# CSCI 241: Runtime Analysis Practice Problems

The pseudo-code “for i in 0..N” implies the loop “for(i = 0; i < N; i++)”.

<table>
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| 1.      | Max = A[0]  
          for i in 1..N:  
                if A[i] > max:  
                    max = A[i] |
| 2.      | for i in N..0:  
                if A[i] == 5:  
                    return i; |
| 3.      | for i in 0..N:  
                for j in N..0:  
                    print “hello” |
| 4.      | for i in 0..N:  
                for j in i..N:  
                    c += a + b |
| 5.      | for i in start..end:  
                A[i] = sqrt(pow(a,2),pow(b,2)) |
| 6.      | i = 0  
          while i < N:  
                i *= 2  
                doesSomethingCool() => O(N) |
| 7.      | pal(s){  
                if(len(s) < 2):  
                    return true  
                if(s[0] != s[len(s)-1]):  
                    return false  
                return pal(s[1..len(s)-1]) |
| 8.      | i = N  
          j = N  
          while i > 0:  
                i /= 2  
          while j > 0:  
                j -= 2 |
| 9.      | SelectionSort:  
                for i in 0..N:  
                    min = A[i]  
                    for j in i..N:  
                        if A[j] < min:  
                            min = A[j]  
                            j_min = j  
                    swap(A, i, j_min) |
| 10.     | InsertionSort:  
                for i in 0..N:  
                    walkDownToPosition(A[i]) => ? |
| 11.     | for i_0 in 0..N:  
                for i_1 in 1..N:  
                    for i_2 in 2..N:  
                    .  
                    .  
                    .  
                for i_n in N..N:  
                    for i_k in 0..N: |
| 12.     | for i_0 in 0..N:  
                for i_1 in 0..N:  
                    for i_2 in 0..N:  
                    .  
                    .  
                    .  
                    .  
                for i_k in 0..N: |
| 13.     | recursion(start, end){  
                for i in start..end:  
                    print "13"  
                recursion(start, end/2) |
| 14.     | i = 0; j = 0; k = N;  
                while i < N:  
                    i *= 2  
                while j < N:  
                    j *= 3  
                while k > 1:  
                    k /= 4 |