RUN TIME STORAGE ORGANIZATION

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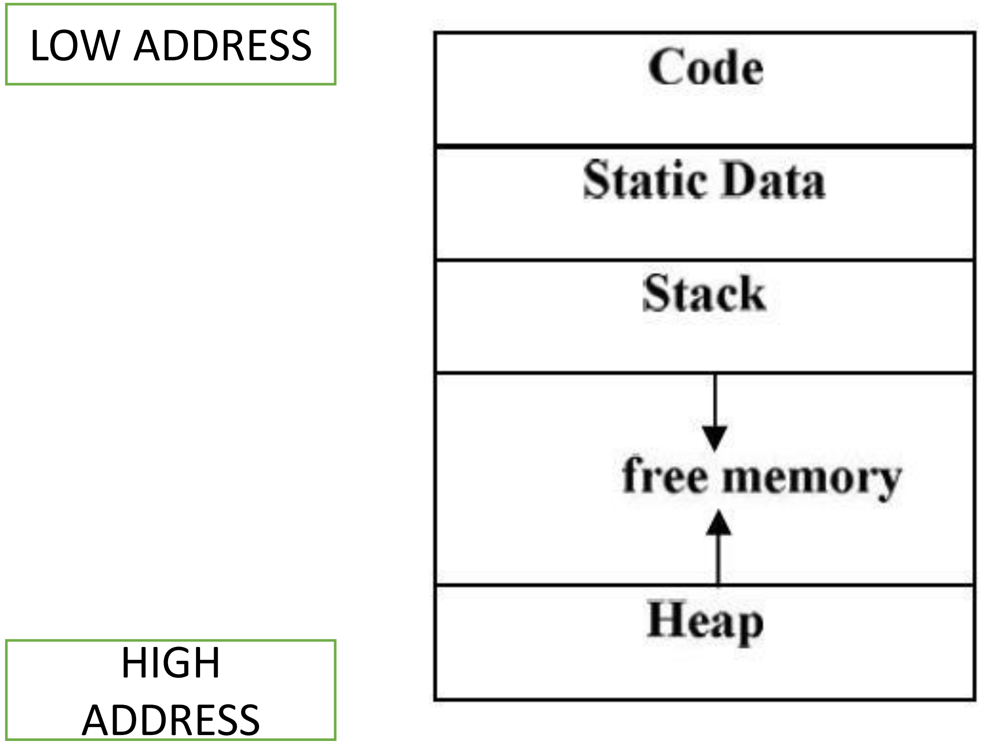
Typical subdivision of run time memory



RUN TIME STORAGE ORGANIZATION

- **Code area**: used to store the generated executable instructions, memory locations for the code are determined at compile time.
- **Static Data Area**: Consist of static and global variables.
- **Stack Area**: Used to store the Automatic data object allocated at runtime,. eg. Activation records
- Generally used when the code consist of large no: of procedures.
- It is LIFO structure used to hold information about each instantiation.
- Procedure calls and returns are usually managed by a run time stack called control stack.
- Each live activation has an activation record on control stack, with the root of the activation tree at the bottom, the latter activation has its record at the top of the stack
- The contents of the activation record vary with the language being implemented

