

Part 1 . Analyze the given snippet of code what is the time complexity  
(make it step by step )

**(a) sum = 0;**

**for(i=1; i<=2\*n; i++)**

**sum = sum + 1;**

**(b) sum = 0;**

**for(i=1; i<=n\*n; i++)**

**sum = sum + 1;**

**(c) sum=0;**

**for(i=1; i<=n; i++)**

**sum = sum + n;**

**(d) sum = 0;**

**for(i=1; i<=n i++)**

**for(j=1; j<=i; j++)**

**sum = sum + i;**

**(e) sum = 0;**

**for(i=1; i<=100; i++)**

**for(j=1; j<=n; j++)**

**sum = sum + i;**

**(f) sum = 0;**

**for(i=1; i<=n; i++)**

**for(j=1; j<=n; j\*=2)**

**sum = sum + 1;**

Part 2.

1. Analyze the merge sort algorithm extract and give the time complexity of the algorithm (do it step by step)
2. Analyze the insertion sort algorithm extract and give the time complexity of the algorithm (do it step by step)
3. Analyze your code in our Sieve of Eratosthenes activity extract and give the time complexity of the algorithm (do it step by step)