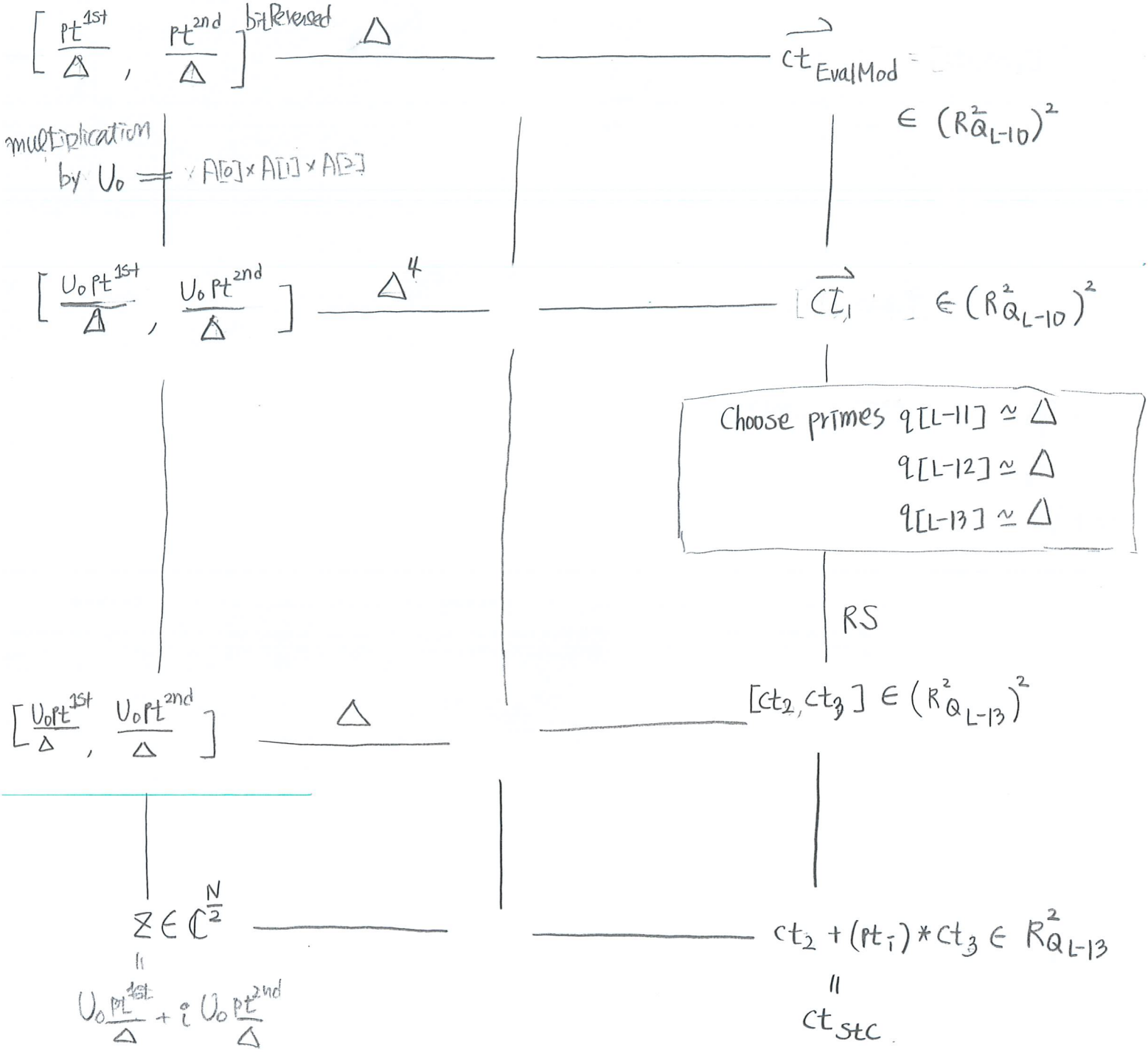
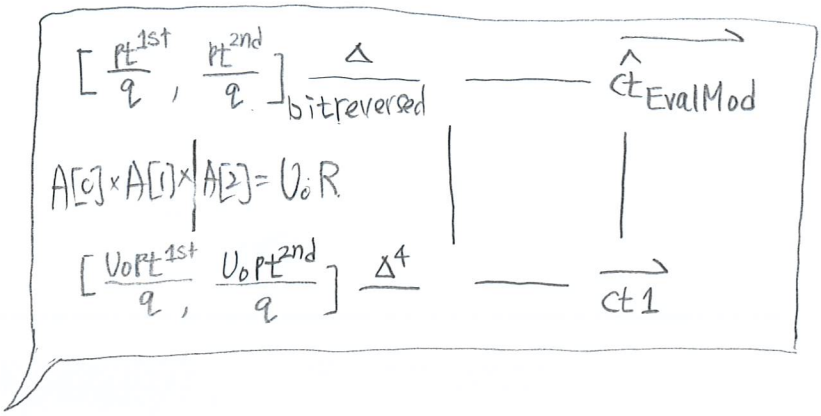
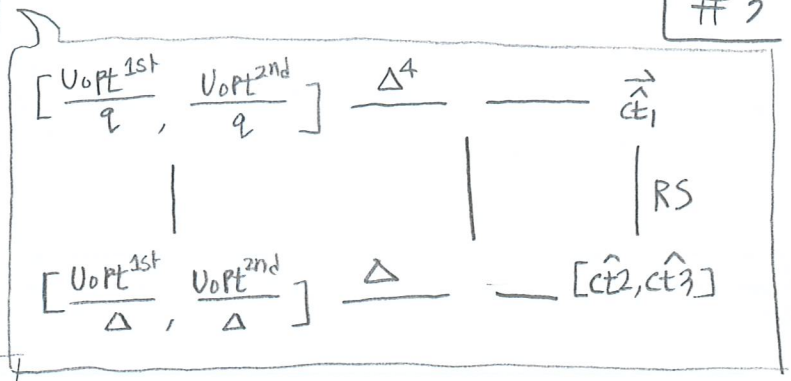
<SlotToCoeff>



```
template <int L, int DNUM, int K>
void SlotToCoeff_logN_10 (const uint64_t q[L],
                          const uint64_t P[K], uint64_t Delta,
                          const SparseComplexMatrix <1<<9, 2η> A[3],
        const uint64_t rkey[3][2η][DNUM][2][DNUM*K+K][1<<10],
        const uint64_t ct_EvalMod [2][2][ L ][1<<10],
              uint64_t ct_stc     [2][L-3][1<<10] ) {
const N = 1<<10;
uint64_t ct1 [2][2][L][N];
for (int i=0; i<2; i++)
for (int j=0; j<2; j++)
for (int k=0; k<L; k++)
for (int w=0; w<N ; w++)
    ct1[i][j][k][w] = ct_EvalMod [i][j][k][w];
for(int n=2; n>=0; n--) {
    uint64_t temp [2][2][L][N] ;