Activation record

RUN TIME STORAGE ORGANIZATION

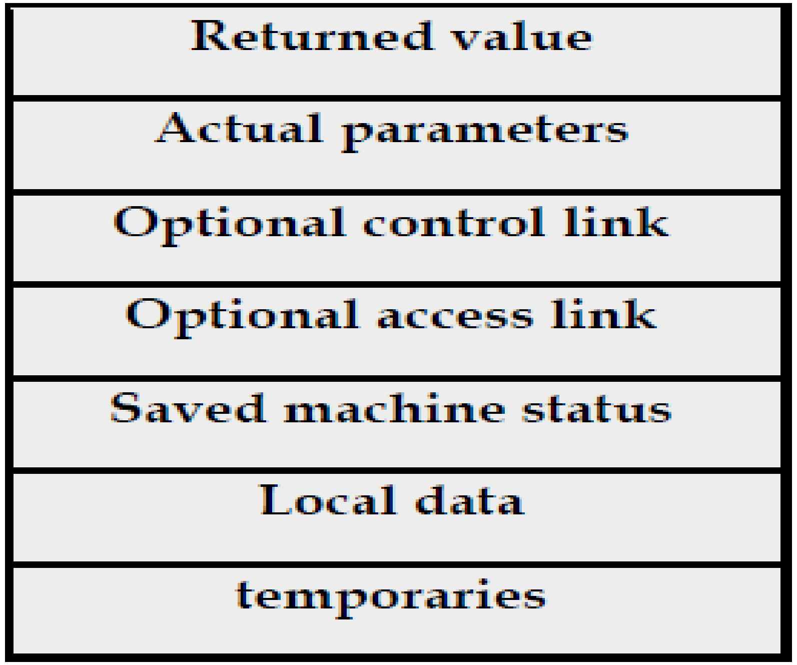
- **Heap**: Used to store other dynamically allocated data objects at

  runtime (for ex: malloac)

  used in the case of pointer variables.
- This runtime storage can be subdivided to hold the different components of an existing system
- 1. Generated executable code
- 2. Static data objects
- 3. Dynamic data objects-heap
- 4. Automatic data objects-stack

RUN TIME STORAGE ORGANIZATION

- **ACTIVATION RECORD**



Returned value

Actual parameters

Optional control link

Optional access link

Saved machine status

Local data

temporaries

General Activation Record

RUN TIME STORAGE ORGANIZATION

- **ACTIVATION RECORD**
- **Returned Value**

The field for the returned value is used by the called procedure to return a value to the calling procedure.

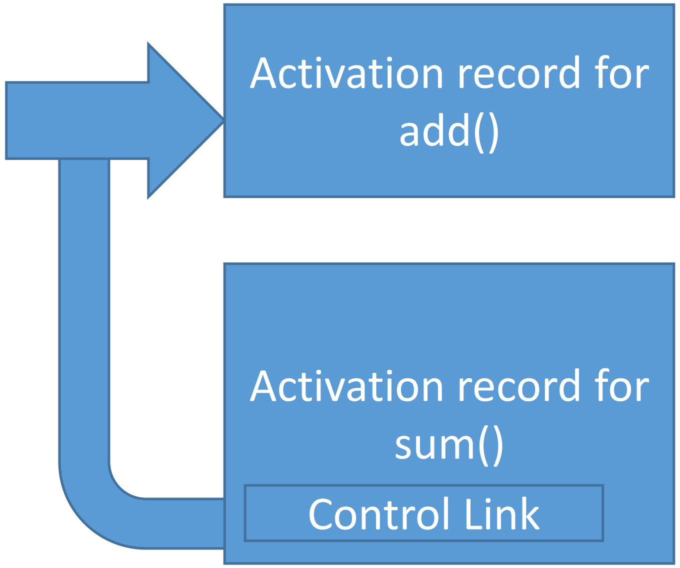
```
   add()//calling procedure
   { a=sum()
             }
sum() //called procedure
 {
          }
```

RUN TIME STORAGE ORGANIZATION

- **ACTIVATION RECORD**

- **Optional Control Link**
- The optional control /ink paints to the activation record of the caller

```
     add()//calling procedure
     { a=sum()
               }
  sum() //called procedure
   {
             }
```



Activation record for add()

Activation record for sum()

Control Link

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- **Actual paramaters:** The field for actual parameters is used by the calling procedure to supply parameters to the called procedure.
- **Optional Access Link :** The optional access link is used to refer to local data

  of called function but held in another activation records.
- **Temporary Data:** Temporary values, such as those arising in the evaluation of expressions, are stored in the field for temporaries.
- **Local Data** :The field for local data holds data that is local to an execution of a procedure.
- **Saved Machine Status:** It holds information about the state of the machine just before the procedure is called.The address of next instruction to be executed is stored in program counter.