

Comparison between the array-based and the linked implementation: “Which is **always** better?” is a wrong question!

Array-based implementation

Linked implementation

```
typedef struct stack{  
    int top;  
    StackEntry entry[MAXSTACK];  
} Stack;
```

```
typedef struct stacknode{  
    StackEntry entry;  
    struct stacknode *next;  
} StackNode;
```

```
typedef struct stack{  
    StackNode *top;  
    int size;  
} Stack;
```

-All the space is reserved even the stack is empty (wasting memory)

-Stack gets full even if the memory is not!

-Extra field `next` for every new node.

-The stack size is as large as the memory you have!

Comparison between the array-based and the linked implementation: “Which is **always** better?” is a wrong question!

	Array-based implementation	Linked implementation
Pop	$\Theta(1)$	$\Theta(1)$
Push	$\Theta(1)$	$\Theta(1)$
<u>CreateStack</u>	$\Theta(1)$	$\Theta(1)$
<u>StackSize</u>	$\Theta(1)$	$\Theta(1)$
<u>TraverseSack</u>	$\Theta(N)$	$\Theta(N)$
<u>ClearStack</u>	$\Theta(1)$	$\Theta(N)$

Then, there are advantages and disadvantages for every implementation. Which one is better **really** depends on the application. E.g.,

If ClearStack is extensively used then, maybe array-based implementation is better.

If the memory is very limited, then maybe the linked implementation is better.

The rule is: **Know very well the pros and cons of each implementation and decide based on your application needs.**