



PROGRAMMING LAB **ASSIGNMENT- 1**

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~: Programming Lab Assignment - 7 :~

① (a) malloc() :~

The "malloc" or "memory allocation" method in C is used to dynamically allocate a single large block of memory with the specified size. It returns a pointer of type void which can be cast into a pointer of any form.

It doesn't initialize memory at execution time so that it has to initialize each block with the default garbage value initially.

Syntax:

$$Ptr = (\text{Cast-type}^*) \text{ malloc}(\text{byte-size})$$

(b) calloc() :~

"Calloc" or "Contiguous allocation" method in C is used to dynamically allocate the specified number of blocks of memory of the specified type. It is very much similar to malloc() but has two different points.

- It initializes each block with a default value zero.

- It has two parameters or arguments as compared to malloc().

Syntax:

$Ptr = (\text{Cast-type}^*) \text{calloc}(n, \text{element size})$

$Ptr (\text{float}^*) \text{calloc}(25, \text{size of (float)})$;

(C) free() : ~

"free" method in C is used to dynamically de-allocate the memory. The memory allocated using functions malloc() and calloc() is not de-allocated by their own. Hence the free() method is used, whenever the dynamic memory allocation takes place. It helps to reduce wastage of memory by freeing it.

Syntax: ~

$\text{free}(ptr)$

(d) realloc() : ~

"realloc" or "re-allocation" method in C is used to dynamically change the memory allocation of a previously allocated memory. In other words, if the memory previously allocated with the help of malloc() or calloc() is insufficient realloc can be used to dynamically re-allocate memory. Re-allocation of memory maintains the already present value and new blocks will be initialized with the default garbage value.

Syntax:

realloc (Ptr, newsize)

Ptr is a pointer of Cst-type.

②. Code :

```
#include <stdio.h>
#include <stdlib.h>
```

```
int main()
```

```
{ int n, i, *arr1, *arr2;
```

```
printf("Enter number of elements");
```

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

```
arr1 = (int*) malloc (n * sizeof(int));
```

```
printf("Elements of array 1 are \n");
```

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

```
{ printf("%d \n", *(arr1 + i));
```

```
}
```

```
arr2 = (int*) realloc (arr1, (2 * n) * sizeof(int));
```

```
printf("Elements of array 2 are \n");
```

```
for (i = 0; i < 2 * n; i++)
```

```
{
```

```
printf("%d \n", *(arr2 + i));
```

```
}
```

```
return 0;
```

```
}
```

It is well known that `realloc()` creates new memory block and copies the value of the previous memory block into its new memory block.

So, if the size of the new block is greater than the size of the previous block then the previous block itself extends else a new block is allocated.

Here in my code in array number of elements is doubled then for first n elements the address will be same and for next other n elements address will change.