**Assumptions**

1. Two layer model: The model consists of two layers an input feature layer, and a category layer.
   1. Inputs
      1. The input feature layer consists of a binary valued list of features.
      2. Features are connected to categories by feature weights.
      3. Feature weights are assigned/updated after viewing feedback after categorization attempts. (see update functions for more). All feature weights (for the category for which feedback was received) are updated.
   2. Competitive Categories (for decisions)
      1. Categories are independent binary values.
      2. A “learner” may have as many categories as need be.
      3. For assessment purpose, categories are considered independent of one another.
      4. For output purposes, categories compete against one another.
      5. Categories are initially weighted independently (As a multiplicative function of feature weights, where weights represent independent likelihoods of features, given the category in question), but compete for outpute, where competition takes the form of a weighted probability distribution (Boltzmann distribution).
2. Update Functions
   1. The update functions are a modified (Hierarchical Bayesian) form of Rescorla-Wagner type prediction error learning.
   2. The (implicit) psychological assumption in the hierarchical form is that learners not only infer feature-category mappings from the data, they also infer the statistical strength of these mappings (variance in strength of mapping over time) and possible changes in mappings (parameterized by inferred volatility of mapping (variance of the variance- of mappings)). Briefly, this suggests that individuals are sensitive not just to feature-category identification, but changes in feature-category mappings, and the (possible) rate/frequency of these changes. This reflects a broader psychological assumption that learners do not necessarily learn “only” what’s in front of them, but infer deeper features (“changes in changes”) over time.
   3. Individual differences in priors may reflect endogenous individual differences. (For example, the priors on variance in the update function might correspond to latent inhibition, and the coupling constant might capture some notion of cognitive flexibility).
   4. Updates follow Kahneman’s suggested, “what you see is all there is” principle: Only the category on which a learner receives feedback is updated.
   5. See “A Bayesian Foundation for Individual Learning Under Uncertainty”. by Christoph Mathys,1,2,\* Jean Daunizeau,1,3 Karl J. Friston,3 and Klaas E. Steph. For further details.
3. **Major “take home” points/assumptions.**
   1. Model is two layered, separated between feature and category layers (combined with/follwed by a competitive decision function).
   2. Categories are first weighted independently, then compete for meaning.
   3. Points A and B suggest that Category definitions can share Parts, but that output (category decision) is mutually exclusive. (By analogy to speech production or motor movement: the space of possible sentences (or movements) conditional on a prior movement or utterance is large, but one can only select a single word or movement to follow the word just uttered (or movement performed)).
   4. “What you see is all there is”. Updates only occur for the category that feedback was received on.
   5. Update functions reflect not just inferences about feature/category mappings, but also changes in feature-category mappings.
   6. Individual differences included in update functions.