



Republic of the Philippines
PAMANTASAN NG LUNGSOD NG MAYNILA
Intramuros, Manila, Philippines

College of Information Systems and Technology Management

2nd Semester A.Y. 2023-2024

ICC 0104-1 DSA

GROUP 4

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SOURCE CODE FOR STACK

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <ctype.h>
#include <windows.h>

typedef struct STUDREC {
    char No[13];
    char Name[25];
    char Cyr[10];
    float GWA;
    struct STUDREC *next;
} STUDREC;

STUDREC *TOP = NULL;
char Resp;

void clearScreen() {
    system("cls");
}

void push(STUDREC **stack, STUDREC *node) {
    node->next = *stack;
    *stack = node;
}

void deleteTop() {
    if (TOP == NULL) {
        printf("Stack is empty!\n");
        return;
    }
    STUDREC *temp = TOP;
    TOP = TOP->next;
    free(temp);
    printf("Top node deleted successfully!\n");
}

void traverseStack() {
    STUDREC *current = TOP;
    if (current == NULL) {
```



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```
printf("The Student Record is Empty!\n");
} else {
    clearScreen();
    printf("\t\t\t\tStudent Record\n");

printf("_____\n");
    printf("| %-12s | %-25s | %-10s | %s | \n", "Number", "Name", "Crs & Yr",
"GWA");

printf("_____\n");

    while (current != NULL) {
        printf("| %-12s | %-25s | %-10s | %.2f | \n", current->No, current->Name,
current->Cyr, current->GWA);
        current = current->next;
    }

printf("_____\n");
}
}

void gotoxy(short x, short y) {
    COORD pos = {x, y};
    SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE), pos);
}

int main() {
    Resp = 'Y';

    do {
        clearScreen();
        printf("\nMain Menu:\n");
        printf("1. Create Student Record Stack\n");
        printf("2. Add Student Record\n");
        printf("3. Delete Top Student Record\n");
        printf("4. Display Student Records\n");
        printf("5. Exit\n");
        printf("\nEnter your choice: ");
```



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```
int choice;
scanf("%d", &choice);

switch(choice) {
    case 1: {
        clearScreen();
        if (TOP == NULL) {
            printf("\nCreating Student Stack...\n");

            do {
                STUDREC *NewNode = (STUDREC *)malloc(sizeof(STUDREC));
                if (NewNode == NULL) {
                    printf("Memory allocation failed\n");
                    return 1;
                }

                printf("\nEnter Student Number: ");
                scanf("%12s", NewNode->No);
                printf("Enter Student Name: ");
                getchar();
                fgets(NewNode->Name, sizeof(NewNode->Name), stdin);
                NewNode->Name[strcspn(NewNode->Name, "\n")] = '\0';
                printf("Enter Student Course & Year: ");
                fgets(NewNode->Cyr, sizeof(NewNode->Cyr), stdin);
                NewNode->Cyr[strcspn(NewNode->Cyr, "\n")] = '\0';
                printf("Enter Student GWA: ");
                scanf("%f", &NewNode->GWA);

                NewNode->next = TOP;
                TOP = NewNode;

                printf("\nAdd Another Record [Y/N]?: ");
                getchar();
                scanf("%c", &Resp);
            } while (toupper(Resp) == 'Y');
        } else {
            printf("\nStudent Stack already exists.\n");
        }
        break;
    }
    case 2: {
        if (TOP == NULL) {
```



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```
printf("\nPlease create the Student Stack first!\n");
} else {
    clearScreen();
    do {
        STUDREC *NewNode = (STUDREC *)malloc(sizeof(STUDREC));
        if (NewNode == NULL) {
            printf("Memory allocation failed\n");
            return 1;
        }

        printf("\nEnter Student Number: ");
        scanf("%12s", NewNode->No);
        printf("Enter Student Name: ");
        getchar();
        fgets(NewNode->Name, sizeof(NewNode->Name), stdin);
        NewNode->Name[strcspn(NewNode->Name, "\n")] = '\0';
        printf("Enter Student Course & Year: ");
        fgets(NewNode->Cyr, sizeof(NewNode->Cyr), stdin);
        NewNode->Cyr[strcspn(NewNode->Cyr, "\n")] = '\0';
        printf("Enter Student GWA: ");
        scanf("%f", &NewNode->GWA);

        NewNode->next = TOP;
        TOP = NewNode;

        printf("\nAdd Another Record [Y/N]?: ");
        getchar();
        scanf("%c", &Resp);
    } while (toupper(Resp) == 'Y');
}
break;
}
case 3: {
    if (TOP == NULL) {
        printf("\nPlease create the Student Stack first!\n");
    } else {
        deleteTop();
    }
    break;
}
case 4: {
    if (TOP == NULL) {
```



