Assignment - 22

DMA

1. Define a function to input variable length string and store it in an array without

memory wastage.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of character : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   char \*p;

   char str[100];

    p =(char\*)malloc(sizeof(char));

for(i=0;i<n;i++)

scanf("%c",p+i);

for(i=0;i<n;i++)

str[i]=\*(p+i);

printf(" %s ",str);

free(p);

p = NULL;

}

Output

Enter number of character : 4

dffd

dffd

2. Write a program to ask the user to input a number of data values he would like to

enter then create an array dynamically to accommodate the data values. Now take

the input from the user and display the average of data values.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   int \*p;

   int str[100];

   int avg=0;

   int ans;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

for(i=0;i<n;i++)

str[i]=\*(p+i);

for(i=0;i<n;i++)

 avg = avg + str[i];

 ans = avg/n;

 printf("The average value of array : %d ",ans);

free(p);

p = NULL;

}

Output

Enter number of values : 3

2 4 5

The average value of array : 3

3. Write a program to calculate the sum of n numbers entered by the user using malloc

and free.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   int \*p;

   int str[100];

   int sum=0;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

for(i=0;i<n;i++)

str[i]=\*(p+i);

for(i=0;i<n;i++)

 sum = sum + str[i];

 printf("The sum of value of array : %d ",sum);

free(p);

p = NULL;

}

Output

Enter number of character : 3

3 4 5

The sum of value of array : 12

4. Write a program to input and print text using dynamic memory allocation.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of character : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   char \*p;

   ;

    p =(char\*)malloc(sizeof(char));

for(i=0;i<n;i++)

scanf("%c",p+i);

for(i=0;i<n;i++)

printf("%c",\*(p+i));

free(p);

p = NULL;

}

Output

Enter number of character : 5

Dhruv

Dhruv

5. Write a program to read a one dimensional array, print sum of all elements along with

inputted array elements using dynamic memory allocation.

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   int \*p;

   int sum=0;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

for(i=0;i<n;i++)

 sum = sum + \*(p+i);

 printf("The sum of value of array : %d ",sum);

free(p);

p = NULL;

}

Output

Enter number of values : 3

4 5 6

The sum of value of array : 15

6. Write a program in C to find the largest element using Dynamic Memory Allocation.

Code

#include<stdio.h>

#include <stdlib.h>

int Display\_greatest\_value(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

 printf("The greatest number in values : %d ", Display\_greatest\_value(n));

    return 0;

}

int Display\_greatest\_value(int n)

{

    int i,j;

   int \*p;

   int sum=0;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

 for(i=0;i<n;i++)

    {

       if(\*(p)<\*(p+i))

       {

        \*(p)= \*(p+i);

       }

    }

    return \*(p);

free(p);

p = NULL;

}

Output

Enter number of values : 3

3 6 4

The greatest number in values : 6

7. Write a program to demonstrate memory leak in C.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   int \*p;

   int sum=0;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

for(i=0;i<n;i++)

 sum = sum + \*(p+i);

 printf("The sum of value of array : %d \n",sum);

printf("memory leakage occurs as \*p lost dma malloc variable base adress after finishing this function ");

}

Output

Enter number of values : 3

3 4 5

The sum of value of array : 12

memory leakage occurs as \*p lost dma malloc variable base adress after finishing this function

8. Write a program to demonstrate dangling pointers in C.

Code

#include<stdio.h>

int main()

{

    int \*p;

    p = fun();

    \*p = 3;

    return 0;

}

int\* fun()

{

    int n;

    return &n;

}

9. Write a program to allocate memory dynamically of the size in bytes entered by the

user. Also handle the case when memory allocation is failed.

Code

#include<stdio.h>

#include <stdlib.h>

void Display\_array(int);

int main()

{

   int n,s;

printf("Enter Total size of int values in bytes : ");

scanf("%d,",&s);

fflush(stdin);

n=2\*s;

Display\_array(n);

    return 0;

}

void Display\_array(int n)

{

    int i;

   int \*p;

   int sum=0;

    p =(int\*)malloc(sizeof(int));

printf("Enter %d int values as [4 bit = 0.5 bytes]  : \n",n);

for(i=0;i<n;i++)

scanf("%d",p+i);

if(p==NULL)

    {

        printf("Sorry! unable to allocate memory");

        exit(0);

    }

printf("The given array :\n");

for(i=0;i<n;i++)

printf(" %d ",\*(p+i));

free(p);

p = NULL;

}

Output

Enter Total size of int values in bytes : 2

Enter 4 int values as [4 bit = 0.5 bytes] :

4 5 3 2

The given array :

4 5 3 2

10. Find out the maximum and minimum from an array using dynamic memory allocation

in C.

code

#include<stdio.h>

#include <stdlib.h>

void Display\_greatest\_and\_smallest\_value(int);

int main()

{

   int n;

printf("Enter number of values : ");

scanf("%d,",&n);

fflush(stdin);

Display\_greatest\_and\_smallest\_value(n);

    return 0;

}

void Display\_greatest\_and\_smallest\_value(int n)

{

    int i,j;

   int \*p;

   int sum=0;

    p =(int\*)malloc(sizeof(int));

for(i=0;i<n;i++)

scanf("%d",p+i);

 for(i=0;i<n;i++)

    {

       if(\*(p)<\*(p+i))

       {

        \*(p)= \*(p+i);

       }

    }

    printf("The greatest number in values : %d \n", \*(p));

    for(i=0;i<n;i++)

    {

       if(\*(p)>\*(p+i))

       {

        \*(p)= \*(p+i);

       }

    }

    printf("The smallest number in values : %d ", \*(p));

free(p);

p = NULL;

}

Output

Enter number of values : 3

4 3 5

The greatest number in values : 5

The smallest number in values : 3