    for(int i=0; i<2; i++)
      linearTransformation <N,10,L,DNUM,K,2η> (A[n], Delta, q, P, rkey[n],
                                               ct1[i], temp[i] );
    for(int i=0; i<2; i++)
    for(int j=0; j<2; j++)
    for (int k=0; k<L; k++)
    for (int w=0; w<N; w++)
        ct1[i][j][k][w] = temp[i][j][k][w]
}
```



```
uint64_t ct2[2][L-3][N];
uint64_t ct3[2][L-3][N];
RS_hat<N,L,L-3>(q, ct1[0], ct2);
RS_hat<N,L,L-3>(q, ct1[1], ct3);
```

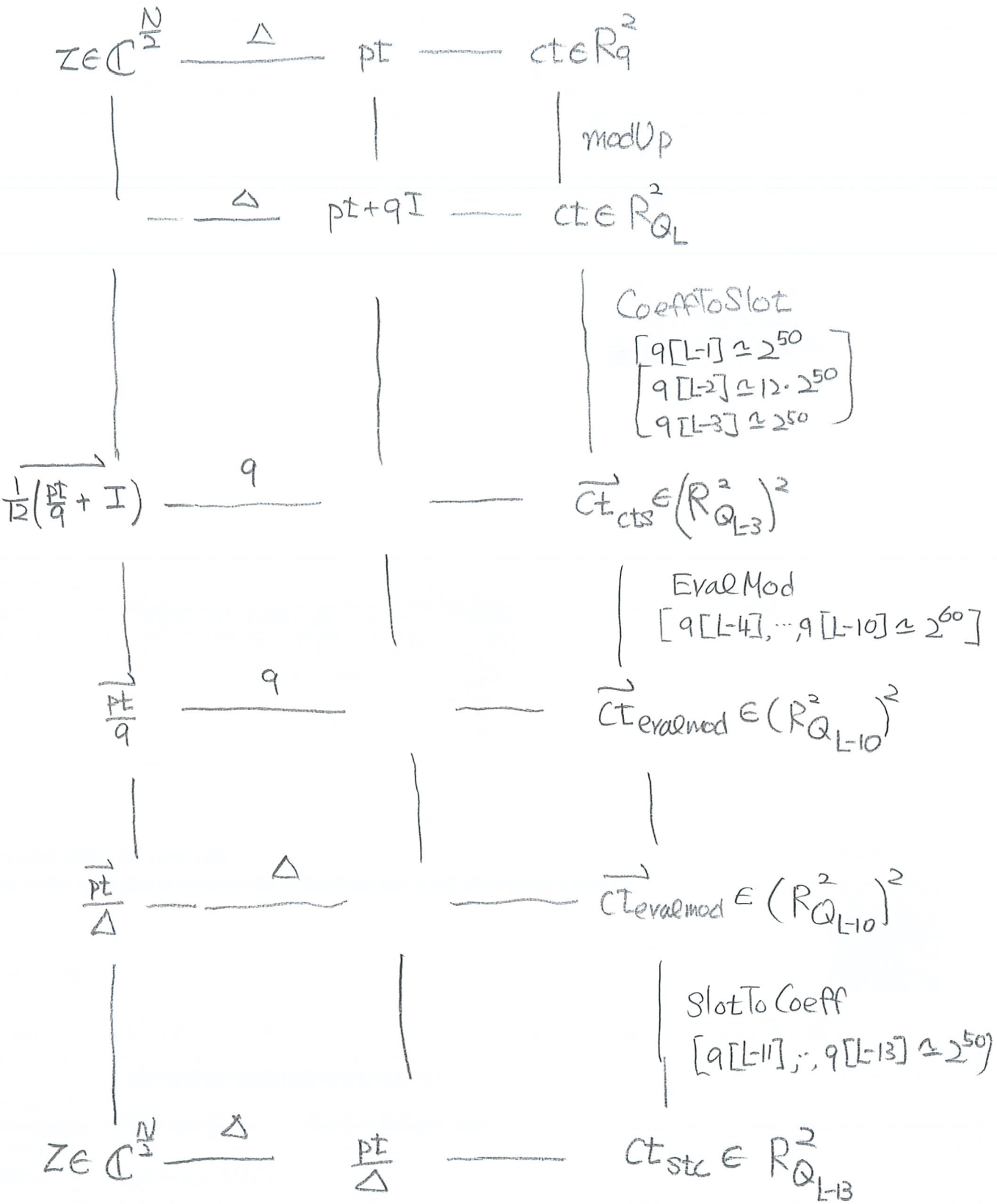



```
uint64_t Pt[L-3][N];
for(int i=0; i<L-3; i++) {
    for(int j=0; j<N; j++) Pt[i][j] = 0;
    Pt[i][N/2] = 1;
}
ntt<N,L-3>(q, Pt);
```

$i \in \mathbb{C}^{\frac{N}{2}}$ — 1 — $\hat{Pt}_i \in \mathbb{Z}_Q$ = $X^{\frac{N}{2}}$

```
for(int i=0; i<2; i++)
for(int j=0; j<L-3; j++)
