Big O Notation in order of increasing runtime

O(0)
O(2/N)
O(5)
O(log N)
O(SQRT(N))
O(NM), O(N)
O(N log(N))
O(N^1.5)
O(N^2)
O(N^4)
O(2^N)
O(∞)

Complexity of the codes in HW document

1)sum = 0;
  for (i = 0; i < n; i++) {
      sum++;
  }
 line 1 = +1
line 2 = (2n+2) with addition of line3 = n sums
t(n) = 3n + 3 which reduces to O(N)

2)sum = 0;
  for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            sum++;
        }
  }
line 1 = +1
line 2 = (2n+2)
line 3 = ((2n+2) with addition of line 3 = n sums
t(n)= (2n + 2)(3n + 2) = 6n^2 + 10n + 4 which reduces to O(N^2)

3) sum = 0;
    for (i = 0; i < n; i++) {
          for (j = 0; j < i; j++) {
              sum++;
           }
  }
line 1 = +1
line 2 = (2n+2)
line 3 = ((2n+2)/2 which = n+1 with addition of line 3 = n sums
t(n) = (2n+1)(2n+1) = 4n^2 + 4n + 1 which reduces to O(N^2)

4)sum = 0;
 for (i = 0; i < n * n; i++) {
       for (j = 0; j < n * n; j++) {
            sum++;
       }
 }
line 1 = +1
line 2 = (2n+2)
line 3 = (n^2 + n +1) with addition of line 3 = n sums
t(n) = (2n + 1)(n^2 +2n +1) = 2n^3 +3n^2 +2n +1 which reduces to O(N^3)