## BaseAlgorithm

- Eigen::MatrixXd data
- std::shared ptr<AbstractMixing> mixing
- bayesmix::AlgorithmState curr\_state // Used by Collector
- std::vector<unsigned int> allocations
- std::vector<std::shared\_ptr<AbstractHierarchy>> unique\_values

## BaseMixing and AbstractMixing

- num components // Used only by the Stick Breaking mixings
- std::shared\_ptr<google::protobuf::Message> prior

## DirichletMixing

- State state // State is a struct that contains totalmass and logtotalmass
- + mass exisiting cluster() // Computes n/ \alpha+n
- + mass new cluster () // Computes \alpha / (\alpha + n)

## BaseHierarchy and AbstractHierarchy

- std::shared ptr<Hyperparams> hypers
- Hyperparams posterior\_hypers
- std::shared ptr<Prior> prior
- std::set<int> cluster data idx // Set of indexes of data points belonging to this cluster
- int card // Current cardinality of this cluster
- double log card // Logarithm of card
- + add datum() // Add datum to the cluster
- + remove datum ( ) // Remove datum from the cluster
- + get\_like\_pdf( ) // Likelihood of single datum, where the parameters are taken from MLE based on data
- + like Ipdf grid() // Same as above, but with a grid of points
- + prior pred lpdf( ) // Computes the predictive probability based on the prior
- + conditional pred lpdf( ) // Computes the predictive probability based on the posterior
- + prior pred lpdf grid() // Same as above, but in a grid of points
- + conditional pred lpdf grid() // Same as above, but in a grid of points
- + sample prior() // Sample from P 0
- + sample\_full\_cond( ) // Sample \theta from the full conditional