Stacks

(Algorithms and Data Structures)

Stacks

- it is an **abstract data type** – and it can be implemented either with **arrays** or with **linked lists**
- it has a so-called **LIFO** structure – the last item we inserted is the first item we take out
- basic operations are**pop()**, **push()** and **peek()**
- most of the modern programming languages are **stack-oriented**
- they define most basic operations (adding two numbers) as taking their **arguments from the stack** and placing any return values back on the stack

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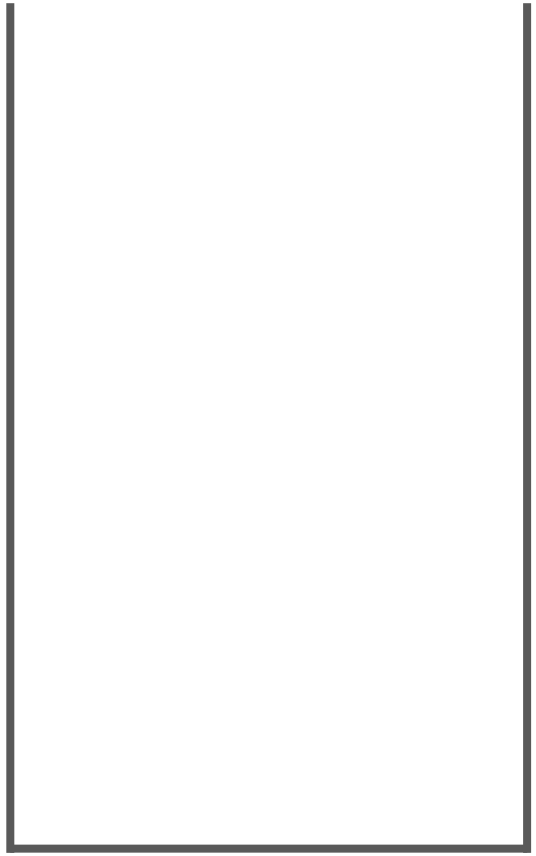

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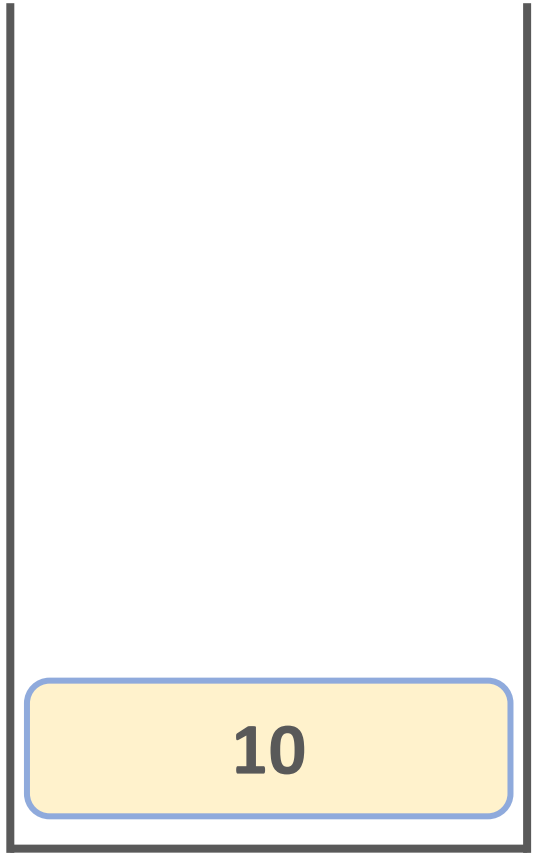

