**ASSIGNMEN-2**

**Name:sivagovindan**

**Reg no:RA2311003050377**

**Year & Branch: II B.Tech CSE - F Section**

**Assignment No: 2**

**Github profile: https://github.com/Sivagovindan4/DSA-ASSIGNMENT-2**

**Implementation of Matrix Multiplication using Dynamic Memory Allocation. Ensureto allocate the memory using appropriate functions and access the array using pointers.**

**ANS:**

**#include<stdio.h>**

**#include<stdlib.h>**

**int main(){**

**int r,c,i,j,k;**

**//input no of rows and columns**

**printf("enter no of rows:");**

**scanf("%d",&r);**

**printf("enter no of colomns:");**

**scanf("%d",&c);**

**// dynamic memory allocation for matrix a,matrix b and resultant matrix**

**int \*\*a=(int\*\*)malloc(r\* sizeof(int\*));**

**for(i=0;i<r;i++){**

**a[i]=(int\*)malloc(c\*sizeof(int));**

**}**

**int \*\*b=(int\*\*)malloc(r\*sizeof(int\*));**

**for(i=0;i<r;i++){**

**b[i]=(int\*)malloc(c\*sizeof(int));**

**}**

**int \*\*mul =(int\*\*)malloc(r\*sizeof(int\*));**

**for(i=0;i<r;i++){**

**mul[i]=(int\*)malloc(c\*sizeof(int));**

**}**

**//get matrix 1 and 2 value**

**printf("enter matrix 1 values:\n");**

**for(i=0;i<r;i++){**

**for(j=0;j<c;j++){**

**scanf("%d",&a[i][j]);**

**}**

**}**

**printf("enter matrix 2 value:\n");**

**for(i=0;i<r;i++){**

**for(j=0;j<c;j++){**

**scanf("%d",&b[i][j]);**

**}**

**}**

**//matrix multiplication**

**printf("matrix multiplication:\n");**

**for(i=0;i<r;i++){**

**for(j=0;j<c;j++){**

**mul[i][j]=0;**

**for(k=0;k<c;k++){**

**mul[i][j]+=a[i][k]\*b[k][j];**

**}**

**}**

**}**

**//resultant matrix**

**for(i=0;i<r;i++){**

**for(j=0;j<c;j++){**

**printf("%d\t",mul[i][j]);**

**}**

**printf("\n");**

**}**

**//free dynamically allocated memory**

**for(i=0;i<r;i++){**

**free(a[i]);**

**free(b[i]);**

**free(mul[i]);**

**}**

**free(a);**

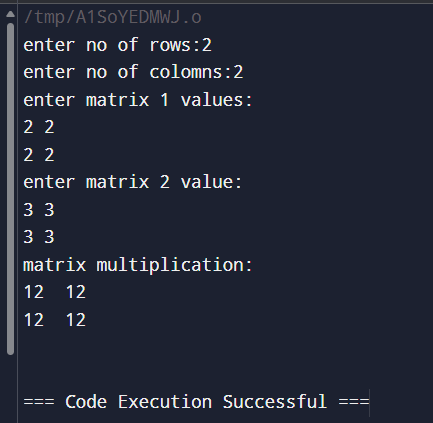
**free(b);**

**free(mul);**

**return 0;**

**}**

**OUTPUT:**

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**2. You are given a task with creating a simple student management system using arraysthat will allow the user to manage student names. Implement the following operationson a list of student names using switch-case and arrays. After every operation,display the current list of students.**

**The operations to implement are:**

**(i) Creation of the list: Allow the user to create a list of student names by enteringthem one by one.**

**(ii) Insertion of a new student: Insert a new student's name into a specific positionin the list. The user should provide the name and the index at which it shouldbe inserted.**

**(iii) Deletion of a student: Delete a student's name from the list based on theirposition or name. Ask the user whether they want to delete by name or by index.**

**(iv) Traversal of the list: Display all the student names in the current order.**

**(v) Search for a student: Search for a student's name in the list and displaywhether or not the student is found, along with their position if present.**

