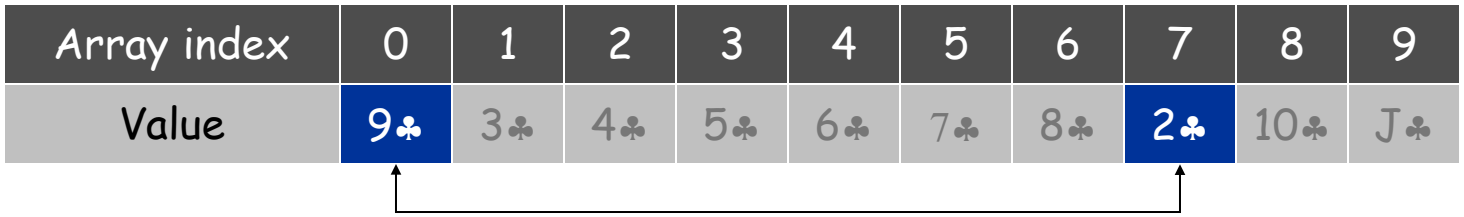
Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i



random integer = 7

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

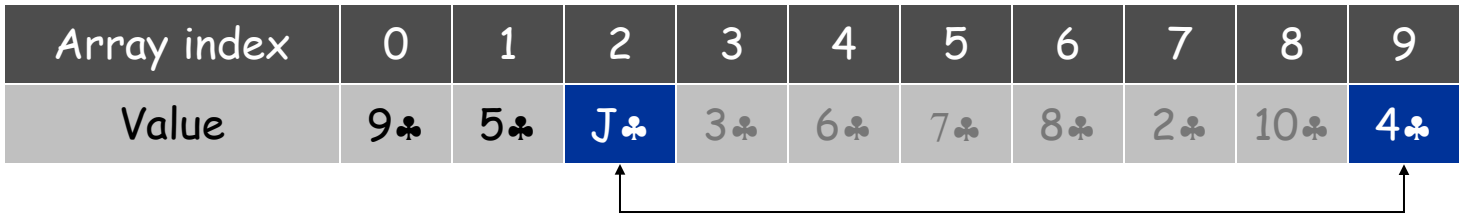
Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	4♣	3♣	6♣	7♣	8♣	2♣	10♣	J♣

random integer = 3

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

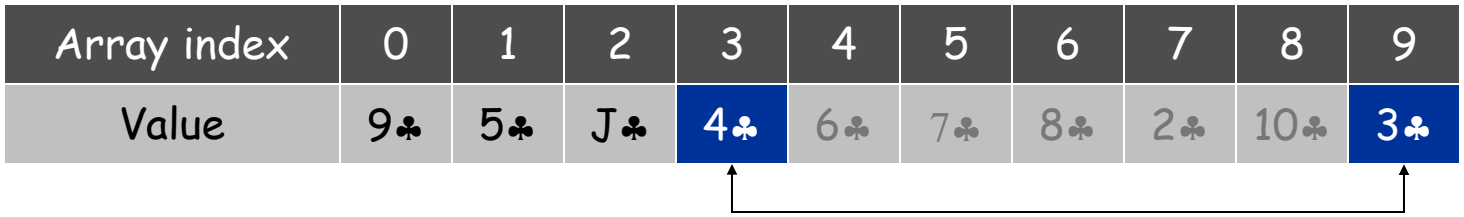


random integer = 9

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i



Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	6♣	7♣	8♣	2♣	10♣	3♣

random integer = 9

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	7♣	6♣	2♣	10♣	3♣

random integer = 6

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	6♣	2♣	10♣	7♣

random integer = 9

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	10♣	2♣	6♣	7♣

random integer = 8

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	10♣	7♣	6♣	2♣

random integer = 9

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	10♣	7♣	6♣	2♣

random integer = 8

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	10♣	7♣	6♣	2♣

random integer = 9

Shuffle an Array

Shuffle a deck of cards

- In i^{th} iteration, choose a random element from remainder of deck and put at index i
  - choose random integer r between i and N-1
  - swap values in positions r and i

Array index	0	1	2	3	4	5	6	7	8	9
Value	9♣	5♣	J♣	4♣	8♣	3♣	10♣	7♣	6♣	2♣