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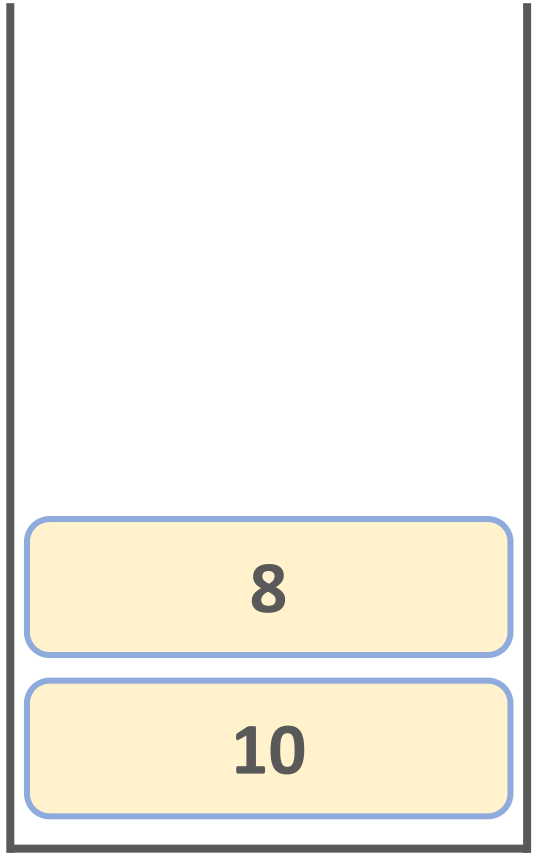

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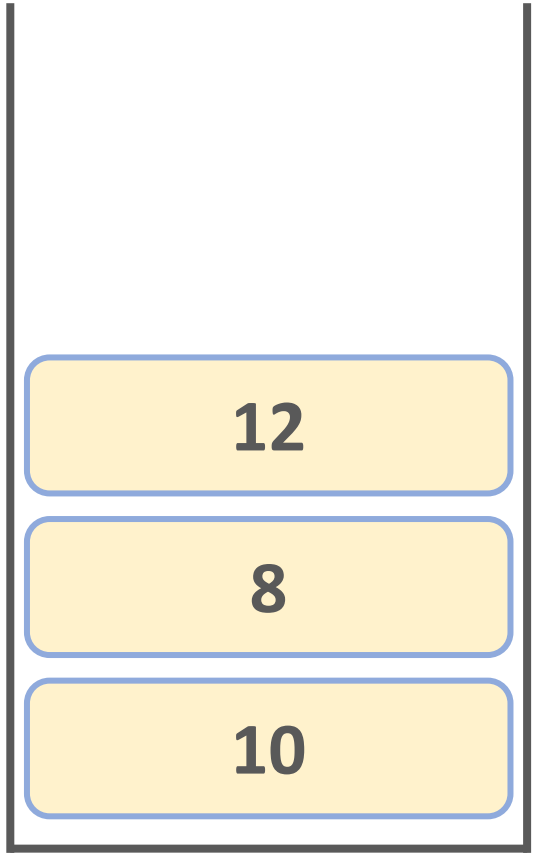

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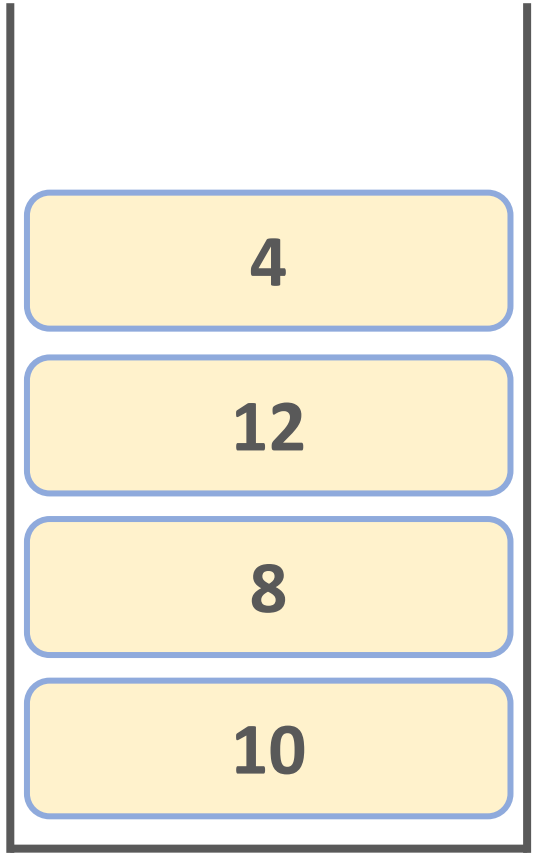

