**NARS in Python – Technical Documentation**

**Object Classes and Data Structures**

**Task**A Task can be *input* or *derived*. Derived Tasks contain sentences which have 2 or more pieces of evidence in its evidential base.

Each Task has a Stamp, which contains the Task’s metadata.

**Concept***Conceptualizing* is the process of creating a new Concept, which is named by a term.

Each Concept contains:

* A belief Table holding processed *judgments* about the Concept. Atomic Concepts (that contain no copula) will have empty belief tables, but will be term-linked to Statement Concepts.
* A desire Table holding processed *goals* about the Concept. Atomic Concepts (that contain no copula) will have empty desire tables, but will be term-linked to Statement Concepts.
* A dictionary of *task-links*.
* A dictionary of *term-links*.

**Tables**Tables (belief table and desire table) are stored in Concepts. They are Max Heaps that store Narsese Sentences sorted by Confidence. When the Table overflows, the Sentence with the lowest Confidence is purged.

**Bag**The Bag consists of an array of buckets (1-100), and a pointer that points to the currently selected bucket. Objects can be placed into the bag, where they are first wrapped inside a Bag Item with a Priority value, and then inserted into the corresponding bucket based on Priority.

When an item is to be randomly removed from the bag:

* The pointer moves to the next non-empty bucket
* A random number is generated
* If the random number passes the bucket’s probability threshold, an item is removed randomly (uniformly) from the bucket. Otherwise, the pointer moves to the next non-empty bucket.
* This process is repeated until an item is removed.

Items are also stored inside a lookup table, where the key is the hash of the Bag Item’s contained object. *Concept* data structure is defined so its hash is simply the hash of its term; in this way, Concepts can be directly selected from the bag using the term.

**Buffer**TBD

**Algorithms**

**Main Control Loop:**

The system either *Observes* a task from its experience buffer, or it *Considers* a Concept from its Memory. The proportion of time the system spends on either process depends on a system parameter, its *Mindfulness*.

**Task Processing:***Initial processing* occurs the first time a task is selected.

*Continued processing* occurs after initial processing, and subsequently whenever the task is selected again.

* **Judgment:**
  + *Initial Processing*
    1. The Judgment’s immediate subterms (subject and predicate) are conceptualized.
    2. The Judgment itself is conceptualized, and bidirectionally term-linked to its subject and predicate concepts.
    3. The Judgment is added directly to the belief table.
    4. **END PROCESSING**
  + *Continued Processing*
    1. First, the Judgment’s corresponding Concept is activated.
    2. Then, a related belief is accepted from the current Concept (Local Inference: *Revision*) or a related Concept (Forward Inference: *Deduction*)
    3. TBD
* **Question:**
  + *Initial Processing*
    1. First, the Question’s corresponding Concept is activated.
    2. Get an answer to the question, by peeking at the highest-confidence belief in the Concept’s belief table.
    3. If the task is an *input* task, the answer is printed as OUTPUT from NARS.
  + *Continued Processing*
    1. TBD
* **Goal:**
  + *Initial Processing*
    1. TBD
  + *Continued Processing*
    1. TBD