Homework No. 5
Due Date: February 4, 2005 at the beginning of the class exam
A late turn-in will not be accepted

1) Analyze the following pseudo code and provide a complexity analysis and explanation to support your answer. (10%)

Tri(n) pseudo code
i. If n = 1 Tri(n) = 1
ii. If n > 1 Tri(n) = Tri(n – 1) + n

2) Convert the above recursion code in 1) to loop implementation (70 %). Run both programs by incrementing n from 1 to the large number that may break your program. Determine what causes the problem

3) Assuming that a cost of each function invocation is as follows: (20%)
   - 200 ms execution time
   - 200 KB space

Each statement execution cost is
    o 1 ms
    o 20 KB

```
fac_rec (int n)
{ if n == 0 return 1;
  else return (n * fac_rec (n -1));
}

fac_loop (int n)
{ int i,j;
  if n == 0 return 1;
  else {
    for (i = 1; i < n + 1; i++) {
      j =*i;
    }
  }
  return j;
}
```

Calculate and compare each invocation of fac_rec(5) vs. fac_loop(5) in both time and space complexity aspects.