$L_{n,k}(x)$ for each $k = 0, 1, \ldots, n$
with properties

$$L_{n,k}(x_i) = 0 \quad \text{if } i \neq k$$

$$L_{n,k}(x_k) = 1$$

A polynomial of degree n which is zero at the points

$$x_0, x_1, \ldots, x_{k-1}, x_{k+1}, \ldots, x_n$$

is

$$(x-x_0)(x-x_1)\ldots(x-x_{k-1})(x-x_{k+1})\ldots(x-x_n)$$

To satisfy $L_{n,k}(x_k)=1$ we must divide by the value of this polynomial at $x = x_k$
Thus,

basis polynomial $\rightarrow$ $$L_{n,k}(x) = \frac{(x-x_0)(x-x_1)\ldots(x-x_{k-1})(x-x_{k+1})\ldots(x-x_n)}{(x_k-x_0)(x_k-x_1)\ldots(x_k-x_{k-1})(x_k-x_{k+1})\ldots(x_k-x_n)}$$

Let $P(x)$ be a polynomial of degree n satisfying

$$P(x_k) = f_k \qquad k = 0, 1, \ldots, n$$

then

$$P(x) = f_0 L_{n,0}(x) + \ldots + f_n L_{n,n}(x) = \sum_{k=0}^{n} f_k L_{n,k}(x)$$