

ad-6. スタック

(C 言語によるアルゴリズムとデータ構造) (全 6 回)

URL: <https://www.kkaneko.jp/pro/ad/index.html>

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アウトライン



6-1 スタック、プッシュとポップ

パソコン演習



- ① ウェブブラウザを起動する
- ② 次の URL を開く

<https://www.cs.usfca.edu/~galles/visualization/Algorithms.html>

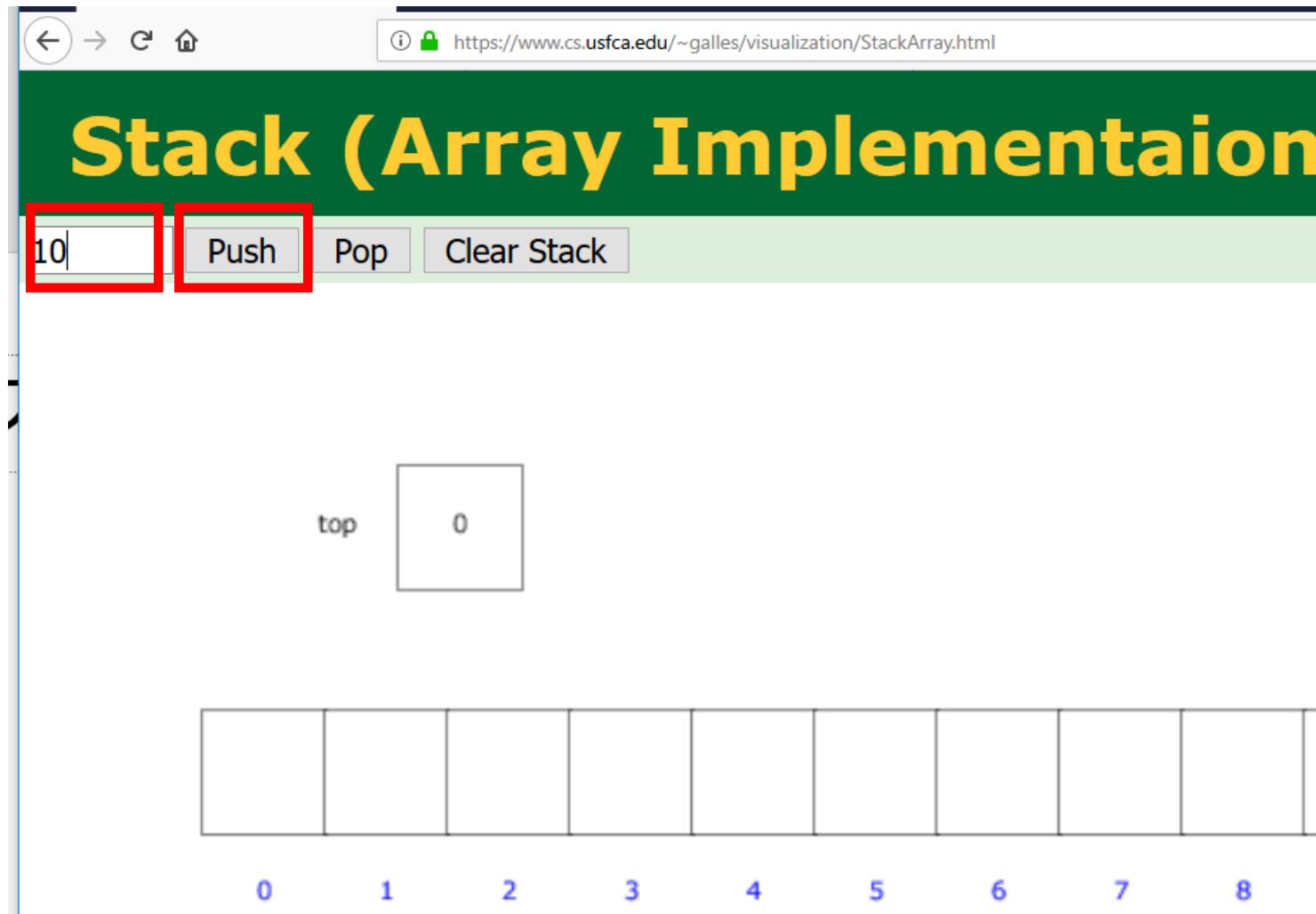
米国サンフランシスコ大の中のサイト

③ 「Stack: Array Implementation」をクリック

