Ms. Grace Hajjar
Exercise 11.3 (f)

Let $U = \mathbb{R}$.

Claim: $0 < 1$

Proof: Assume the premises.
We note $0 \neq 1$ from the axiom of the multiplicative identity.

1. Suppose $0 \geq 1$
2. $0 > 1$ or $0 = 1$

Case A: 0 = 1

3A. $0 = 1$	3A. Cases
4A. $0 \neq 1$	4A. Axiom of existence of multiplicative inverse
5A. $0 = 1$ and $0 \neq 1$	5A. Adjunction. So we have a contradiction of the trichotomy law.

Case B: 1< 0

3B. $1 < 0$	3B. Cases
4B. $1+ (-1) < 0+ (-1)$	4B. Axiom of preservation of order under addition
5B. $0 < 0+ (-1)$	5B. Axiom of Additive inverse
6B. $0 < -1$	6B. Axiom of Additive identity
7B. So, -1 is positive	7B. By the definition of positive Reals
8B. $0(-1) > (-1)(1)$	8B. Axiom of preservation of order under a pos. mult.
9B. $0 > (-1)(1)$	9B. Lemma 2
10B. $0 > -1$	10B. Axiom of identity of multiplication
11B. $-1 > 0$ and $0 > -1$	11B. Adjunction. So we have a contradiction of the trichotomy law.

Thus, $0 < 1$

QED