$z_1, z_2, \ldots\ldots, z_M$

where $M = \sum_{i=0}^{n} m_i$. Then, we can write the interpolating polynomial in the form

$$P(x) = f[z_0] + \sum_{k=1}^{M} f[z_0, .., z_k](x-z_0)\ldots(x-z_{k-1})$$

Ex. Find a polynomial of degree 3 such tha[t]

$P(x_0) = f_0 \quad P'(x_0) = f_0' \quad P''(x_0) = f_0'' \quad P'''(x_0) = f_0'''$

Thus, we have the points

x_0, x_0, x_0, x_0

x		I^{st} DD	II^{nd} DD	III^{rd} DD
x_0	f_0			
x_0	f_0	f_0'		
x_0	f_0	f_0'	$\frac{f_0''}{2!}$	
x_0	f_0	f_0'	$\frac{f_0''}{2!}$	$\frac{f_0'''}{3!}$

$$P(x) = f_0 + f_0'(x-x_0) + \frac{f_0''}{2!}(x-x_0)^2 + \frac{f_0'''}{3!}(x-x_0)^3$$

Thus, Taylor's polynomial is a special case of Hermite Interpolation