

**Worksheet 4**  
**Predicate Logic**

1. Use quantifiers to express each of these statements.
  - (a) Someone walks and talks.
  - (b) Someone walks and someone talks.
  - (c) Everyone who walks is calm.
  - (d) Everyone who sees Mary loves Mary.
  - (e) If anyone cheats, everyone suffers.
2. Given  $C(x)$ :  $x$  is a DBM2033 student and  $L(x)$ :  $x$  loves music. Express the quantifications in English sentences.
  - (a)  $\forall x L(x)$
  - (b)  $\forall x \sim L(x)$
  - (c)  $\exists x L(x)$
  - (d)  $\forall x (C(x) \rightarrow L(x))$
  - (e)  $\exists x (C(x) \wedge L(x))$