The mapping formula for general k is obtained using the same reasoning as used in xercise 7. The formula is

$$map(i_1, i_2, \cdots, i_k) = i_1 u_2 u_3 \cdots u_k + i_2 u_3 \cdots u_k + \cdots + i_{k-2} u_{k-1} u_k + i_{k-1} u_k + i_k$$

Notice that

$$map(i_1, i_2, \cdots, i_k) = map(i_1, \cdots, i_{k-1}) * u_k + i_k$$

for $k > 1$.