Static Storage Allocation

- In static allocation, names bound to storage as the program is compiled, so there is no need for a run-time support package.

- Therefore, values of local names retained across activations of a procedure. That is when control returns to a procedure the value of the local are the same as they were when control left the last time.

- From the type of a name, the compiler decides amount of storage for the name and decides where the activation records go. At compile time, we can fill in the address at which the target code can find the data it operates on.
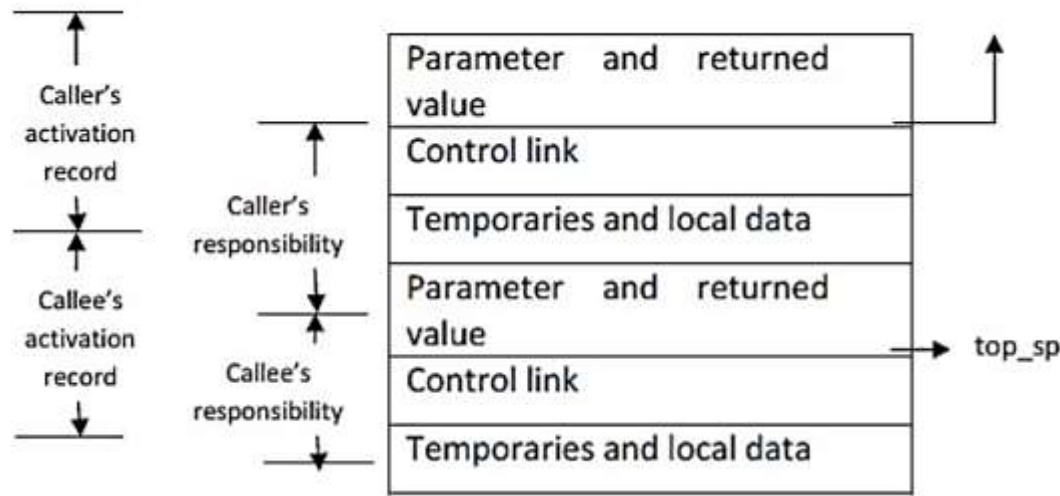
Stack Allocation of Space
/Temporary memory allocation

The calling sequence and its division between caller and callee are as follows

1. The caller evaluates the actual parameters.

2. The caller stores a return address and the old value of top_sp into the callee's activation record. The caller then increments the top_sp to the respective positions.

3. The callee-saves the register values and other status information.

4. The callee initializes its local data and begins execution.

Heap Allocation of Space

- <u>Stack allocation strategy cannot be used if either of the following is possible :</u>

- 1. The values of local names must be retained when an activation ends.

- 2. A called activation outlives the caller.

- Heap allocation is used to dynamically allocate memory to the variables and claim it back when the variables are no more required.

- Memory area may be deallocated in any order, so over the time the heap will consist of alternate areas that are free and in use.

The record for an activation of procedure r is retained when the activation ends. Therefore, the record for the new activation q(1 , 9) cannot follow that for s physically. If the retained activation record for r is deallocated, there will be free space in the heap between the activation records for s and q

Position in the activation tree	Activation records in the heap	Remarks
s r q (1 , 9)	s *control link* r *control link* q(1,9) *control link*	Retained activation record for r