Currently, we have visualizations for the following

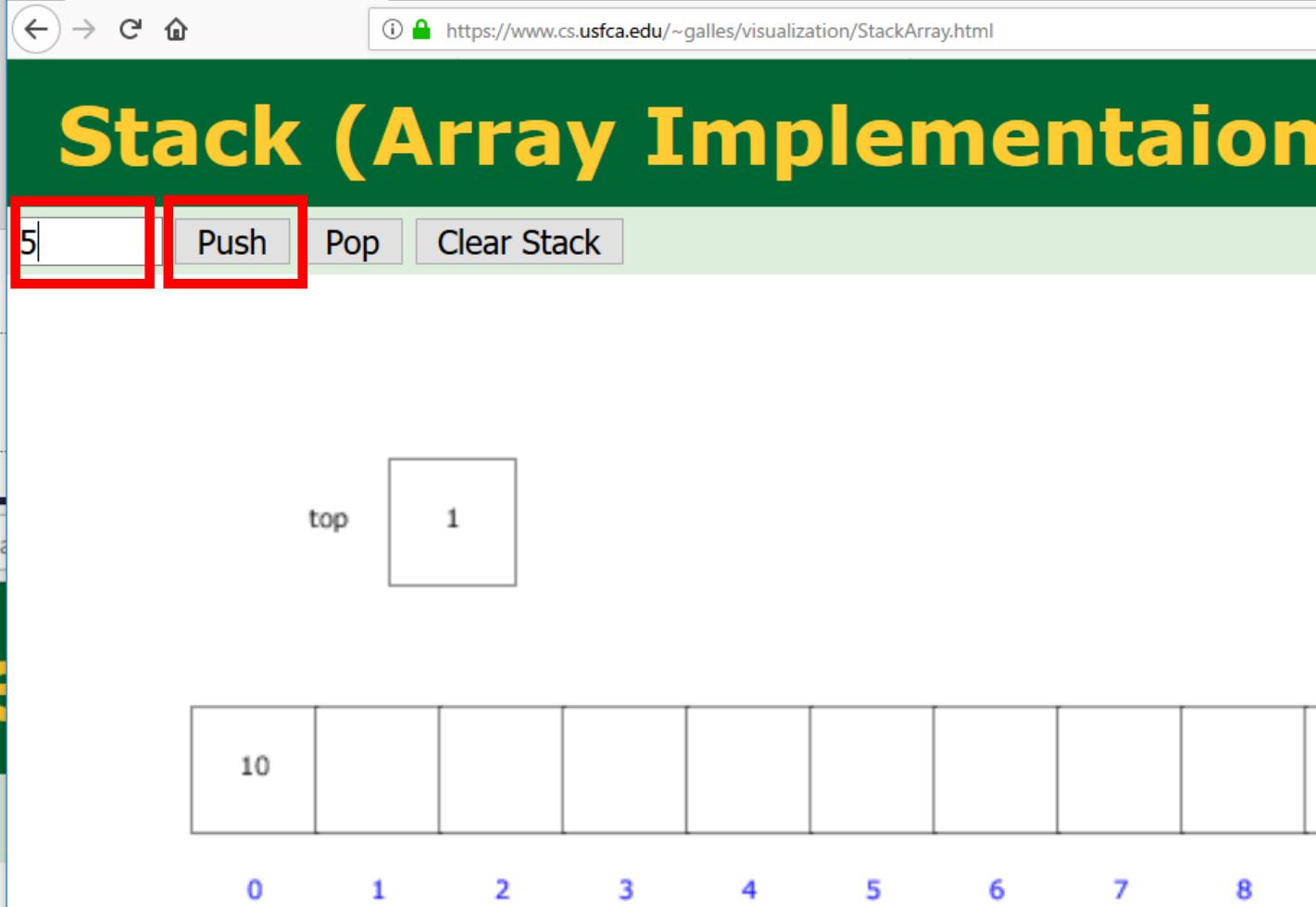
- Basics
 - Stack: Array Implementation
 - Stack: Linked List Implementation
 - Queues: Array Implementation
 - Queues: Linked List Implementation
 - Lists: Array Implementation (available)
 - Lists: Linked List Implementation (available)
- Recursion
 - Factorial
 - Reversing a String
 - N-Queens Problem

