HW5

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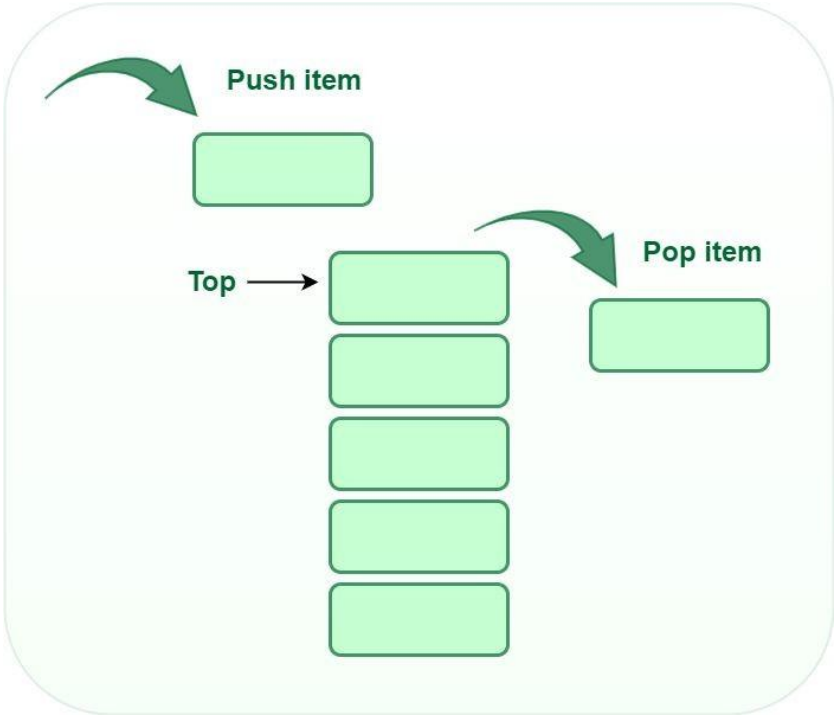
HW5

Matching/Analyzing HTML Tags.

- Check whether a given (simplified) HTML web page is valid
  - By HTML Tag Matching (TB, page. 212-213)
- Output:
  - all the matched tags if the html is valid
  - The first mis-matched tag if the html is invalid
- Assume all matched tags are in the form:
  - <name>…</name>

Stack feature

- LIFO(Last In First Out)
- Use POP to remove top data
- Use PEEK to get top data (without remove it)
- Use PUSH to add data to the top



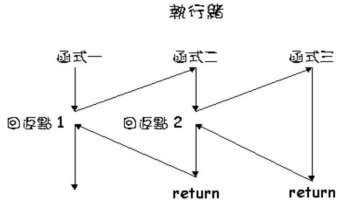
From https://www.geeksforgeeks.org/introduction-to-stack-data-structure-and-algorithm-tutorials/

Scenes

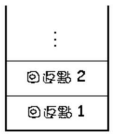
- Make Function Call
- Palindrome
- Valid Parentheses

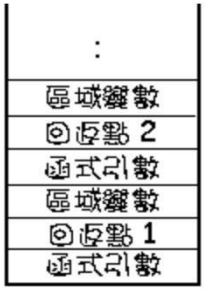
Make Function Call

- When a **recursive function** is invoked, its parameters are stored in a data structure called activation records. These activation records are **stored in a special stack** called the recursive stack. These activation records are deleted when the function execution is completed.



這些回返點每個執行緒會將之記錄在一個堆疊上，如下圖：

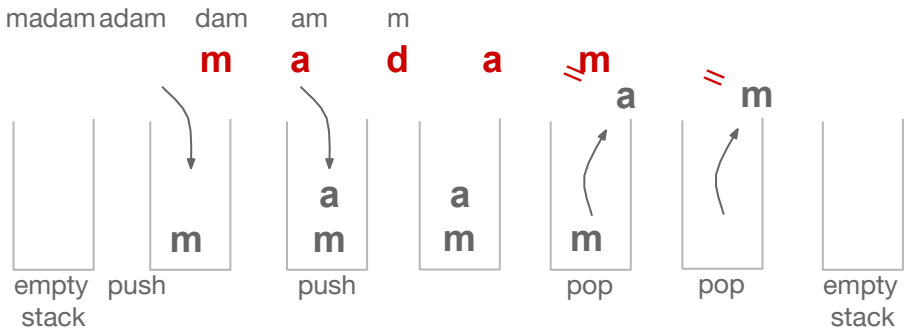




From https://www.geeksforgeeks.org/what-is-the-recursive-stack-size/

Palindrome

- **Push** the **first half of the text** into the stack in sequence, and then **pop** out the **second half of the text** one by one to check if they are the same, and finally the stack must be empty.
- Taking **madam** as an example, the first half of the ma is placed in the stack in order (stack = am]), then because d is in the middle and ignore, character a pops out and found that a == a, (stack = m]), so continue to the next character m, found that m == m, finished and the stack is empty, so it is a Palindrome.



Valid Parentheses

- Verify that the parentheses in the string are paired legally.

