**Mail Queue,**

* CMSIS-RTOS(os-prefix) is just a wrapper over the freeRTOS(x-prefix) functionality, using freeRTOS function gives you more freedom and customization over the functions
* CMSIS-RTOS allows you to use IOC to customize and build system which is more user friendly
* Using malloc with Mail queue
* **A screenshot of a computer

  Description automatically generated**

**Malloc usage**

* Malloc is used to define memory spaces in the heap, which mean they exsit/persist outside the scope of the functions call stack
* Typically variables compiled at runtime are done within a functions scope meaning that they are part of that functions memory space in stack memory , which does not exist after the function has completed/returned
* To have things persist outside the function, we use Dynamic Memory Allocation, ie. The heap, in which the programmer explicitly defines memory spaces using the **malloc** function
* Because the memory is allocated by the used, it must also be freed by the user using **osFree** in which the memory is now freed
* If memory is not freed it can cause **memory leak** in which too much memory is being used by the heap leaving not enough for the program causing bad behavior

**A screenshot of a computer

Description automatically generated**

* Cannot directly Assign an Array to another Array
* Must use strncpy

**Debugging**

* **Print out error message then call then have the Error\_Handler step in or just use Error handler to pass string into function and call Error\_Handler from there**