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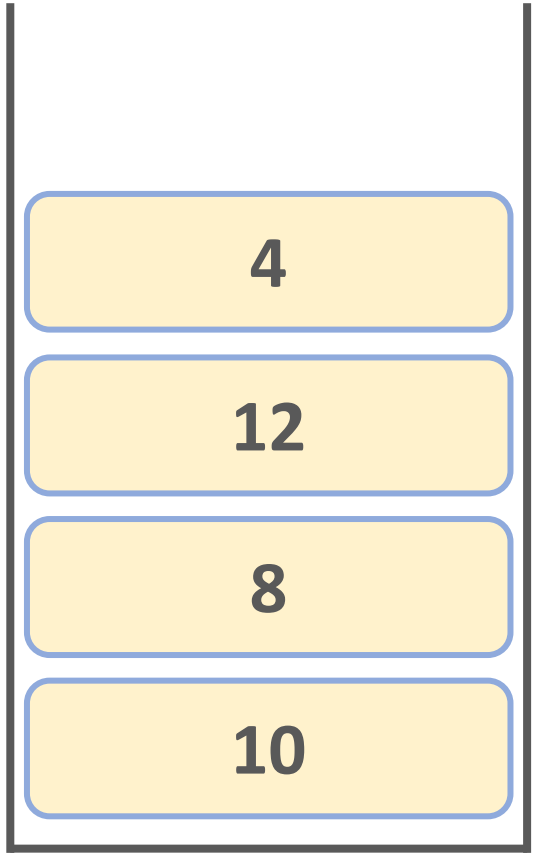

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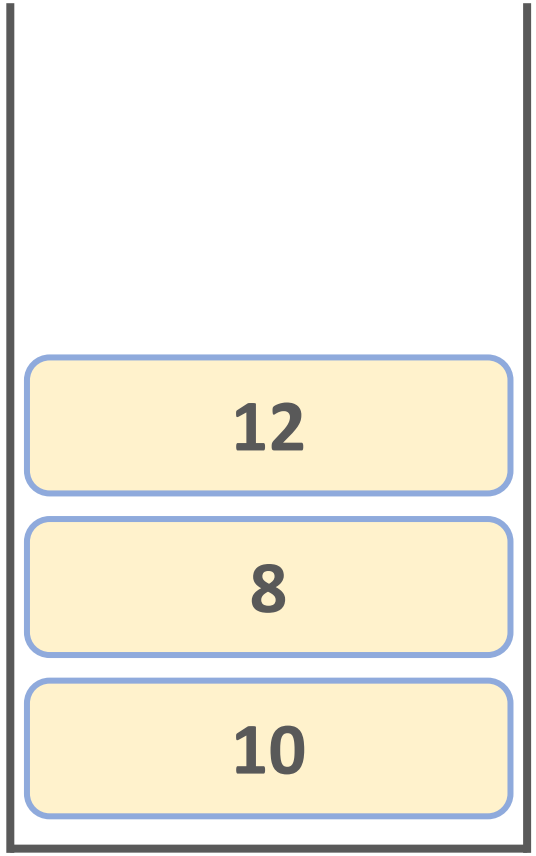

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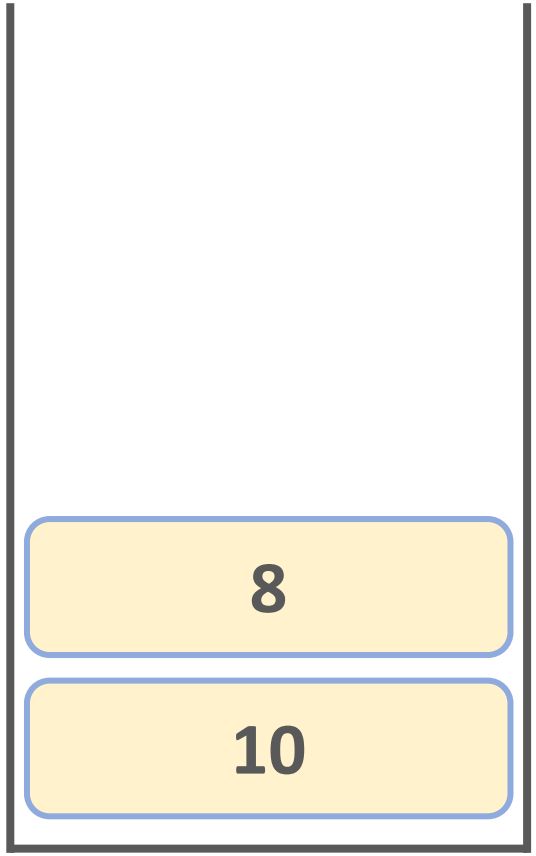