- ④ 試しに「10」を入れ、「Push」クリック



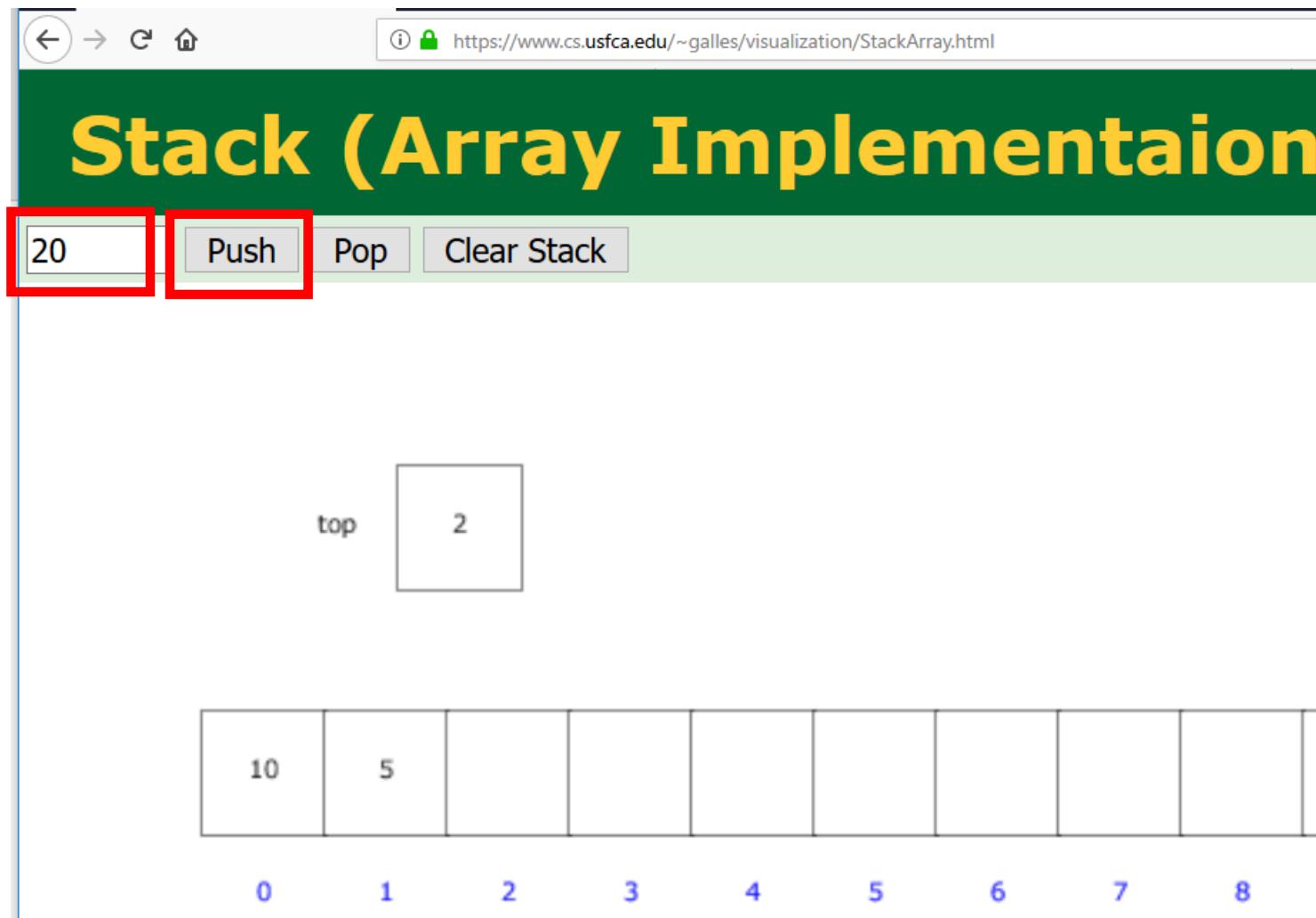
The screenshot shows a web-based visualization for stack array implementation. At the top, there's a browser header with back, forward, and search buttons, and a URL bar showing <https://www.cs.usfca.edu/~galles/visualization/StackArray.html>. Below the header is a green banner with the title "Stack (Array Implementation)" in yellow. Underneath the banner is a control panel with four buttons: "10" (with a red box around it), "Push" (with a red box around it), "Pop", and "Clear Stack". The main area displays a stack structure. A pointer labeled "top" points to a square containing the number "0". Below the stack is a horizontal array of nine empty boxes, indexed from 0 to 8 at the bottom. The index "0" is highlighted in blue.