**ANS:**

**#include <stdio.h>**

**#include <string.h>**

**#define MAX 100**

**#define MAX\_NAME\_LEN 50**

**void displayList(char students[][MAX\_NAME\_LEN], int size) {**

**printf("Student list: ");**

**for (int i = 0; i < size; i++) {**

**printf("%s", students[i]);**

**if (i < size - 1) printf(", ");**

**}**

**printf("\n");**

**}**

**// Function to create a list of students**

**void createList(char students[][MAX\_NAME\_LEN], int \*size) {**

**printf("Enter the number of students: ");**

**scanf("%d", size);**

**for (int i = 0; i < \*size; i++) {**

**printf("Enter name of student %d: ", i + 1);**

**scanf("%s", students[i]);**

**}**

**}**

**// Function to insert a new student**

**void insertStudent(char students[][MAX\_NAME\_LEN], int \*size) {**

**char name[MAX\_NAME\_LEN];**

**int pos;**

**printf("Enter name to insert: ");**

**scanf("%s", name);**

**printf("Enter position (0-based index): ");**

**scanf("%d", &pos);**

**if (pos < 0 || pos > \*size) {**

**printf("Invalid position!\n");**

**return;**

**}**

**for (int i = \*size; i > pos; i--) {**

**strcpy(students[i], students[i - 1]);**

**}**

**strcpy(students[pos], name);**

**(\*size)++;**

**}**

**// Function to delete a student**

**void deleteStudent(char students[][MAX\_NAME\_LEN], int \*size) {**

**int pos;**

**printf("Enter position (0-based index) to delete: ");**

**scanf("%d", &pos);**

**if (pos < 0 || pos >= \*size) {**

**printf("Invalid position!\n");**

**return;**

**}**

**for (int i = pos; i < \*size - 1; i++) {**

**strcpy(students[i], students[i + 1]);**

**}**

**(\*size)--;**

**}**

**// Function to search for a student**

**void searchStudent(char students[][MAX\_NAME\_LEN], int size) {**

**char name[MAX\_NAME\_LEN];**

**printf("Enter name to search: ");**

**scanf("%s", name);**

**for (int i = 0; i < size; i++) {**

**if (strcmp(students[i], name) == 0) {**

**printf("%s found at position %d\n", name, i);**

**return;**

**}**

**}**

**printf("%s not found!\n", name);**

**}**

**int main() {**

**char students[MAX][MAX\_NAME\_LEN];**

**int size = 0, choice;**

**do {**

**printf("\n1. Create list\n2. Insert student\n3. Delete student\n4. Display list\n5. Search student\n6. Exit\n");**

**printf("Enter your choice: ");**

**scanf("%d", &choice);**

**switch (choice) {**

**case 1: createList(students, &size); break;**

**case 2: insertStudent(students, &size); break;**

**case 3: deleteStudent(students, &size); break;**

**case 4: displayList(students, size); break;**

**case 5: searchStudent(students, size); break;**

**case 6: printf("Exiting...\n"); break;**

**default: printf("Invalid choice!\n");**

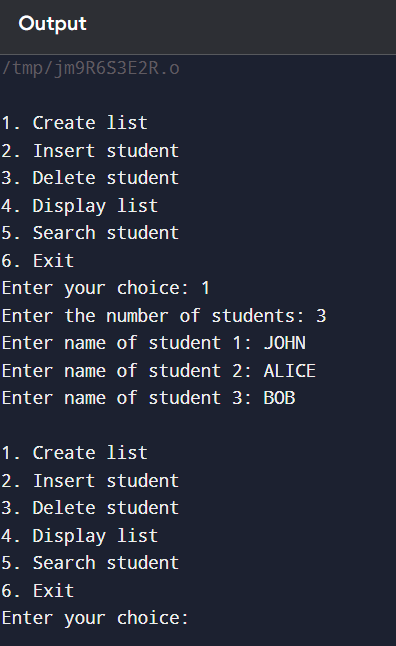
**}**

**} while (choice != 6);**

**return 0;**

**}**

**OUTPUT:**

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