**CA3001 – Programming and Data Structures using C**

**Assignment 12 - 13.02.2021**

**Q1.** To create memory for int, char and float variable at run time.

Ans – C Program & Output:

#include <stdio.h>

#include<stdlib.h>

int main()

{

int i,j,k,\*ptr1;

float \*ptr2;

char \*ptr3;

printf("enter the no. of elements of int type you want to allocate\n");

scanf("%d",&i);

ptr1=(int\*)malloc(i\*sizeof(int));

printf("enter the no. of elements of float type you want to allocate\n");

scanf("%d",&j);

ptr2=(float\*)malloc(j\*sizeof(float));

printf("enter the no. of elements of char type you want to allocate\n");

scanf("%d",&k);

ptr3=(char\*)malloc(i\*sizeof(char));

if(ptr1!=NULL)

printf("memory for int is allocated successfully!!\n");

else

printf("ERROR!!! memory not allocated fot int\n");

if(ptr2!=NULL)

printf("memory for float is allocated successfully!!\n");

else

printf("ERROR!!! memory not allocated fot float\n");

if(ptr3!=NULL)

printf("memory for char is allocated successfully!!\n");

else

printf("ERROR!!! memory not allocated fot char\n");

free(ptr1);

free(ptr2);

free(ptr3);

return 0;

}

Output-

enter the no. of elements of int type you want to allocate

5

enter the no. of elements of float type you want to allocate

7

enter the no. of elements of char type you want to allocate

3

memory for int is allocated successfully!!

memory for float is allocated successfully!!

memory for char is allocated successfully!!

**Q2.** To input and print text using Dynamic Memory Allocation.

Ans – C Program & Output:

#include <stdio.h>

#include <stdlib.h>

int main()

{

int n;

char \*text;

printf("Enter limit of the text: ");

scanf("%d",&n);

text=(char\*)malloc(n\*sizeof(char));

printf("Enter text: ");

scanf(" ");

gets(text);

printf("Inputted text is: %s\n",text);

free(text);return 0;

}

Output-

Enter limit of the text: 9

Enter text: dghj

Inputted text is: dghj

**Q3.** To read a one dimensional array, print sum of all elements along with inputted array elements using Dynamic Memory Allocation.

Ans – C Program & Output:

#include <stdio.h>

#include<stdlib.h>

int main()

{

int n;

int j,sum=0;

printf("enter the size of array\n");

scanf("%d",&n);

int\*arr= (int\*)malloc (n \* sizeof(int));

printf("enter the array elements\n");

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

{

scanf("%d",arr+j);

}

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

{

sum=sum+\*(arr+j);

}

printf("the sum is\t");

printf("%d",sum);

return 0;

}

Output-

enter the size of array

5

enter the array elements

1

2

3

4

5

the sum is 15

**Q4.** To read and print the student details using structure and Dynamic Memory Allocation.

Ans – C Program & Output:

#include <stdio.h>

#include <stdlib.h>

struct student

{

char name[30];

int roll;

float marks;

};

int main()

{

struct student \*std;

int n,i;

printf("Enter total number of elements: ");

scanf("%d",&n);

std=(struct student\*)malloc(n\*sizeof(struct student));

if(std==NULL)

{

printf("memory not allocated\n");

exit(0);

}

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

{

printf("\nEnter details of student [%d]:\n",i+1);

printf("Enter name: ");

scanf(" ");

gets((std+i)->name);

printf("Enter roll number: ");

scanf("%d",&(std+i)->roll);

printf("Enter marks: ");

scanf("%f",&(std+i)->marks);

}

printf("\nEntered details are:\n");

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

{

printf("%s \t %d \t %.2f\n",(std+i)->name,(std+i)->roll,(std+i)->marks);

}

return 0;

}

Output-

Enter total number of elements: 1

Enter details of student [1]:

Enter name: luckt

Enter roll number: 122

Enter marks: 93.1

Entered details are:

luckt 122 93.10

Q5. find sum of N elements entered by user. To perform this program, allocate memory dynamically using malloc() function.

Ans – C Program & Output:

#include <stdio.h>

#include <stdlib.h>

int main()

{

int n;

int j,sum=0;

printf("enter the size of array\n");

scanf("%d",&n);

int\*arr= (int\*)malloc (n \* sizeof(int));

printf("enter the array elements\n");

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

{

scanf("%d",arr+j);

}

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

{

sum=sum+\*(arr+j);

}

printf("the sum is\t");

printf("%d",sum);

return 0;

}

Output-

enter the size of array

5

enter the array elements

1

2

3

4

5

the sum is 15

6. to find Largest of N Numbers. To perform this program, allocate memory dynamically using calloc() and realloc() function.

Ans – C Program & Output:

#include <stdio.h>

#include <stdlib.h>

int main()

{

int n;

float \*ptr;

printf("Enter the total number of elements: ");

scanf("%d", &n);

ptr = (float \*)calloc(n, sizeof(float));

if (ptr == NULL) {

printf("Error!!! memory not allocated.");

exit(0);

}

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

printf("Enter Number %d: ", i + 1);

scanf("%f", ptr + i);

}

for (int i = 1; i < n;i++) {

if (\*ptr< \*(ptr + i))

\*ptr = \*(ptr + i);

}

printf("Largest number = %.2f", \*ptr);

return 0;

Output-

Enter the total number of elements: 6

Enter Number 1: 1

Enter Number 2: 8

Enter Number 3: 6

Enter Number 4: 9

Enter Number 5: 5

Enter Number 6: 7

Largest number = 9.00