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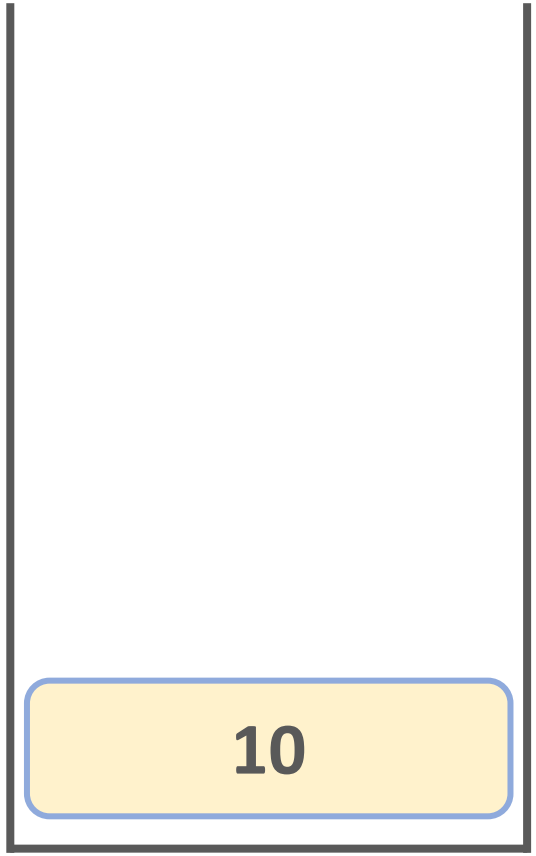

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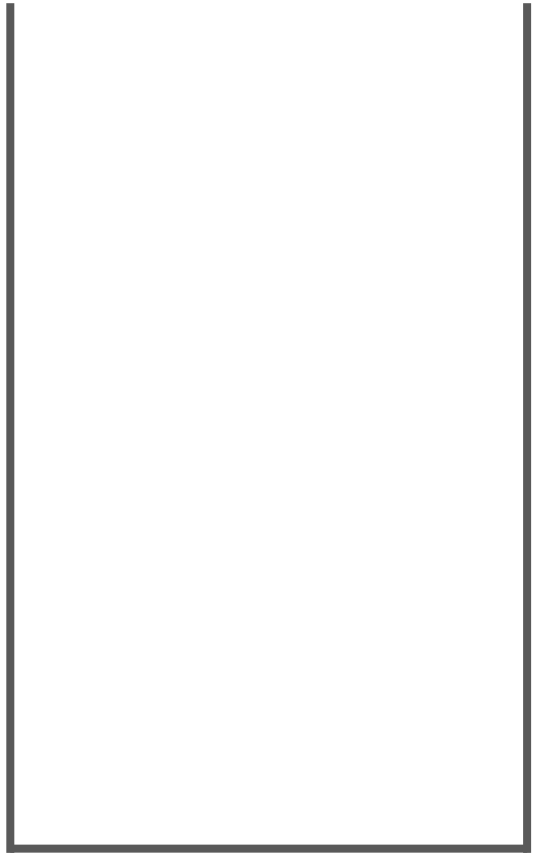

Stacks Applications

- in **stack-oriented** programming languages
- graph algorithms rely heavily on stacks such as depth-first search can be implemented with stacks
- finding Eulerian cycles in a **G(V,E)** graph
- finding **strongly connected components** in a given **G(V,E)** graph