

CS 10

9-26-08

CS is study of ALGORITHMS

- 1.) MATHEMATICAL PRAP.
- 2.) HARDWARE
- 3.) SOFTWARE
- 4.) APPLICATIONS

EX.
$$\begin{array}{r} 1100 \\ 493 \\ \hline 751 \\ 1244 \end{array}$$

$$\begin{array}{r} 1010 \\ 617 \end{array}$$

$$\begin{array}{r} 945 \\ \hline 1562 \end{array}$$

$$493 = 4 \cdot 10^2 + 9 \cdot 10^1 + 3 \cdot 10^0$$

INPUT: $m \geq 1$ (# digits in two numbers)

$$A = a_{m-1} a_{m-2} \dots a_2 a_1 a_0$$

$$B = b_{m-1} b_{m-2} \dots b_2 b_1 b_0$$
 } Two m-Digit Numbers

i.e.
$$A = a_{m-1} \cdot 10^{m-1} + a_{m-2} \cdot 10^{m-2} + \dots + a_2 \cdot 10^2 + a_1 \cdot 10^1 + a_0 \cdot 10^0$$

$$B = \dots$$

Output: THE SUM C: AN (M+1) DIGIT #

$$C = C_m C_{m-1} \dots C_2 C_1 C_0$$

- 1.) carry ← 0
- 2.) i ← 0
- 3.) while i < m do 4-10
- 4.) $C_i \leftarrow a_i + b_i + \text{carry}$
- 5.) if $C_i \geq 10$ do 6-7
- 6.) $C_i \leftarrow C_i - 10$
- 7.) carry ← 1
- 8.) else do 9
- 9.) carry ← 0
- 10.) i ← i + 1
- 11.) $C_m \leftarrow \text{carry}$
- 12.) Print $C_m C_{m-1} \dots C_2 C_1 C_0$
- 12) END

$$\begin{array}{r} \text{Ex. } 493 \\ 751 \\ \hline 1244 \end{array}$$

$$m = 3$$

$$a_2 = 4, a_1 = 9, a_0 = 3$$

$$b_2 = 7, b_1 = 5, b_0 = 1$$

$$\text{Carry} = 0$$

$$i = 0$$