



PROGRAMMING

FOR PROBLEM SOLVING

{ C LANGUAGE }



Module :- 11

Dynamic Memory Allocation

Start



Module 11 :- dynamic memory allocation

- Malloc()
- Calloc()
- Realloc()
- Free()

Dynamic Memory Allocation

It is used to allow the allocation of memory at runtime.

There are four function are used to achieve dynamic memory allocation.

1. malloc()
2. calloc()
3. realloc()
4. free()



malloc()

It stands for Memory Allocation.

It allocates/reserves a single block of memory of specified size.

It returns NULL if memory is insufficient.

malloc function returns the address of first byte in the allocated memory if memory is sufficient.

Syntax

Ptr = (cast-type*)malloc(byte-size)

Here ptr is the pointer, cast-type is the data type in which we want to cast the returning pointer, byte-size is the allocated memory space.

Example

```
p = (int*) malloc(50 * sizeof(int));
```

Here in the above example the given statements allocates 100 or 200 bytes of memory. If the size of int is 2 then $50 * 2 = 100$ bytes will be allocated, if the size of int is 4 then $50 * 4 = 200$ bytes will be allocated. Pointer p holds the address of first byte of allocated memory.

calloc()



It stands for contiguous allocation.

It allocates/reserves a multiple block of memory of same size.

The allocated memory space is initialized to zero.

It returns NULL if memory is insufficient.

Syntax

```
ptr=(cast-type*)calloc(number of block,size of each block)
```

Here ptr is the pointer,cast-type is the data type in which we want to cast the returning pointer.

Example

```
p = (float*) calloc(50 , sizeof(float));
```

Here in the above example the given statements allocates 50 block of memory space with size of 4 byte because size of float is 4 byte.



realloc()

If the allocated memory space is insufficient then it is possible to modify the allocated space. realloc function is used to modify the size of previously allocated memory.

Syntax

```
ptr = realloc(ptr, new size );
```

free()

This function is used to free the allocated memory space.

Syntax

```
free(ptr);
```







Thank You !!

Dhanybad !!

Shukriya !!