⑤ 次に「5」を入れ、「Push」クリック

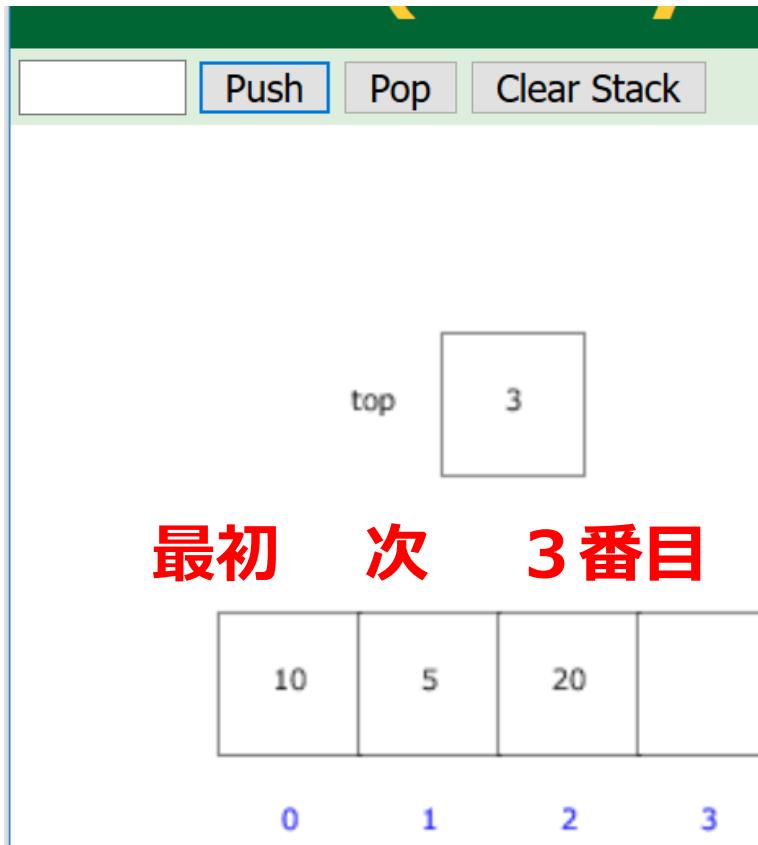


The screenshot shows a web-based visualization for stack array implementation. At the top, there's a navigation bar with icons for back, forward, search, and home, followed by a URL bar showing <https://www.cs.usfca.edu/~galles/visualization/StackArray.html>. Below the URL is a large yellow header with the text "Stack (Array Implementation)". Underneath the header is a control panel with four buttons: a text input field containing "5", a "Push" button, a "Pop" button, and a "Clear Stack" button. The "5" and "Push" buttons are highlighted with red boxes. Below the control panel, the word "top" is positioned above a small square box containing the number "1". At the bottom, there's a horizontal array of ten cells. The first cell contains the number "10", and the index below it is "0". The indices from 1 to 9 are shown in blue. The array cells are empty for indices 1 through 9.

⑥ 次に「20」を入れ、「Push」クリック



The screenshot shows a web-based visualization for stack array implementation. At the top, there's a browser header with back, forward, and search buttons, and a URL bar showing <https://www.cs.usfca.edu/~galles/visualization/StackArray.html>. Below the header, a large yellow title reads "Stack (Array Implementation)". Underneath the title is a control panel with four buttons: "20" (with a red border), "Push" (highlighted with a red border), "Pop", and "Clear Stack". The main area displays a stack structure with a pointer labeled "top" pointing to a box containing the number "2". Below this, a horizontal array has cells containing "10" and "5" at indices 0 and 1 respectively, with the rest of the array being empty. Indexes from 0 to 8 are labeled below the array.



