

CS 14 - Summer 2003 - Quiz 1

June 30, 2003

1 True/False

Circle *T* or *F* as appropriate. Running-time questions are all in terms of input size n

1. **T F** n^3 grows faster than $n^2 \log_{42} n$
2. **T F** n grows faster than $n \log m$
3. **T F** 2^{2n} grows faster than 3^n
4. **T F** A *stack* is a FIFO.
5. **T F** A *stack* built using ADT List adds to a different end of the list than it removes from.
6. **T F** A *stack* using a linked-list can be implemented so that both the *push* and *pop* operations can be done in $O(1)$ time.
7. **T F** A *queue* is a FIFO.
8. **T F** A *queue* can be efficiently ($O(1)$) implemented as a singly-linked list.

2 Multiple Choice

Circle the letter of the correct answer. Running-time questions are all in terms of input size n

1. For ADT List, which of these is not part of the basic set of operations?
 - (a) Size
 - (b) Insert At Tail
 - (c) isEmpty
 - (d) Delete

3. When using only the ADT List interface with no Iterators, what is the running time of a function that prints out the values of a singly-linked list and why?

4. What is the Big-O running time of this code:

```
void order(vector<int>& nums)
{
    for (unsigned int i = 0; i < nums.size(); i++)
    {
        int s = nums[i];
        int sInd = i;
        for (unsigned int j = i + 1; j < nums.size(); j++)
        {
            if (nums[j] < s)
            {
                sInd = j;
                s = nums[j];
            }
        }
        swap(nums[i], nums[sInd]); // This is a constant-time op
    }
}
```