

Pre-Class Discovery: Programmable Money — SOLUTIONS

Digital Finance – BSc Course

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

Activity 1: Program Your Salary

Your monthly salary is \$5,000. Instead of receiving it as a lump sum, imagine the money is **programmable**—you can attach rules that execute automatically.

- (a) Design a set of programmable rules for your salary. Fill in:

Destination	Amount	% of salary	Condition / time lock
Rent			
Savings			
Investments			
Daily spending			
Other			

- (b) Draw a simple flow diagram: Employer → Smart Contract → your destinations.

- (c) What advantage does this have over a standing order at your bank? What could go wrong?

Activity 2: The Relief Calculator

A government distributes \$10 million in disaster relief.

	Cash distribution	Programmable tokens
Leakage (fraud, admin)	30 %	5 %
Reaches victims	\$7 M	\$9.5 M

- (a) Calculate the dollar savings from using programmable tokens instead of cash.
- (b) The programmable tokens restrict spending to “approved essentials” (food, medicine, shelter). A family needs to buy medicine that is not on the approved list. What happens? Is this a bug or a feature?

- (c) Propose a design that preserves the anti-fraud benefits while allowing some flexibility for edge cases.

Activity 3: The Birthday Gift Debate

A programmable welfare payment expires after 30 days and can only be spent on government-approved essentials. A parent wants to buy a birthday gift for their child, but the token won't allow it.

- (a) **Side A—Efficient Policy:** Write 3 arguments supporting programmable restrictions on welfare payments.
- (b) **Side B—Authoritarian Control:** Write 3 arguments against programmable restrictions on welfare payments.
- (c) Which side do you find more convincing? Why?

Answer Key

A1: (a) Example: Rent \$1,500 (30%, auto-pay on 1st), Savings \$750 (15%, locked 12 months), Investments \$500 (10%, auto-DCA weekly), Daily \$1,750 (35%, released daily at \$58), Other \$500 (10%, emergency fund, 48h time lock). (b) Linear flow: Employer → smart contract splits into 5 wallets with conditions. (c) Advantage: atomic, trustless, composable with DeFi yields. Risk: smart-contract bugs, irreversibility, no human override.

A2: (a) Savings: $\$9.5M - \$7M = \$2.5M$. (b) The family cannot purchase the unapproved medicine—the transaction is rejected by the smart contract. This is a feature (anti-fraud) that becomes a bug (rigidity) at the individual level. (c) Multi-sig override: a local aid worker + the recipient can jointly approve off-list purchases; or a small “flexible allowance” (e.g. 10%) that is unrestricted.

A3: (a) Efficiency: reduces fraud, ensures funds reach intended purpose, taxpayer accountability, faster auditing, eliminates middlemen. (b) Control: treats recipients as untrustworthy, removes autonomy and dignity, creates surveillance infrastructure, excludes edge cases, government defines “essentials” arbitrarily. (c) Open answer—strong responses acknowledge the tension between efficiency and autonomy.