3つのデータ
10, 5, 20 が格納された

最初 次 3番目

※ スタックは
複数のデータを格納できる
データ構造

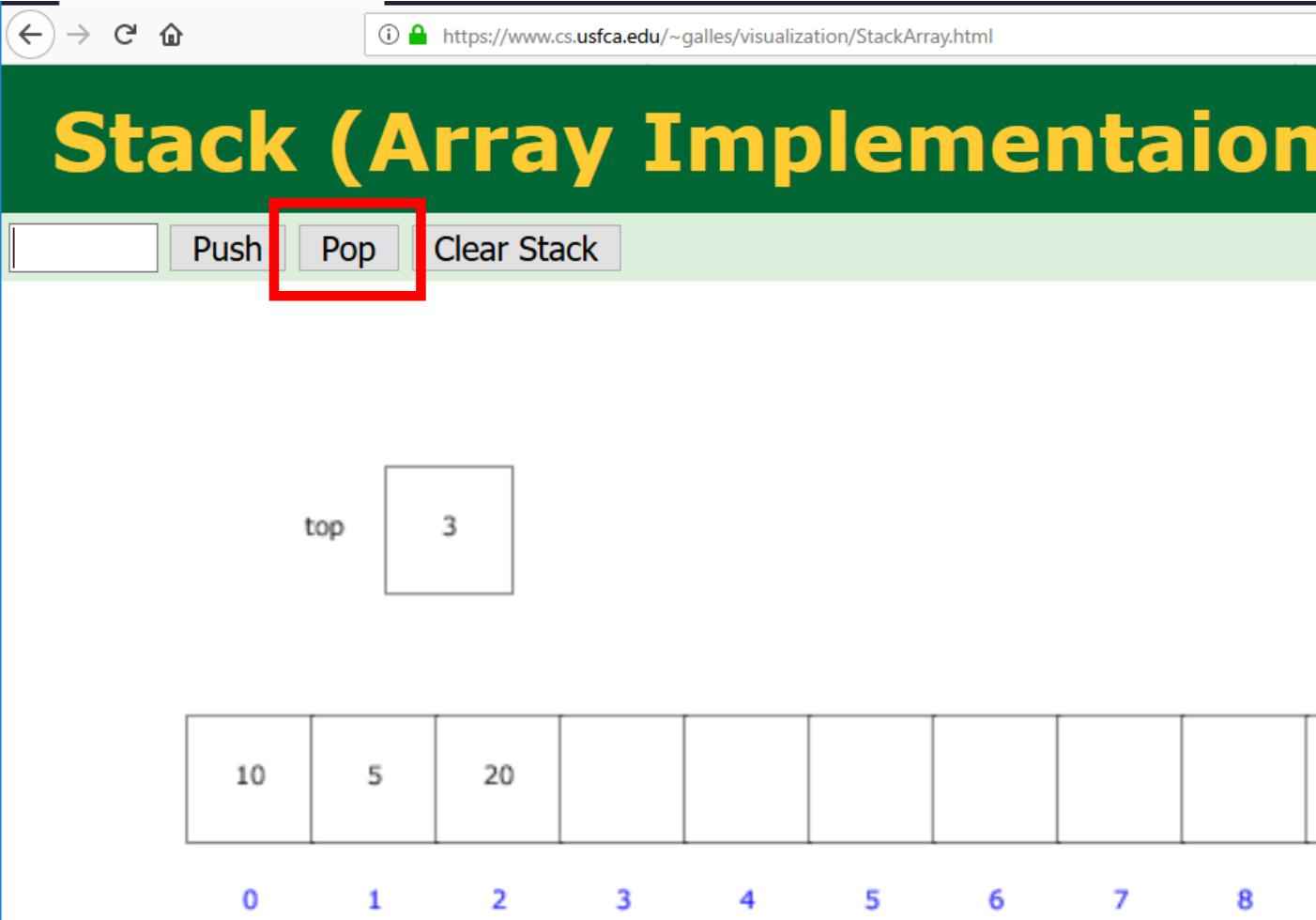
⑦ 今度は「Pop」をクリック. 「20」が出てくる

Stack (Array Implementation)

Push Pop Clear Stack

top 3

10	5	20						
0	1	2	3	4	5	6	7	8





⑧ 「Pop」をクリック。「5」が出てくる

Stack (Array Implementation)

