C Language

DMA

Saurabh Shukla (MySirG)

Agenda

1. SMA vs DMA
2. malloc()
3. Type Casting
4. calloc()
5. Memory Leak
6. free()
7. realloc()

SMA

Static Memory Allocation

```
int a;
float b;
char *p;
double d1;
struct Employee e1;
int A[5];
```

नाम होता है

Compile time

DMA

Dynamic Memory Allocation

malloc()

calloc()

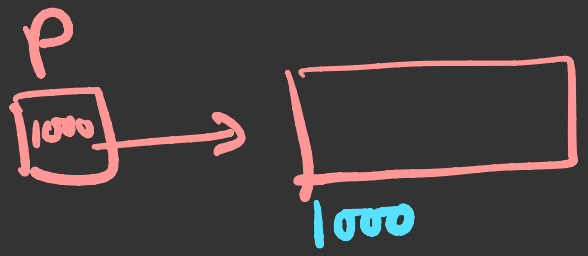
free()

कोई नाम नहीं होता

Runtime

malloc()

```
float *p;
p = (float*)malloc(4);
```



4 bytes

```
void* malloc (int s)
{
    return address
}
```

int *p;

Type casting

```
p = (int *)malloc(4);
```

calloc()

calloc (no. of var , sizeof var)

```
int *p;
p = (int*)calloc ( 5, 4);
```

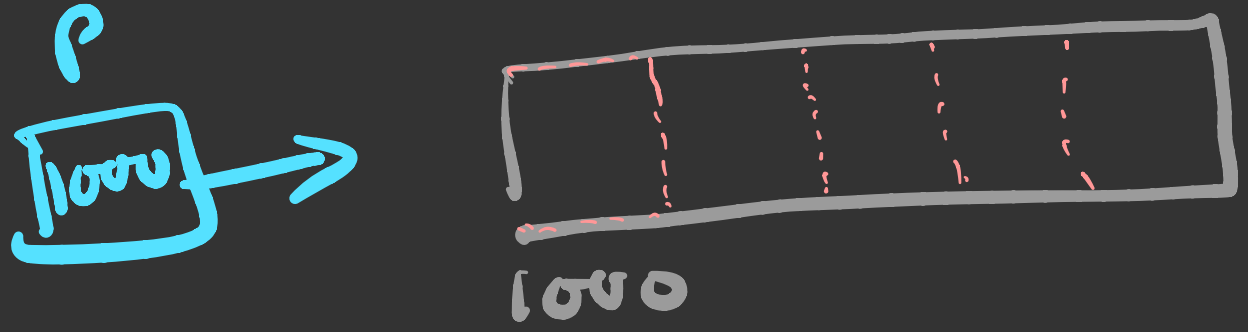
*(p + i)

p[i]

Malloc vs Calloc

	Malloc	Calloc
1	one argument	two arguments
2	Garbage value	0 zero
3	Single block	Array of blocks

```
int *p;
p=(int*) malloc(20)
```

