Example 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | #map | The outer array | None | New array [1, 3] | No |
| 1-4 | Block execution | Each sub-array | None | Element at index 0 for each sub-array | Yes, used by #map on for transformation |
| 2 | #first | Each sub-array | None | Element at index 0 for each sub-array | Yes, used by #puts |
| 2 | #puts | Element at index 0 for each sub-array | Outputs an integer | Nil | No |
| 3 | #first | Each sub-array | None | Element at index 0 for each sub-array | Yes, used to determine the return value of the block |

Example 4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | Variable assignment | n/a | None | [[18, 7], [3, 12]] | no |
| 1 | #each | The outer array | None | Original object | Yes, by the variable assignment |
| 1-7 | Block execution | Each sub-array | None | Each sub-array | no |
| 2 | #each | Each element of the sub-array in that iteration of the outer block | None | Original object | Yes, used to determine the return value of the outer block |
| 2-6 | Block execution | Each element of the sub-array that is currently being iterated | None | Nil | no |
| 3 | ‘if’ conditional | Each element of the array | None | True or false (nil) | Yes, used to determine the return value of the inner block |
| 4 | #puts | Each element of the array that evaluates to true | Outputs an integer (a string) | nil | Yes, used to determine the return value of the inner block |

Example 5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | #map (outer) | [[1, 2], [3, 4]] | None | New array [[2, 4], [6, 8]] | No |
| 1-5 | Outer block execution | [1, 2] & [3, 4] | None | Element at index 0 for each sub-array | Yes, used by #map (outer) for transformation |
| 2 | #map (inner) | [1, 2] & [3, 4] | None | New arrays [2, 4] & [6, 8] | Yes, used to determine value of outer block |
| 2-4 | Inner block execution | Elements of each sub-array iterated over (1, 2, 3, 4) | None | Elements of sub-array multiplied by 2 (2, 4, 6, 8) | Yes, used to determine elements of new array returned by #map (inner) |
| 3 | #\* 2 | n/a | none | 2, 4, 6, 8 | Yes, used to determine the return value of inner block |

Example 6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | #select | The array | None | [{:c => cat}] | No |
| 1-5 | Outer block execution | Each hash in the array | None | False, true | Yes, used by #select for selection in returned array |
| 2 | #all? | Each sub-array | None | False, true | Yes, used to determine value of the outer block |
| 2-4 | Inner block execution | Every key and value of each hash | None | False, false, true | Yes, used to determine value of #all? |
| 3 | #[0] | Each iterated value | None | String value at index 0 in each string | Yes, used to determine the return value of the inner block |
| 3 | == | Value[0] | None | False, false, true | ^ |
| 3 | #to\_s | Each iterated key | None | Key value as a string | ^ |

Example 9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | #map | [[[1], [2], [3], [4]], [[“a”], [“b”], [“c”]]] | None | [[[1], [2], [3], [4]], [[“a”], [“b”], [“c”]]] (new, not original obj) | No |
| 1-7 | 1st tier block execution | [[1], [2], [3], [4]] & [[“a”], [“b”], [“c”]] | None | [[1], [2], [3], [4]] & [[“a”], [“b”], [“c”]] | Yes, used by #map to determine returned array |
| 2 | #each | [[1], [2], [3], [4]] & [[“a”], [“b”], [“c”]] | None | [[1], [2], [3], [4]] & [[“a”], [“b”], [“c”]] | Yes, used to determine value of the 1st tier block |
| 2-6 | 2nd tier block execution | [1], [2], [3], [4], [“a”], [“b”] [“c”] | None | False, false, true | Yes, used to determine value of #all? |
| 3 | #partition | 1, 2, 3, 4, “a”, “b”, “c” | None | [1, 2, 3, 4, “a”, “b”, “c”] | Yes, used to determine the return value of the 2nd tier block |
| 3 | == | Value[0] | None | False, false, true | ^ |
| 3 | #to\_s | Each iterated key | None | Key value as a string | ^ |

Example 10

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Line | Action | Object | Side Effect | Return Value | Is Return Value Used? |
| 1 | #map | [[[1, 2], [3, 4]], [5, 6]] | None | [[[2, 3], [4, 5]], [6, 7]] | No |
| 1-11 | 1st tier block execution | [[1, 2], [3, 4]], [5, 6] | None | [[1, 2], [3, 4]], [6, 7] | Yes, used by #map for transformation |
| 2 | #map | [1, 2], [3, 4], 5, 6 | None | [[1, 2], [3, 4]], [6, 7] | Yes, used to determine the return value of the 1st tier block |
| 2-10 | 2nd tier block execution | [1, 2], [3, 4], 5, 6 | None | [2, 3], [4, 5], 6, 7 | Yes, used by #map for transformation |
| 3 | ‘if’ conditional | [1, 2], [3, 4], 5, 6 | None | 6, 7 | Yes, used to determine the return value of the 2nd tier block |
| 3 | #to\_s | [1, 2], [3, 4], 5, 6 | None | “[1, 2]”, “[3, 4]”, “5”, “6” | Yes, used by #size |
| 3 | #size | “[1, 2]”, “[3, 4]”, “5”, “6” | None | 6, 6, 1, 1 | Yes, used in “==” evaluation |
| 3 | == | 6, 6, 1, 1 | None | False, false, true, true | Yes, used to determine value of if conditional |
| 4 | #+ | 5, 6 | None | 6, 7 | ^ |
| 5 | ‘else’ conditional | [1, 2], [3, 4] | None | [2, 3] [4, 5] | Yes, used to determine the return value of the 2nd tier block |
| 6 | #map | 1, 2, 3, 4 | None | [2, 3], [4, 5] | Yes, used to determine value of else conditional |
| 6-8 | 3rd tier block execution | 1, 2, 3, 4 | None | 2, 3, 4, 5 | Yes, used to determine values used for transformation by #map |
| 7 | #+ | 1, 2, 3, 4 | None | 2, 3, 4, 5 | Yes, used to determine value of 3rd tier block execution |