CS305: Homework 1

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1 Question 1

$$\sum_{j=1}^{n} t_j = \frac{n^2 - 2n + 1}{1 + log(n-1)}$$

If $n = 2000$ then the sum is approximately 929126.932813.

2 Question 2

Part a: output gets larger as more pairs are found that are double in value of each other.

Part b: No pairs are found in the array.

Part c: $T(n) : c_1 + log(n)(c_2 + c_3 + c_4 + c_5) + \sqrt{n}(c_6) + c_7$

Part d: $T(n) : c_1 + log(n)(c_2 + c_3 + c_4 + c_5) + c_7$

Part e: $T(n) : c_1 + log(n)(c_2 + c_3 + c_4 + c_5 + c_6) + c_7$

Part f: $O(nlog(n))$ if c_6 is hit at every iteration.

Part g: $O(log(n))$ if c_6 is hit less than c_2 to c_5.