

**COMP 304**  
**Assignment 1**  
**Due 7 pm, Tuesday, September 16, 2008**  
All problems are of equal value.

## Reading

Cormen, Leiserson, Rivest and Stein, Chapters 1, 2, & 3.

## Practice

CLRS, 1.2-2, 1-1, 2.1-1, 2.1-2, 2.2-1, 2.2-3, 2.2-4, 2.3-4, 2-4, 3.1-1...8, 3.2-1, 3.2-5, 3-1, 3-3, 3-4 (c)-(f), 3-5, A-1

## To Be Handed In

1. CLRS, 1.2-3
2. CLRS, 2.1-4. In addition to solving the problem as stated, express the running time (as a function of  $n$ ) of your algorithm using  $\Theta$ -notation.
3. Express the running time (as a function of  $n$ ) of the following pseudo-code algorithms using  $\Theta$ -notation.

```
r = 0
i = n*n
while i > 1 do
  for j = 1 to i do
    r = r + 1
  i = i/2
```

Please note:  $i/2$  is  $\lfloor i/2 \rfloor$ , the integer part of  $i/2$ .

4. CLRS, 3-2
5. CLRS, 3-4 (a), (b), (g), (h)

## Bonus

You are given a large supply of one hour fuses for explosives. They are essentially pieces of string each of them guaranteed to burn for precisely one hour. They are of varying length since a fuse does not burn at the same rate all of the time, i.e., a piece of fuse might burn quickly for some time and then slowly, etc., varying any number of times in one hour. You do not have a watch or access to any timing device. You have discovered a way to blow me up but for the plan to be successful you need a fuse that burns for precisely twenty-two minutes and thirty seconds. How do you do it?