# Data Structure Project

## Browser History Manager
## with Doubly Linked List and Stack

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# Overview

The primary objective of this project is to simulate a browser history manager that provides functionality to navigate between web pages using **Back**, **Forward**, and **Jump-to** actions.

# Tools

- **Doubly Linked List :** used to represent the browser's history of visited pages , Each node in the list represents a webpage, with pointers to the previous and next pages for seamless backward and forward navigation.

- **Stack** : Used to Track Back and Forward , We have 2 stackes the first to back and another to forword

# ♣ Implementation

## In the first we have Node Class

To represents a webpage in the browser history (doubly linked) :

```java
static class Node {

    String url;
    Node prev, next;

    public Node(String url) {
        this.url = url;
        this.prev = null;
        this.next = null;
    }
}
```

## BrowserHistory Class

To manages browser history using a doubly linked list

### Constructor

```java
public BrowserHistory(String homepage) {
        head = new Node(homepage);
        current = head;
    }
```

# ♣ Methods

## BrowserHistory() Method

To adds a new page to the browser history.

```java
public void visit(String url) {
        Node newNode = new Node(url);
        current.next = newNode;
        newNode.prev = current;
        current = newNode;
        System.out.println("Visited: " + url);
    }
```

## back(int steps) Method

To move the current pointer back by steps

```java
    public String back(int steps) {
    while (steps > 0 && current.prev != null) {
        current = current.prev;
        steps--;
    }
    System.out.println("Back to: " + current.url);
    return current.url;
    }
```

## forward(int steps) Method

To move the current pointer forward by steps

```java
    public String forward(int steps) {
        while (steps > 0 && current.next != null) {
            current = current.next;
            steps--;
        }
        System.out.println("Forward to: " + current.url);
        return current.url;
    }
```

## getCurrentPage() Method

To Returns the URL of the current page.

```java
    public String getCurrentPage() {
        return current.url;
    }
```

# displayHistory() Method

To make loop in doubly linked list starting from head , and Displays all URLs that visited befor ,and marking the current page.

```java
public void displayHistory() {
    Node temp = head;
    int index = 1;
    System.out.println("Browsing History:");
    while (temp != null) {
        if (temp == current) {
            System.out.println(index + ". " + temp.url + " (current)");
        } else {
            System.out.println(index + ". " + temp.url);
        }
        temp = temp.next;
        index++;
    }
}
```

## ✚ Result

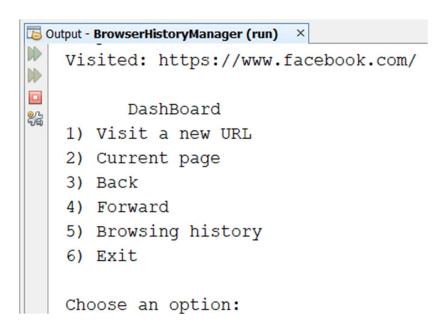When we run the program

```
Output - BrowserHistoryManager (run)    ×

run:
Enter First URL:
https://www.google.com/
```

It request to Enter First URL , I entered https://www.google.com/

```
Output - BrowserHistoryManager (run)    ×

            DashBoard
1) Visit a new URL
2) Current page
3) Back
4) Forward
5) Browsing history
6) Exit
```

I will choose 1 to visit a new page https://www.facebook.com/

```
Output - BrowserHistoryManager (run)    ×
   Visited: https://www.facebook.com/


           DashBoard
   1) Visit a new URL
   2) Current page
   3) Back
   4) Forward
   5) Browsing history
   6) Exit

   Choose an option:
```
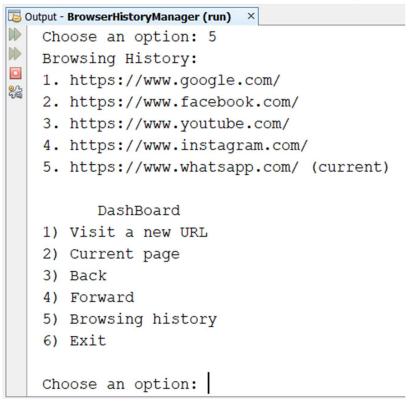
 I will enter 1 to visit new pages to test on it as
(https://www.youtube.com/
https://www.instagram.com/
https://www.whatsapp.com/)


after visiting 5 pages we will choose 5 to show **Browsing history**

```
Output - BrowserHistoryManager (run)    ×
   Choose an option: 5
   Browsing History:
   1. https://www.google.com/
   2. https://www.facebook.com/
   3. https://www.youtube.com/
   4. https://www.instagram.com/
   5. https://www.whatsapp.com/ (current)


           DashBoard
   1) Visit a new URL
   2) Current page
   3) Back
   4) Forward
   5) Browsing history
   6) Exit

   Choose an option: |
```

Now the current page is whatsapp we will chose 3 and enter number of steps (3) to **Back** to facebook

```
Output - BrowserHistoryManager (run) #5    ×
   Enter number of steps to go back:
   3
   Back to: https://www.facebook.com/
```

after Back 3 steps we will choose 5 to show **Browsing history**

```
Output - BrowserHistoryManager (run) #5    ×
   Browsing History:
   1. https://www.google.com/
   2. https://www.facebook.com/ (current)
   3. https://www.youtube.com/
   4. https://www.instagram.com/
   5. https://www.whatsapp.com/
```
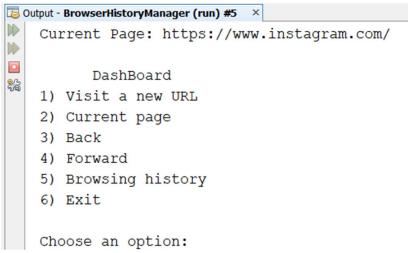
We can also **Forward** by steps (ex: forward 2 steps to go to instagram )

```
Output - BrowserHistoryManager (run) #5    ×
   Enter number of steps to go forward:
   2
   Forward to: https://www.instagram.com/
```

To show **Current page** choose 2

```
Output - BrowserHistoryManager (run) #5    ×
   Current Page: https://www.instagram.com/

        DashBoard
   1) Visit a new URL
   2) Current page
   3) Back
   4) Forward
   5) Browsing history
   6) Exit

   Choose an option:
```

At the end we can choose 6 to **Exit**

# Source - Code

**For Source Code Click :**
https://github.com/AhmedHamed408/Browser-History-Manager.git

**Or Scan**