In C, variables can be categorized by their **storage duration** and **scope**

1. **Static Variables**  
   Allocated memory at compiled time and retain their value throughout the programme execution.  
   **1) Global Variables**  
    Declared outside funcitons.  
    Scope: Accessible from any functions in the file (or across files using extern).  
    Lifetime: Entire program runtime.  
    Stored in the data segment (initialized) or BSS ( unintialized).  
   **2) Local Variables** Declared inside functions with keyword **static.** Scope: The function where they are declared.  
    Lifetime: Entire programme runtime (**retain values between function calls**)  
    Stored in the **data segment**.  
   **Key Properties of Static Variables:**1) Memory is allocated once at compile time.  
   2) Default initialized to 0 (if uninitialized)  
   3) Not thread-safe by default.
2. **Dynamic Variables**Allocated memory at runtime using dynamic memory management function like **malloc.** Reside in the **heap** memory segment.  
     
   1) Lifetime: Persist until explicitly freed with free()  
   2) Scope: Accessed via pointers, fo depends on where the pointer is declared.  
     
   **Key Properties:**  
   1) Memory is allocated/deallocated at runtime.  
   2) No automatic initialization (contains garbage values unless cleared with calloc).  
   3) Risk of memory leaks if not freed.
3. **Automatic Variables**
4. **Register Variables**