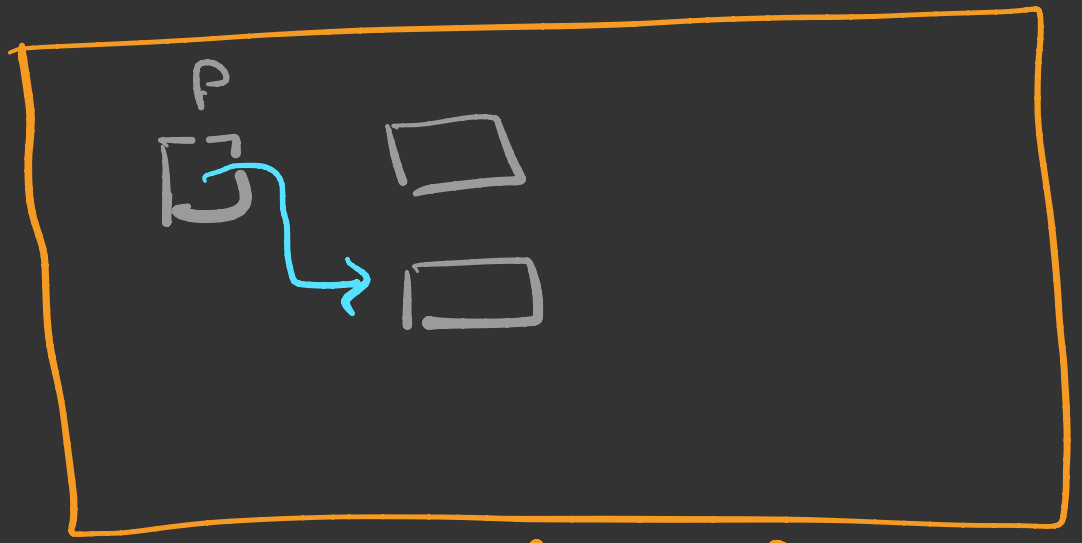


Memory Leak

```
int *p;
p = (int*)malloc(4);
```

≡

```
p = (int*) malloc(4);
```

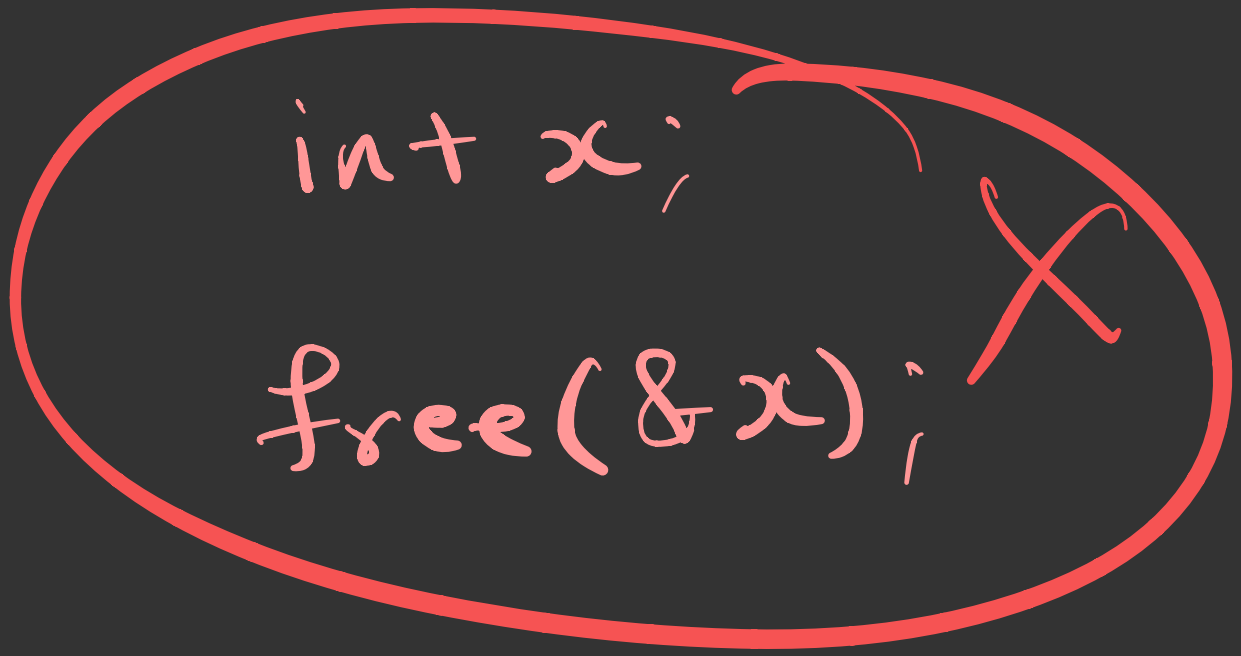


Total = Consumed + free

free( )

free function is used only to release Memory of DMA variables.

free( )



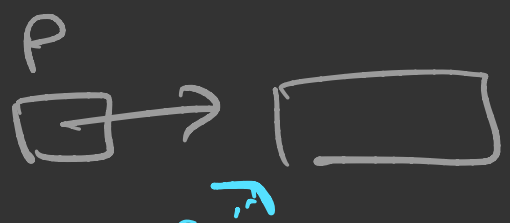
Two Options

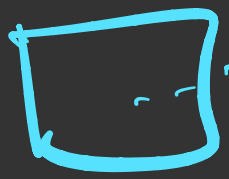
① Return address of DMA variable

```
int *q;
q = f1();
```

free()

```
int* f1()
{
    int *p;
    p = (int*) malloc(4);
    return p;
}
```





Two Options

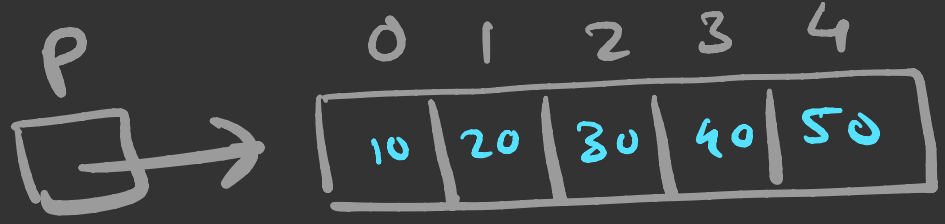
② free memory of DMA variable

```
f1()
{
    int *p;
    p=(int*)malloc(4);
    =
    =
    =
    =

    free(p);

}
```

realloc()

realloc(pointer, newsize)

```
int *p;
p = (int *) malloc(20);
```




```
p = realloc( p, 40);
```