  "**([])**", "**{()}**", "**[]**" are legal pairs, "**(]**", "**([)]**" are illegal pairs.
- If there is a left parenthesis, there must be a right parenthesis (the number of parentheses must be even), and **the appearance order of the left parenthesis will be opposite to that of the right parenthesis**.
- The left parenthesis appears first, and the paired right parenthesis will appear last.
  Use the first in last out feature of Stack.

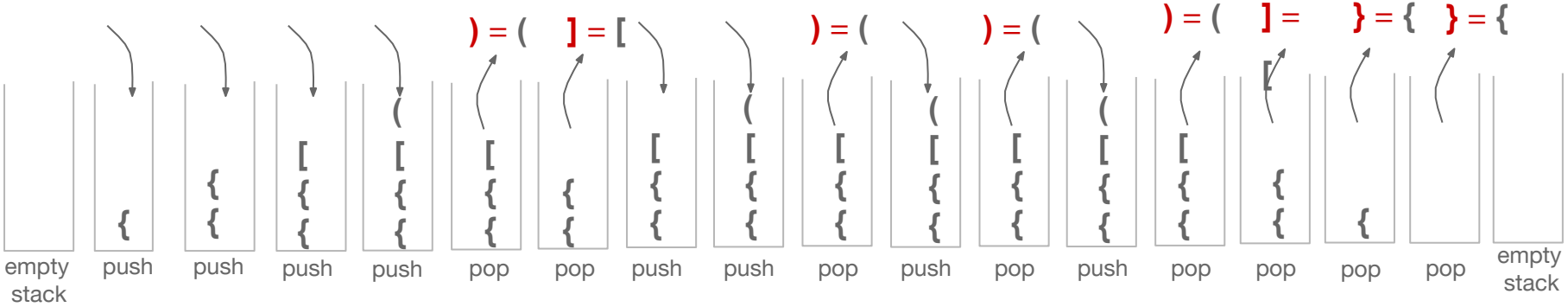
Valid Parentheses

- If there is a **left** series of parentheses, **push** the left parenthesis into the Stack.

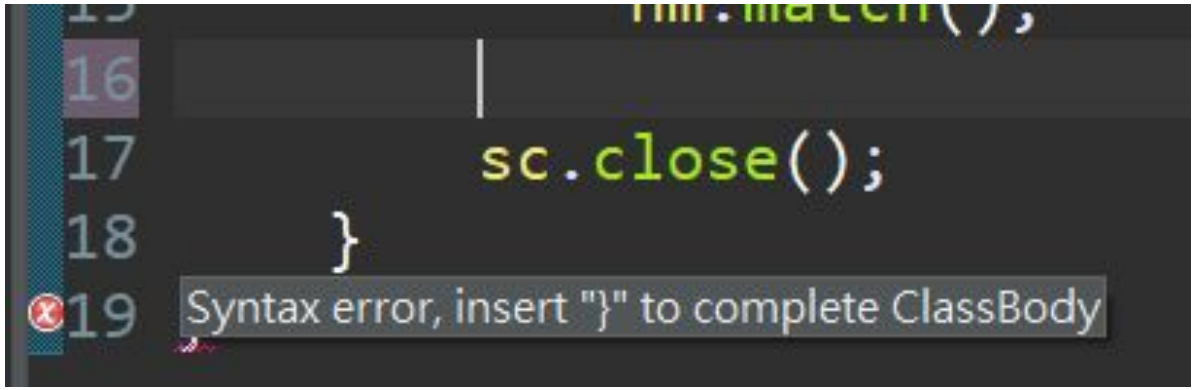
  If there is a **right** series of parenthesis, **pop** a parenthesis from the Stack and compare whether it is the same series.

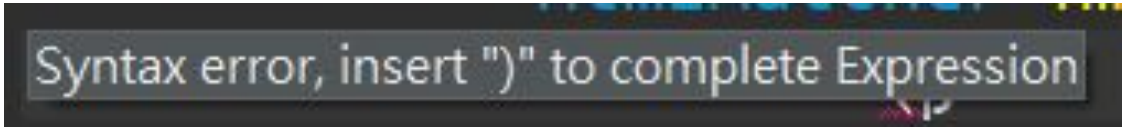
  Finally, check there is a lonely left parenthesis in the Stack. If not, the pairing is successful, and if there is, the pairing fails.

  Ex: { { [(3+5) * 2] + [(6-3)*(5+8)/(6+9+1)] } / 2 }



Valid Parentheses





Some Syntax

-

  There is no space in <>, the open and close tags are separated

- <style type=“text/css”>

  There has space in the open tag

- <meta ~~~~/>

  Skipped directly, because the format is inconsistent, and there are no separate open and close tag

- <!doctype ~~~~~>

  Skipped directly, usually it is a comment or !doctype

ps : ~~~~ is ellipsis

I/O Example

- To do: Check all the tags in the page is correct (matched) or not.
- Input:
  - Ex: http://www.example.com
- Output:
  - Correct

    True
  - Incorrect (print a “False” and then print your stack in one line. Top element should be the first doesn’t match one)

    False div span a

Example

input ➔
```
http://www.example.com
```
output ➔
```
True
```

input ➔
```
http://soslab.nccu.edu.tw/Welcome.html
```
output ➔
```
False ?xml html head link !--[if link ![endif]-- !--[if link ![endif]-- style !--
        @import
```