

## Group 5

**J symbol (i-dot):**      **i.**

### Monadic case:

Name: *integers*

Rank: 1 (vector) – applies to a vector  $y$

Definition (simple): **i.**  $y$  returns the *first  $y$  non-negative integers*. If  $y$  is *negative* then the *order* of the integers is *reversed*.

Definition (precise): **i.**  $y$  returns the first  $|y|$  non-negative integers. That is, the number of integers returned is the product of the magnitude of the elements of the vector  $y$ . For example,  $|2\ 3\ 4|$  is 24. The shape of the result is  $y$ . If the element  $i$  of  $y$  is negative, then the order of the elements aligned along the corresponding axis  $i$  of the result is reversed.

Please also include *explanations* for your answers to some of the following questions:

What is the result when  $y$  is a single positive, or negative number?

What is the result when  $y$  is zero?

What is the result when  $y$  is a vector of numbers?

### Dyadic case:

Name: *index of*

Rank:  $\_$  (left);  $\_$  (right) – applies to the entire array on the left and right side

Definition (simple): **x i.**  $y$  returns the *first occurrence* of  $y$  in  $x$ . If  $y$  does not appear in  $x$ , then the *number of items* in  $x$  is returned.

Definition (precise): **x i.**  $y$  returns the *first occurrences* of the *sub-arrays* of  $y$  in  $x$ , where the *shape* of the sub-arrays is defined by the shape of the *items* of  $x$ .

Please also include *explanations* for your answers to some of the following questions:

What is the index of number  $y$  in vector  $x$ ?

What is the index of character  $y$  in string  $x$ ?

What is the index of vector  $y$  in matrix  $x$ ?

What is the result when  $y$  is not in  $x$ ?

Why is the definition given in terms of the sub-arrays of  $y$ , not the items of  $y$ ?