

CHAPS 10 10-6-08

Exercise:
TRACE SEQ. SEARCH ON

 $n = 5$

target = 2

list: 3, -1, 2, 5, 12
" " " " " "
 a_1 a_2 a_3 a_4 a_5

INPUT: $n \geq 1$ (# of #s)

a_1, a_2, \dots, a_n (The list of #s) (Distinct)
OUTPUT: THE LARGEST VALUE IN THE LIST, TOGETHER WITH ITS LOCATION.

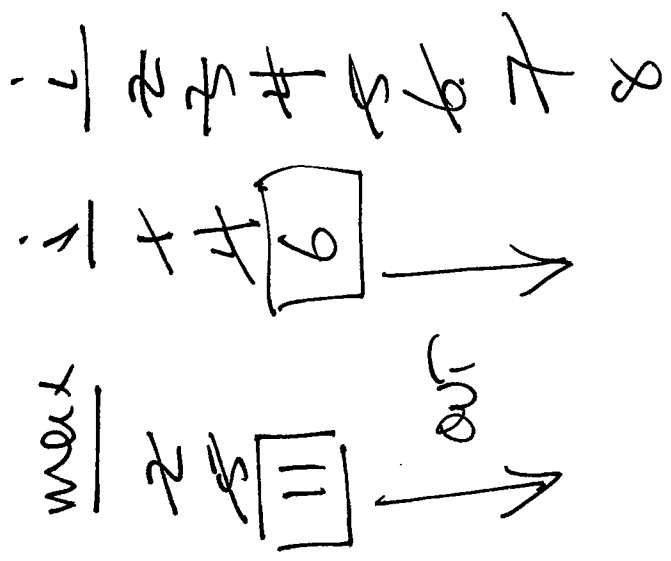
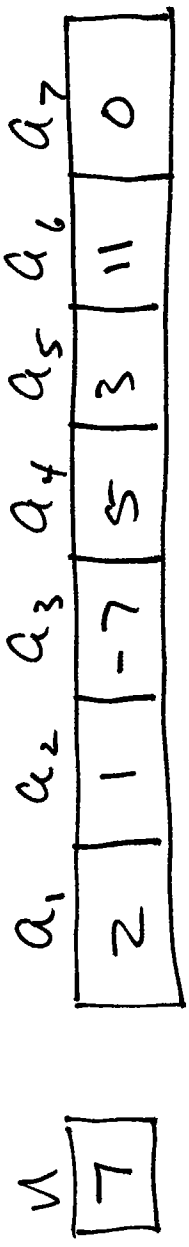
FIND LARGEST

- 1.) $max \leftarrow a_1$ (LARGEST VALUE SEEN SO FAR)
- 2.) $j \leftarrow 1$ (INDEX OF j)
- 3.) $i \leftarrow 2$ (INDEX OF ELEMENT WE ARE NOW LOOKING AT)
- 4.) while $i \leq n$
- 5.) if $a_i > max$
- 6.) $max \leftarrow a_i$
- 7.) $j \leftarrow i$
- 8.) $i \leftarrow i + 1$
- 9.) Print max, j
- 10.) stop

3

EXERCISE:

TRACE THIS ON : 2, 1, -7, 5, 3, 11, 0



SAME ALGORITHM WITH AN EQUIVALENT FOR LOOP:

- 1.) $max \leftarrow a_1$
- 2.) $j \leftarrow 1$
- 3.) for $i \leftarrow 2$ to n
- 4.) $\left[\begin{array}{l} \text{if } a_i > max \\ \text{5.) } \quad \quad \quad max \leftarrow a_i \\ \text{6.) } \quad \quad \quad j \leftarrow i \end{array} \right.$
- 7.) Print max, j
- 8.) stop

EXERCISE

SUPPOSE ADDITION (OF INTEGERS) IS A PRIMITIVE OPERATION, BUT MULT. IS NOT. WRITE AN ALGORITHM THAT MULTIPLIES TWO INTEGERS.

- 1.) get a, b (two #s to be multiplied)
- 2.) $Product \leftarrow 0$
- 3.) $i \leftarrow 1$
- 4.) while $i \leq b$
- 5.) $Product \leftarrow Product + a$
- 6.) $i \leftarrow i + 1$
- 7.) Print $Product$
- 8.) stop

PATTERN MATCHING

GIVEN n TEXT CHARACTERS

$T_1 T_2 T_3 \dots \dots \dots T_n$

AND GIVEN m PATTERN CHARACTERS

$P_1 P_2 \dots \dots P_m$

FIND EVERY OCCURRENCE OF PATTERN WITH TEXT

i.e. EVERY INDEX i AT WHICH PATTERN BEGINS.

