**Remark 1.** $C_*(\mathcal{C})$ does not have enough projective objects.

**Theorem 2.** *The sequence of functors* $\{H_i\}_{i=0}^{\infty}$ *gives us a* universal $\delta$-functor *(takes short exact sequences to long exact sequences), i.e. if we have another sequence* $T_i$ *such that* $T_0 = H_0$*, then* $\forall_i H_i^* = T_i^*$.

**Lemma 3.** *For a given* $C_* \in C_*(\mathcal{C})$ *there exists* $P_* \twoheadrightarrow C_*$ *such that* $H_i(P_*) = 0$ *for* $i > 0$.

**Remark 4.** If $p + q = n$, let $f_{pq} : X_{nn} \to X_{pq}$ be defined as $d_{p+1}^h \circ \ldots \circ d_n^h \circ d_0^v \circ \ldots \circ d_0^v$, and then the Alexander-Whitney map $\sum_{p+q=n} f_{pq} : X_{nn} \to \bigoplus_{p+q=n} X_{pq}$ gives a chain homotopy equivalence of $k(X_{pp})$ and $\mathrm{tot}(kX_{pq})$.

**Remark 5.** We may take a projective simplicial resolution $P_*$ of $A$ of degree $n > i$, then $L_i^s T(A) = H_{n+i}(T(P_*))$.

**Theorem 6.** $\deg L_i T(\bullet, n) \leqslant \lfloor \frac{i}{n} \rfloor$.

**Remark 7.** Or theorem? Or proof? It is written that
$T((A, n) \oplus (B, n)) = T(A, n) \oplus T(B, n) \oplus V$ where $V$ is trivial below $2n$.

**Proposition 8.** $\forall_i\, L_i^s T$ *is an additive functor.*

**Proposition 9.** *Let* $0 \to A \to B \to C \to 0$ *be exact in* $\mathcal{C}$*. Then we have a long exact sequence* $\ldots \to L_{q+1}^s T(C) \to L_q^s T(A) \to L_q^s T(B) \to L_q^s T(C) \to \ldots$.

**Proposition 10.** *If* $0 \to T' \to T \to T'' \to 0$ *is an exact sequence of functors, then we have a long exact sequence of functors* $\ldots \to L_{i+1}^s T'' \to L_i^s T' \to L_i^s T \to L_i^s T'' \to \ldots$.

**Proposition 11.** *Let* $U$ *be an additive functor, then for any functor* $T$ *we have*
$\mathrm{Hom}_{sth}(T, U) \simeq \mathrm{Hom}_{sth2}(L_0^s T, U)$.