ("links") pointing to the next and/or previous nodes. A linked list is a self-referential datatype because it contains a pointer or link to another data of the same type. Linked lists permit insertion and removal of nodes at any point in the list in constant time, but do not allow random access.

What are the major data structures used in the following areas : RDBMS, Network data model & Hierarchical data model.

- 1. RDBMS Array (i.e. Array of structures)
- 2. Network data model Graph
- 3. Hierarchical data model Trees.

Difference between calloc and malloc?

malloc: allocate n bytes

calloc: allocate m times n bytes initialized to 0

What are the different storage classes in C?

C has three types of storage: automatic, static and allocated.

Variable having block scope and without static specifier have

automatic storage duration.

Variables with block scope, and with static specifier have static scope.

Global variables (i.e, file scope) with or without the static specifier also

have static scope.

Memory obtained from calls to malloc(), alloc() or realloc() belongs to allocated storage class.

Can static variables be declared in a header file?

You can't declare a static variable without defining it as well (this is because the storage class modifiers static and extern are mutually exclusive). A static variable can be defined in a header file, but this would cause each source file that included the header file to have its own private copy of the variable, which is probably not what was intended.

What is a null pointer?

There are times when it's necessary to have a pointer that doesn't point to anything. The macro NULL, defined in , has a value that's guaranteed to be different from any valid pointer. NULL is a literal zero, possibly cast to void* or char*. Some people, notably C++ programmers, prefer to use 0 rather than NULL.

The null pointer is used in three ways:

- 1) To stop indirection in a recursive data structure
- 2) As an error value
- 3) As a sentinel value

If you are not from Computer science or information technology branch then they will ask about your branch subject tricky questions. So don't worry about C,Data structures if you are non CS & IT branch student.

Above we have shared few main and basic interview questions recently asked in TCS placement drive for 2011-2012 freshers on Campus.

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