

## In-Class Assignment DFF2: Terra Reflexive Math

**Context.** On May 7, 2022, TerraUSD (UST) traded at \$18B in circulating supply, backed by the reflexive “burn \$1 LUNA to mint 1 UST” mechanism with a LUNA market cap of \$40B. The protocol has no exogenous collateral: UST redemption directly inflates LUNA supply. Assume 5 sequential rounds, each round 10% of remaining UST holders redeem at \$1 for newly-minted LUNA, then immediately sell that LUNA on the open market. Assume LUNA market cap falls proportionally to the dilution ratio (linear, for simplicity; the real dynamic is more violent).

**Q1.** Compute the **UST and LUNA stock at the end of each of 5 rounds**. Use  $R_n = 0.10 U_{n-1}$ ,  $U_n = U_{n-1} - R_n$ ,  $L_n = L_{n-1} - R_n$ , starting  $U_0 = 18$ ,  $L_0 = 40$  (all in \$B). Fill in the table.

Round $n$	1	2	3	4	5
$R_n$ (redeemed)					
$U_n$ (UST)					
$L_n$ (LUNA cap)					

**Cumulative UST redeemed over 5 rounds:** \_\_\_\_\_

**Q2.** The linear model **understates** the real collapse. Name **2 reasons** why reality was worse and give the approximate **actual** May 8 to 12 outcome.

**Q3.** Propose a **one-parameter design change** that would have made Terra survive a 10%/round redemption shock. Defend in one line.