Pre-Class Discovery: DeFi Lending — SOLUTIONS

Digital Finance – BSc Course Prof. Dr. Joerg Osterrieder

Complete before class. No prior knowledge required. Work alone or in pairs.

Activity 1: Why Does Your Bank Charge 7 %?

When you borrow $10,000 from a bank at 7 % interest, you pay $700 per year. But the bank pays depositors only 1–2 %. Where does the rest go?

(a) Estimate how the $700 is split across these five categories. Fill in approximate percentages (they should sum to 100 %):

Cost category	Your estimate (%)
Branches & staff	
Compliance & regulation	
Non-performing loans	
IT infrastructure	
Bank profit	

(b) A DeFi lending protocol charges 0.1 % in fees. Which of the five categories above does it eliminate, and which remain in some form?

Activity 2: The Collateral Puzzle

You hold $15,000 worth of ETH and need $10,000 in cash. A DeFi protocol requires 150 % collateralisation.

(a) If ETH drops 40 %, what is your collateral worth?

(b) At the 150 % liquidation ratio, what collateral value triggers liquidation of your $10,000 loan? What ETH price drop does that correspond to?

(c) When liquidation occurs, what happens to your ETH? Who benefits?

Activity 3: Flash Loan in 12 Seconds

A flash loan lets you borrow $1 M with *zero* collateral, use it, and repay it—all inside a single blockchain transaction.

(a) Describe, step by step, how someone could borrow \$1 M, exploit a price difference between Exchange A (\$1.00) and Exchange B (\$1.02) for a certain token, and repay the loan—all in one transaction.

(b) What happens if the price difference disappears mid-transaction? Why does the lender face zero risk?

Answer Key

A1: (a) Typical split: branches/staff 25–30%, compliance 10–15%, non-performing loans 15–20%, IT 10–15%, profit 20–30%. (b) DeFi eliminates branches/staff and most compliance costs. IT becomes smart-contract audits (much lower). Non-performing loan risk shifts to liquidation bots. Profit margin is distributed to liquidity providers.

A2: (a) $\$15{,}000 \times 0.60 = \$9{,}000$. (b) Liquidation at $\$10{,}000 \times 1.50 = \$15{,}000$ collateral value, i.e. any drop at all triggers it. More precisely, the loan is already at exactly 150 % at the start, so even a small drop triggers liquidation. (c) The protocol sells your ETH at a discount to repay the loan; liquidation bots earn the discount as profit.

A3: (a) 1. Borrow \$1 M. 2. Buy tokens on Exchange A at \$1.00 (get 1 M tokens). 3. Sell tokens on Exchange B at \$1.02 (receive \$1.02 M). 4. Repay \$1 M + fee. 5. Keep ∼\$20,000 profit. (b) The entire transaction reverts—it is atomic. The lender faces zero risk because the loan only exists if repayment succeeds within the same transaction.