# *Cases for finding the solutions of recurrence equations based on the roots of the characteristic equation*

***Case 2: –roots of the characteristic equation are not distinct:***

***If the roots are not distinct , then let there be roots `r` with multiplicity of `m`.***

***In such a case, solutions of the characteristic equation, $t_n = r^n, t_n = nr^n, t_n = n^2r^n, \dots, t_n = n^{m-1}r^n$, are all solutions of the recurrence equation. Therefore , a term for each of these should be included in the final general solution.***

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