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Some constructions on multi-type branching trees

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Branching processes comprise a popular topic in probability, having several applications in other areas of mathematics and natural sciences. It is possible to construct a branching tree recursively using its offspring probability generating function. Geiger, Lambert and Popovic have described methods of constructing these random trees backwards starting at the present time. We generalize some of their results and constructions to the context of multi-type branching processes. This construction is then used to determine various statistical properties of the ancestral tree of the standing population, e.g. the time to the most recent common ancestor (MRCA) of individuals of different types and times of MRCAs of individuals of the same type.

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