1 Monotonicity

Assume the following lexical entries:

(1) a. $[\![\text{a}]\!]^{a,M} = [\lambda g \in D_{\langle e,t\rangle}.[\lambda f \in D_{\langle e,t\rangle}.\ 1 \text{ iff } \mathsf{set}(f) \cap \mathsf{set}(g) \neq \varnothing]]$

b. $[\![\text{at most five}]\!]^{a,M} = [\lambda g \in D_{\langle e,t\rangle}.[\lambda f \in D_{\langle e,t\rangle}.\ 1 \text{ iff } |\mathsf{set}(f) \cap \mathsf{set}(g)| \leqslant 5]]$

c. $[\![\text{exactly five}]\!]^{a,M} = [\lambda g \in D_{\langle e,t\rangle}.[\lambda f \in D_{\langle e,t\rangle}.\ 1 \text{ iff } |\mathsf{set}(f) \cap \mathsf{set}(g)| = 5]]$

d. $[\![\text{More than 20\% of the}]\!]^{a,M} = [\lambda g \in D_{\langle e,t\rangle}.[\lambda f \in D_{\langle e,t\rangle}.\ 1 \text{ iff } \dfrac{|\mathsf{set}(f) \cap \mathsf{set}(g)|}{|\mathsf{set}(g)|} > 0.2]]$

For each of the these quantifiers, indicate its monotonicity properties by completing the following table. The choices are *Up (↑), Down (↓)* or *Non-monotonic (N)*. Motivate your answers with data showing entailment patterns (no need for formal proofs, which are left for the optional exercise).

	LEFT	RIGHT
every	↓	↑
a		
at most five		
exactly five		
more than 20% of the		

2 (Optional) Proofs

For each of your answers in Exercise 1 that is ↑ or ↓, give a proof.