



3. Aggregation of marker similarities using an exact binomial test

Firstly, the weighted number of success x and the weighted number of trials w are calculated using these two formulas:

$$x = \sum_{i=1}^n \text{trial}_i \times \text{weight}_i \quad w = \sum_{i=1}^n \text{weight}_i$$

where

trial_i is equal to **0** iff the trial **fail** for marker _{i} or else is equal to **1** iff the trial **success** for marker _{i} . Those marker trials will then correspond to success or fail in a Bernoulli experiment.

Secondly, using x and w , an exact right-tailed binomial test is performed between the null hypothesis defined by the probability of success P (provided by the user) and the observed number of success x in the w number of trials. A low p-value can then be interpreted as a high proportion of marker successes corresponding to similar cell clusters.

Moreover, an aggregated similarity measure is computed using the following formula:

$$D = \sum_{i=1}^n D_i \times \text{weight}_i$$

where

D_i correspond to the similarity measure for marker _{i} .