Applications of Data Structures

So where is data structures applied ?

Array

- To represent/implement other data structures in memory
- To store files in memory

Linked Lists

- To represent/implement other data structures in memory
- To manipulate large numbers
- To dynamically allocate space in the main memory
- To allocate blocks in hard disk

Stacks

- To use recursion
- To help you call multiple functions in a program. The called sequence is stored in a stack.
- To convert the arithmetic expressions that you write in a program to computer understandable form (Infix to postfix conversion)
- To evaluate a postfix expression
- Rearranging railroad cars
- To perform undo and redo in a word processor

Queues

- In operating systems, to schedule processes waiting for the CPU
- To process objects in a manufacturing line
- Handling key presses and mouse events in a keyboard and mouse respectively
- A call centre takes calls from customers, queues it and distributes calls to agents
- Jukeboxes help users to select a song. The songs selected form a queue
- Handling of interrupts by the operating system
- To store the browsing history

Trees

- Auto complete features (Trie)
- For easier substring matching
- For metadata indexing in file systems (B+ tree)
- To maintain table indices in relational database systems (B+ tree)
- Store dictionary in a mobile (Trie)

- To check spellings (Trie)
- To construct associative array (Red black trees)
- To ensure direct access of data blocks in file systems (B tree)
- Used by compilers to check the syntax of a statement in a program (Parse Trees)
- Used by operating systems to maintain the structure of a file system

Heaps

- To implement priority queues
- To sort numbers using heap sort

Graphs

- To fill a MSPaint object with some colour
- To find the shortest route from your workplace to home
- To decide the amount of cable while setting a computer lab
- Connections and relations in social networking sites
- Spread of viruses
- Electrical power grids
- Citation of journals

More interesting examples are given in the following link.

http://www.graph-magics.com/practic_use.php [http://www.graph-magics.com/practic_use.php]

Table

- To store the records of all the employees
- To create the yellow pages

Posted 1st October 2012 by Lovelyn

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