Institute of Computer Technology
B. Tech Computer Science and Engineering
Subject: ESFP-II (2CSE203)

PRACTICAL-1

AIM: - To learn about Dynamic Memory allocation.

***Exercise*: -**

1. I wants to find the largest value from the list and all list elements are assigned memory at runtime not compile time.

Test Data:

Input total number of elements (1 to 100): 5
Number 1: 5
Number 2: 7
Number 3: 2
Number 4: 9
Number 5: 8
The Largest element is: 9.00

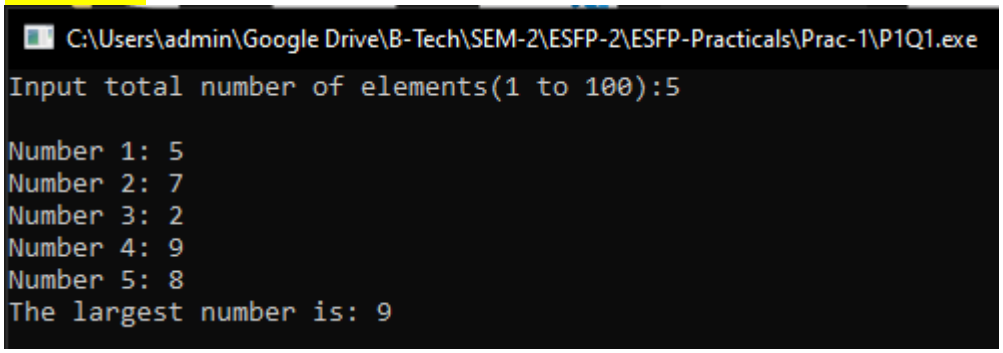
CODE:

```
#include <iostream>
#include <conio.h>
#include <cstdlib>
using namespace std;
int main()
{
   int i,n;
   int *num;

   printf("Input total number of elements(1 to 100):");
   scanf("%d",&n);
   num=(int*) calloc(n, sizeof(int));
   if(num==NULL) {
      printf("No memory is allocated.\n");
      exit(0);
   }
   printf("\n");
   for (i = 0; i < n; ++i)
   {
      printf("Number %d: ",i+1);
      scanf("%d",num+i);
   }
   for (i = 1; i < n; ++i)
   {
      if(*num<*(num+i)) {
         *num=*(num+i);
      }
```

```
    }
    printf("The largest number is: %d\n",*num);
    getch();
    return 0;
}
```

OUTPUT:



2. Developer wants to take input text and print that text using reallocated memory & memory which can be released by compiler.

CODE:

```
#include <iostream>
#include <cstdlib>
#include <string>
#include <conio.h>
using namespace std;
int main() {
    int n;
    char *name;
    cout<<"Enter a size of string"<<endl;
    cin>>n;
    name=(char*) malloc(n*sizeof(char));
    cout<<"Enter a string=";
    fflush(stdin); //buffered memory is cleared
    gets(name);
    cout<<"You entered= "<<name<<endl;

    cout<<"Enter resize of string length: ";
    cin>>n;
    name=(char*)realloc(name, sizeof(char));

    cout<<"Enter a string: ";
    fflush(stdin); //buffered memory clear
    gets(name);
    cout<<"\nYou entered="<<name<<endl;
    free(name);
    getch();
    return 0;
}
```

OUTPUT:

```
Enter a size of string
5
Enter a string=Yash
You entered= Yash
Enter resize of string length: 15
Enter a string: Yash Prajapati

You entered=Yash Prajapati
```

3. How can we create n number of strings with m length using runtime memory?

CODE:

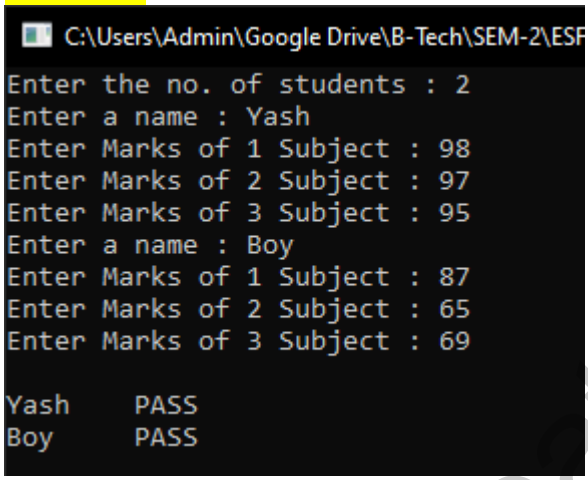
```
#include <iostream>
#include <cstring>
#include <cstdlib>
#include <conio.h>
using namespace std;

struct student
{
        char name[10];
        int m[3];
        int total;
        char result[5];
}*p,*s;

int main()
   {
    int i,j,l,n;
     cout<<"Enter the no. of students : ";
    cin>>n;
     p=(struct student*)malloc(n*sizeof(struct student));
     s=p;
     for(i=0;i<n;i++)
 {
    cout<<"Enter a name : ";
    scanf("%s",&p->name);
    p-> total=0;l=0;
    for(j=0;j<3;j++)
    {
     one:
     cout<<"Enter Marks of "<<j+1<<" Subject : ";
     scanf("%d",&p->m[j]);
     if((p->m[j])>100)
     {
       cout<<"Wrong Value Entered";
       goto one;
     }
      p->total+=p->m[j];
      if(p->m[j]<40)
      l=1;
```

```
    }
   if(l==0)
  strcpy(p->result,"PASS");
   else
     strcpy(p->result,"FAIL");
  p++;
    }
    for(i=0;i<n;i++)
   {
    printf("\n%s\t%s",s->name,s->result);
    s++;
   }
   getch();
   return 0;
}
```

OUTPUT:



Post Practical Work:

1. How will you free the memory allocated by the following program?

```
#include<stdio.h>
#include<stdlib.h>
#define MAXROW 3
#define MAXCOL 4
int main()
{
int **p, i, j;
p = (int **) malloc(MAXROW * sizeof(int*));
return 0;
}
```

A. memfree(int p);
B. dealloc(p);
C. malloc(p, 0);
D. free(p);

2. Assume integer is 2 bytes wide. How many bytes will be allocated for the following code?

```
#include<stdio.h>
#include<stdlib.h>
#define MAXROW 3
#define MAXCOL 4
int main()
{
int (*p)[MAXCOL];
p = (int (*) [MAXCOL])malloc(MAXROW *sizeof(*p));
return 0;
}
```

A. 56 bytes
B. 128 bytes
C. 24 bytes
D. 12 bytes

3. How many bytes of memory will the following code reserve?

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
int *p;
p = (int *)malloc(256 * 256);
if(p == NULL)
printf("Allocation failed");
return 0;
}
```

A. 65536
B. Allocation failed
C. Error
D. No output