

1. Write a C loop for each of the following run times:
  - $O(n)$
  - $O(n^3)$
  - $O(\log(n))$
2. What is memoization, and why is it beneficial? Give an example.
3. Fill in the following C function, which should count all nodes in a BST that contain a string that begins with the letter 'S':

```
typedef struct node {  
    char *s;  
    struct node *left, *right;  
} bst_node_t;  
  
int count_s_strings(bst_node_t *tree)  
{  
}
```

What is the run time of this function with respect to  $n$ , the number of nodes in the tree?