

```
01 void upgrade(__mmask16 m, __m512 f0, __m512 f1,  
02             __m512 *lo, __m512 *hi)  
03 {  
04     __mmask16 c_f0z = _mm512_cmpeq_ps_mask(f0, z0);  
05     __mmask16 c_f0n = _mm512_cmpltn_ps_mask(f0, z0);  
06     __mmask16 c_f0p = ~(c_f0z | c_f0n);  
07     __mmask16 c_f1p = _mm512_cmpltn_ps_mask(z0, f1);  
08     __m512 k = _mm512_mask_div_ps(k, ~(m & c_f0z), f1, f0);  
09  
10     k = SUB(z0, k);  
11     *lo = _mm512_mask_add_ps(*lo, m & c_f0z & c_f1p, *hi, z1);  
12     *hi = _mm512_mask_min_ps(*hi, m & c_f0p, *hi, k);  
13     *lo = _mm512_mask_max_ps(*lo, m & c_f0n, *lo, k);  
14 }
```