Push Pop Clear Stack

Popped Value: 20

top  2

10	5							
0	1	2	3	4	5	6	7	8

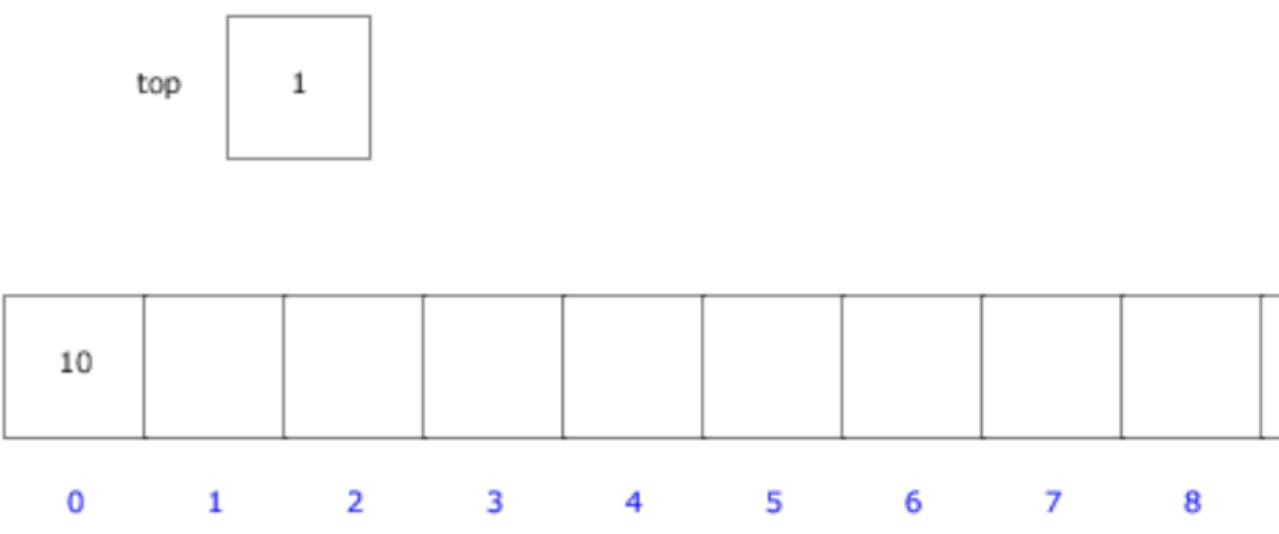
- ⑨ 「Pop」をクリック. 「10」が出てくる

Stack (Array Implementation)

Push Pop Clear Stack

Popped Value: 5

top

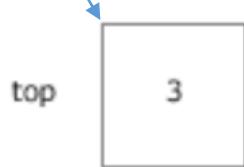


10									
0	1	2	3	4	5	6	7	8	9

スタックのpushとpop



次にpushできる
場所を示している



・push :

stackの一番上に追加

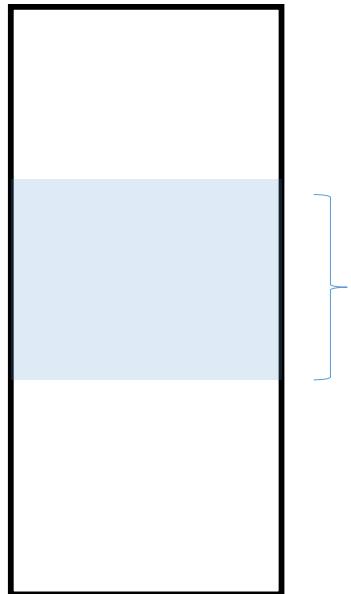
・pop :

stackの一番上から削除

スタックの構成



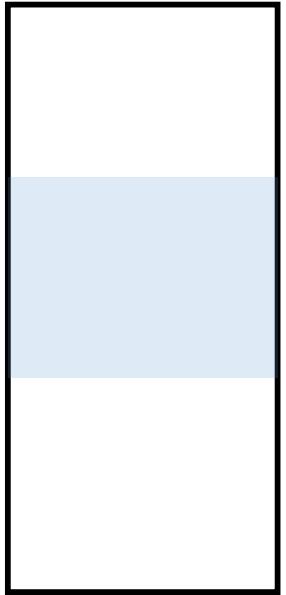
配列を使用する場合



メモリ

事前に、メモリ内に
配列を確保

スタックの構成



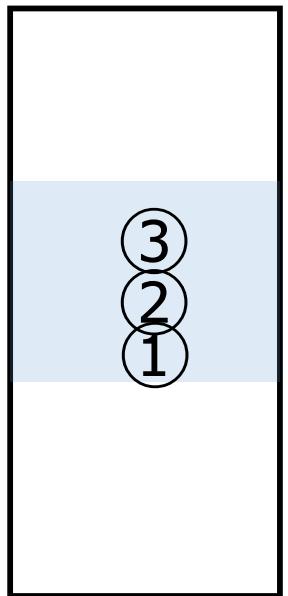
最初は空

メモリ

スタックの構成



①、②、③の順で
プッシュすると



メモリ

一番最後にpush
した③が一番上

データが入っていく