C library macro - va_start()

Description

The C library macro **void va_start(va_list ap, last_arg)** initializes **ap** variable to be used with the **va_arg** and **va_end** macros. The **last_arg** is the last known fixed argument being passed to the function i.e. the argument before the ellipsis.

This macro must be called before using **va_arg** and **va_end**.

Declaration

Following is the declaration for va_start() macro.

```
void va_start(va_list ap, last_arg);
```

Parameters

- **ap** − This is the object of **va_list** and it will hold the information needed to retrieve the additional arguments with **va_arg**.

- **last_arg** − This is the last known fixed argument being passed to the function.

Return Value

NA

Example

The following example shows the usage of va_start() macro.

Live Demo

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

int sum(int, ...);

int main(void) {
   printf("Sum of 10, 20 and 30 = %d\n",  sum(3, 10, 20, 30) );
   printf("Sum of 4, 20, 25 and 30 = %d\n",  sum(4, 4, 20, 25, 30) );

   return 0;
}

int sum(int num_args, ...) {
```

```c
   int val = 0;
   va_list ap;
   int i;

   va_start(ap, num_args);
   for(i = 0; i < num_args; i++) {
      val += va_arg(ap, int);
   }
   va_end(ap);

   return val;
}
```

Let us compile and run the above program to produce the following result −

```
Sum of 10, 20 and 30 = 60
Sum of 4, 20, 25 and 30 = 79
```