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```
        printf("\nPlease create the Student Stack first!\n");
    } else {
        traverseStack();
    }
    break;
}
case 5: {
    printf("Exiting program...");
    return 0;
}
default: {
    printf("Invalid choice! Please try again.");
    break;
}
}

printf("\nPress Enter to continue...");
getchar();
getchar();

} while (1);

return 0;
}
```

SAMPLE OUTPUTS FOR STACKS

1. Creation of Stack

```
Main Menu:
1. Create Student Record Stack
2. Add Student Record
3. Delete Top Student Record
4. Display Student Records
5. Exit

Enter your choice: 1|
```



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```
Creating Student Stack...

Enter Student Number: 2023-11111
Enter Student Name: Marie Curie
Enter Student Course & Year: BSCS 1-1
Enter Student GWA: 1.00

Add Another Record [Y/N]?: y

Enter Student Number: 2023-22222
Enter Student Name: Ada Lovelace
Enter Student Course & Year: BSCS 1-2
Enter Student GWA: 1.00

Add Another Record [Y/N]?: y

Enter Student Number: 2023-33333
Enter Student Name: Florence Nightingale
Enter Student Course & Year: BSCS 1-2
Enter Student GWA: 1.00

Add Another Record [Y/N]?: n

Press Enter to continue...|
```

if you tried to create even if it already exists:

```
Student Stack already exists.

Press Enter to continue...|
```

2. Traversal of Stack

```
Main Menu:
1. Create Student Record Stack
2. Add Student Record
3. Delete Top Student Record
4. Display Student Records
5. Exit

Enter your choice: 4|
```



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Student Record				
Number	Name	Crs & Yr	GWA	
2023-33333	Florence Nightingale	BSCS 1-2	1.00	
2023-22222	Ada Lovelace	BSCS 1-2	1.00	
2023-11111	Marie Curie	BSCS 1-1	1.00	

Press Enter to continue...|

If no item exists in the stack:

Enter your choice: 4
Please create the Student Stack first!
Press Enter to continue...|

3. Adding Node in Stack

Main Menu:
1. Create Student Record Stack
2. Add Student Record
3. Delete Top Student Record
4. Display Student Records
5. Exit
Enter your choice: 2|

Enter Student Number: 2023-33333
Enter Student Name: Jane Austen
Enter Student Course & Year: BSCS 1-3
Enter Student GWA: 2.00
Add Another Record [Y/N]?: n
Press Enter to continue...|



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Student Record				
Number	Name	Crs & Yr	GWA	
2023-33333	Jane Austen	BSCS 1-3	2.00	
2023-33333	Florence Nightingale	BSCS 1-2	1.00	
2023-22222	Ada Lovelace	BSCS 1-2	1.00	
2023-11111	Marie Curie	BSCS 1-1	1.00	

Press Enter to continue...|

4. Deleting Node in Stack

```
Main Menu:
1. Create Student Record Stack
2. Add Student Record
3. Delete Top Student Record
4. Display Student Records
5. Exit

Enter your choice: 3
Top node deleted successfully!

Press Enter to continue...|
```

Student Record				
Number	Name	Crs & Yr	GWA	
2023-33333	Florence Nightingale	BSCS 1-2	1.00	
2023-22222	Ada Lovelace	BSCS 1-2	1.00	
2023-11111	Marie Curie	BSCS 1-1	1.00	

Press Enter to continue...|

If all items are deleted/no element exists:

```
Enter your choice: 3

Please create the Student Stack first!

Press Enter to continue...|
```



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5. Exit

```
Main Menu:
1. Create Student Record Stack
2. Add Student Record
3. Delete Top Student Record
4. Display Student Records
5. Exit

Enter your choice: 5
Exiting program...

-----
Process exited after 2.635 seconds with return value 0
Press any key to continue . . .
```