for(int k=0; k<N; k++) {
    ct_stc[i][j][k] = (ct2[i][j][k] + mul_mod(Pt[j][k], ct3[i][j][k], q[j])) % q[j];
}
```

$\hat{ct}_{stc} = \hat{ct}_2 + (\hat{Pt}_i) * \hat{ct}_3$


$z \in \mathbb{C}^{\frac{N}{2}}$
Δ
pt
$ct \in R_q^2$
modUp
Δ
$pt + qI$
$ct \in R_{Q_L}^2$
CoeffToSlot
$[q_{[L-1]} \simeq 2^{50}$
$q_{[L-2]} \simeq 12 \cdot 2^{50}$
$q_{[L-3]} \simeq 2^{50}]$
$\frac{1}{12}(\frac{pt}{q} + I)$
q
$\vec{ct}_{cts} \in (R_{Q_{L-3}}^2)^2$
EvalMod
$[q_{[L-4]}, \cdots, q_{[L-10]} \simeq 2^{60}]$
$\frac{pt}{q}$
q
$\vec{ct}_{evalmod} \in (R_{Q_{L-10}}^2)^2$
$\frac{\vec{pt}}{\Delta}$
Δ
$\vec{ct}_{evalmod} \in (R_{Q_{L-10}}^2)^2$
SlotToCoeff
$[q_{[L-11]}, \cdots, q_{[L-13]} \simeq 2^{50}]$
$z \in \mathbb{C}^{\frac{N}{2}}$
Δ
$\frac{pt}{\Delta}$
$ct_{stc} \in R_{Q_{L-13}}^2$