

CS 222

ASSIGNMENT 3: Base b

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When using the digits of the largest of the two base b numbers, the function to add the two positive integers requires a loop. E.g.: For $x = 16 \equiv 1000$ and $y = 8 \equiv 100$ in base $b = 2$, the loop runs by using digits of x since $x > y$, so it runs in 4 steps since x is of 4-digit in base b . So, this loop runs with time complexity $O(\max\{\log_b(x), \log_b(y)\})$. And in each iteration of the loop, integer addition, carry addition and `pop_back()` functions of vector runs with time complexity $O(1)$.

Hence the time complexity of the function is,
 $O(\max\{\log_b(x), \log_b(y)\}) \times O(1 + 1 + 1)$
 $= O(\max\{\log_b(x), \log_b(y)\})$