Group 2

J symbol (left-brace-dot): **{.**

Monadic case:

Name: *head*
Rank: _ (infinite/unbounded) – applies to the entire array y
Definition (simple): **{. y** is the *first item* of y.
Definition (precise): **{. y** is **0{1{.y**. That is, the *head* of y is the *first item* of y, which is an *item* of *fill elements* if y has *no items*. The *fill element* is 0 for *numeric arrays*, *space* for *literal arrays*, and *empty box* for *box arrays*.

Please also include *explanations* for your answers to some of the following questions:
What is the head of a list?
What is the head of a matrix?
Why is/isn't the head of a scalar itself?
What is the head of an empty matrix (e.g., 0 4$100)?

Dyadic case:

Name: *take*
Rank: 1 (left); _ (right) – applies to a vector on the left and the entire array on the right
Definition (scalar x): **x {. y** returns x *items* from y. If x is *positive*, then items are taken from the *front* of y. If x is *negative*, then the items are taken from the *back* of y. If x is *greater* than the *number of items* in y, then the result is y *padded out* with items of *fill elements*. The *fill element* is 0 for *numeric arrays*, *space* for *literal arrays*, and *empty box* for *box arrays*.
Definition (vector x): **x {. y** returns an array constructed from the elements of y indexed by taking length xi of axis i of y, where xi is the i-th element of x. The axis is taken from the front if xi is positive, and from the back is xi is negative. If xi is infinity, then xi is the length of axis i of y. Fill elements are used if xi is greater than the length of axis i of y.

Please also include *explanations* for your answers to some of the following questions:
What array is returned when x is positive?
What array is returned when x is negative?
What array is returned when x is greater than the number of items in y?
What array is returned when x is zero?
What array is returned when x is a vector?
What array is returned when x is infinity?