CHANAKYA UNIVERSITY

Report on Browser Tab Navigation System - C Programming Project

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Problem Statement

Design and simulate a browser tab navigation system using C programming, based on the concepts of data structures. For each page of the browser, store a unique pageID (integer) and URL (string).

Functionalities to implement:

1. Visit a new page
2. Go back
3. Go forward
4. Show current tab
5. Close current tab
6. Show history
7. Exit

CODE

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
typedef struct Tab {
   int pageID;
   char url[100];
   struct Tab* prev;
   struct Tab* next;
} Tab;

Tab* head = NULL;
Tab* current = NULL;
int pageCounter = 1;
Tab* createTab(const char* url) {
   Tab* newTab = (Tab*)malloc(sizeof(Tab));
   newTab->pageID = pageCounter++;
   strcpy(newTab->url, url);
   newTab->prev = NULL;
   newTab->next = NULL;
   return newTab;
}
void visitNewPage() {
   char url[100];
   printf("Enter URL: ");
   scanf("%s", url);

   Tab* newTab = createTab(url);
```

```
    if (head == NULL) {
        head = newTab;
        current = newTab;
    } else {
        current->next = newTab;
        newTab->prev = current;
        current = newTab;
    }
    printf("Opened new tab: [%d] %s\n", current->pageID, current->url);
}
void goForward() {
    if (current != NULL && current->next != NULL) {
        current = current->next;
        printf("Switched to next tab: [%d] %s\n", current->pageID, current->url);
    } else {
        printf("No next tab available.\n");
    }
}
void goBack() {
    if (current != NULL && current->prev != NULL) {
        current = current->prev;
        printf("Switched to previous tab: [%d] %s\n", current->pageID, current->url);
    } else {
        printf("No previous tab available.\n");
    }
}
void showCurrentTab() {
    if (current != NULL) {
```

```
        printf("Current tab: [%d] %s\n", current->pageID, current->url);
    } else {
        printf("No tab is currently open.\n");
    }
}
void closeCurrentTab() {
    if (current == NULL) {
        printf("No tab to close.\n");
        return;
    }

    printf("Closing tab: [%d] %s\n", current->pageID, current->url);

    if (current->prev != NULL)
        current->prev->next = current->next;
    else
        head = current->next;

    if (current->next != NULL)
        current->next->prev = current->prev;

    Tab* temp = current;

    if (current->next != NULL)
        current = current->next;
    else
        current = current->prev;

    free(temp);
```

```
    if (current != NULL)
        printf("Now switched to tab: [%d] %s\n", current->pageID, current->url);
    else
        printf("No tabs open now.\n");
}
void showHistory() {
    if (head == NULL) {
        printf("No history available.\n");
        return;
    }

    Tab* temp = head;
    printf("History of tabs:\n");
   while (temp != NULL) {
        if (temp == current)
            printf("-> [%d] %s (Current)\n", temp->pageID, temp->url);
        else
            printf("   [%d] %s\n", temp->pageID, temp->url);
        temp = temp->next;
    }
}

int main() {
    int choice;
    while (1) {
        printf("\n--- Browser Menu ---\n");
        printf("1. Visit a new page\n");
        printf("2. Go back\n");
```

```
        printf("3. Go forward\n");
        printf("4. Show current tab\n");
        printf("5. Close current tab\n");
        printf("6. Show history\n");
        printf("7. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1: visitNewPage(); break;
            case 2: goBack(); break;
            case 3: goForward(); break;
            case 4: showCurrentTab(); break;
            case 5: closeCurrentTab(); break;
            case 6: showHistory(); break;
            case 7: printf("Exiting browser...\n"); exit(0);
            default: printf("Invalid choice! Try again.\n");
        }
    }
    return 0;
}
```

OUTPUTS

1.

```
--- Browser Menu ---
1. Visit a new page
2. Go back
3. Go forward
4. Show current tab
5. Close current tab
6. Show history
7. Exit
Enter your choice: 1
Enter URL: google.com
Opened new tab: [1] google.com
```

```
Enter your choice: 1
Enter URL: youtube.com
Opened new tab: [2] youtube.com
```

2.

```
Enter your choice: 2
Switched to previous tab: [1] google.com
```

3.

```
Enter your choice: 3
Switched to next tab: [2] youtube.com
```

4.

```
Enter your choice: 4
Current tab: [2] youtube.com
```

5.

```
Enter your choice: 5
Closing tab: [2] youtube.com
Now switched to tab: [1] google.com
```

6.

```
Enter your choice: 6
History of tabs:
-> [1] google.com (Current)
```

7.

```
Enter your choice: 7
Exiting browser...
```
