Preliminary problems. These should be submitted to Gradescope before Thursday discussion.

(P1) Consider the complexes

$$C_\bullet : \qquad 0 \longrightarrow \mathbb{Z} \xrightarrow{\text{Id}} \mathbb{Z} \longrightarrow 0$$

and

$$D_\bullet : \qquad 0 \longrightarrow \mathbb{Z} \xrightarrow{\ 0\ } \mathbb{Z} \longrightarrow 0.$$

(a) Locate 2 different morphism $C_\bullet \to D_\bullet$ of complexes (you are encouraged to be creative).

(b) Locate a pair of group homomorphisms $f, g : \mathbb{Z} \to \mathbb{Z}$ so that

$$
\begin{array}{ccccccccc}
C_\bullet : & & 0 & \longrightarrow & \mathbb{Z} & \xrightarrow{\text{Id}} & \mathbb{Z} & \longrightarrow & 0 \\
& & & & \downarrow{\scriptstyle f} & & \downarrow{\scriptstyle g} & & \\
D_\bullet : & & 0 & \longrightarrow & \mathbb{Z} & \xrightarrow{\ 0\ } & \mathbb{Z} & \longrightarrow & 0.
\end{array}
$$

is **not** a morphism of complexes.