

Name:Ali hassan

Reg.no:Sp20-bse-013

Section :A

Topic :Strings and 2d arrays

2D Arrays

Exercise 1:

Develop a program to calculate the sum two 3x3 matrices and display the sum on the screen

***Note:***



Program:

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| #include<stdio.h>  **int** **main**(){  **int** x[**3**][**3**]={{**2**,**2**,**2**},{**2**,**2**,**2**},{**2**,**2**,**2**}};  **int** y[**3**][**3**]={{**2**,**2**,**2**},{**2**,**2**,**2**},{**2**,**2**,**2**}};  **int** z[**3**][**3**]={{},{}};  **for**(**int** i=**0**;i<**3**;i++){  **for**(**int** j=**0**;j<**3**;j++){  z[i][j]=x[i][j]+y[i][j];  }  }  printf("The sum of 3X3 arrays is :")  **for**(**int** i=**0**;i<**3**;i++){  **for**(**int** j=**0**;j<**3**;j++){  printf("z[%d][%d]=%d ",i,j,z[i][j]);  }  printf("**\n**");  }  **return** **0**;  } |

Exercise 2

Program Name: Sum the elements of a 2 dimensional array

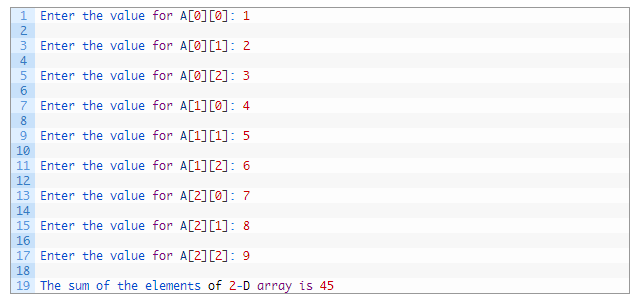
Program Purpose: Using multiple-subscripted (2 dimensional) array with nested loop

Problem Statement: Write a program which declares a 2D array of size 3x3. The values of the array are input by the user at run-time (see sample output). After inputting the array values, show the sum of all the elements in the array.

Program:

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| #include<stdio.h>  **int** **main**(){  **int** x[**3**][**3**];  **int** sum=**0**;  **for**(**int** i=**0**;i<**3**;i++){  **for**(**int** j=**0**;j<**3**;j++){  printf("Enter a value for X[%d][%d]:",i,j);  scanf("%d",&x[i][j]);  sum+=x[i][j];  }  }  printf("The sum of all elements of the array is :%d",sum);  } |

Sample Output:



**Strings**

Exercise 1:

Compare strings "ABCDE" and "ABCE" using strcmp.

Compare strings "ABCDE" and "" using strcmp.

Compare strings "Pakistan" and "Iran" using strcmp.

Compare strings "Pak" and "Iran" using strcmp.

Concatenate strings “Pak ” and “China” using strcat.

Concatenate strings “Pak ” and “China” and str1 = “ Economic Corridor” using strcat.

Concatenate strings “Pak ” and “China” using strcat and copy in str3 using strcpy.

Exercise 2:

Allocate memory for a string of 15 characters and assign “new string” to it. Print the string. Now, try following options:

Change the string to “another string” using assignment operator.

Change the string to “another string” using strcpy.

Note down whether the address changes in both cases or not.

Program:

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| #include<stdio.h>  #include<string.h>  **int** **main**()  {  **char** s1[**5**]="ABCDE";  **char** s2[**4**]="ABCE";  **char** s3[**5**]="";  **char** s4[**10**]="Pakistan";  **char** s5[**10**]="Iran";  **char** s6[**10**]="Pak";  **char** s7[**10**]="China";  **char** s8[**10**]="Economic corridor";  printf("The comparison of ABCDE and ABCE strings returns %d**\n**",strcmp(s1,s2));  printf("The comparison of ABCDE "" strings returns %d**\n**",strcmp(s1,s3));  printf("The comparison of Pakistan and Iran return %d**\n**",strcmp(s4,s5));  printf("The comparison of Pak and Iran return %d**\n**",strcmp(s6,s5));  printf("The concatenation of Pakistan and China return**\n** ");  puts(strcat(s6,s7));  printf("The concatenation of PakChina and Economic corridor is**\n** ");  puts(strcat(s6,s8));  } |

Exercise 3:

Write a program which should take an organization name from the user and then print the abbreviation on the screen.

E.g. Organization Name is Pakistan Steel and its abbreviation is PS

Program:

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| #include<stdio.h>  **int** **main**(){  **char** str[**100**];  **int** i,j;  printf("Enter the name of your organization:");  gets(str);  printf("The abbreviation is :");  printf("%c",str[**0**]);  **for**(i=**0**;str[i]!='\0';i++){  **if**(str[i]==' '){  j=i+**1**;  printf("%c",str[j]);  }  }  } |

Exercise 4:

C Program to Find the Number of Vowels (a , e , i , o , u), Digits (0 to 9) and White space in a String

Program:

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| #include <stdio.h>  **int** **main**()  {  **int** c = **0**, count\_vowel = **0**,count\_int=**0**,count\_space=**0**;  **char** s[**1000**];  printf("Input a string**\n**");  gets(s);  **while** (s[c] != '\0') {  **if** (s[c] == 'a' || s[c] == 'A' || s[c] == 'e' || s[c] == 'E' || s[c] == 'i' || s[c] == 'I' || s[c] =='o' || s[c]=='O' || s[c] == 'u' || s[c] == 'U')  {count\_vowel++;}  **else** **if**((**int**)s[c]>=**48** && (**int**)s[c]<=**57**)count\_int++;  **else** **if**(s[c]==' ')count\_space++;  c++;  }  printf("Number of vowels in the string: %d**\n**", count\_vowel);  printf("The number of integers in the string is :%d**\n**",count\_int);  printf("The number of spaces in the string is :%d**\n**",count\_space);  **return** **0**;  } |

Exercise 5:

C Program to Reverse a Sentence by Recursion and with loops.

Program:

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| #include<stdio.h>  **void** **reverse**(**char** \*p){  **if**(p[**0**]=='\0')  **return**;  **else** reverse(&p[**1**]);  printf("%c",p[**0**]);  }  **int** **main**()  {  **char** str[**100**];  printf("Enter a string :");  gets(str);  printf("The reversed string is :**\n**");  reverse(str);  **return** **0**;  } |