Structured Event Scheduling

- In the event scheduling method, a global future event data structure controls the simulation, while individual block elements submit events to occur to the data structure.
- The “occurrence” of an event means to execute an event routine which handles the semantics associated with that event.
- **Basic cycle for an event scheduling**

![Diagram](image-url)

1. An event is removed from the head of the future event list
2. The routine corresponding to this event is now in "control"
3. The event routine will schedule other events
• The key operations to the data structure
  o Enqueue: insert a time-tagged event into the data structure so that the structure maintains its ordered sequence
  o Dequeue: delete the event in the data structure that has the minimum time
  o Cancel: cancel the event in the data structure with a specified time or event identification
• Three major categories of data structure: list, tree and table
• Linear list method: linked list and array
• Tree method
  o Binary search tree
- Heap

- Dynamic hashing: see additional note
Algorithm for Dynamic Hashing Operation

Procedure HashEnqueue(X)
   Hash to the appropriate bucket using a modulus
   and a hashing function applied to X
   Double the hash table size if the number of events
   is greater than 2 * number of buckets
End HashEnqueue

Procedure HashDequeue
   Search all buckets for the event with the minimum time
   (make sure that time is within the current year)
   If no events are found for this year (a year of empty buckets),
   then take the minimum time event
   Remove the item from the table
   Halve the hash table size if the number of events
   is less than 0.5 * number of buckets
End HashDequeue

Procedure HashCancel(X)
   Hash to appropriate bucket by applying the hashing function to X
   Locate X and remove it from the bucket list
End HashCancel