

# Blockchain HW1

## Task 1: Deploy ERC20 Token

Contract Address: 0x8a899A996b233bFFc73cBDEf0BDB8817fcd6a4Fb

The screenshot displays the PepeCard web interface. At the top left is the 'PepeCard' logo. The main area features a 5x5 grid of cards, each with a question mark. The card in the second row, second column is highlighted with a checkmark. To the right of the grid is a 'Player Info' panel containing the following details:

- Account:** 0xdCb4a67ED7740A50261D8086387b07168dba0C4A
- Token Balance:** 998.125 PC
- Buy-in:** 10,000 PC
- Safe Flips:** 1
- Accumulated Rewards:** 45.673 PC
- Next Card Reward:** +137.019 PC

Below the player info is an 'Admin Controls' panel with two buttons: 'Take Out ETH' and 'Mint Free Tokens'. At the bottom of the interface are two panels: 'Game Controls' and 'Purchase Tokens'.

**Game Controls:** Includes a 'Leave Game & Collect Rewards' button, a 'Redeem Tokens (PC)' section with an input field for the amount to redeem, a note that a 2% redemption fee applies, and a 'Redeem for ETH' button.

**Purchase Tokens:** Includes an 'ETH Amount' section with an input field for the amount, a 'Purchase Tokens' button, and a rate of 0.0001 ETH = 1 PC.

Demo website: <https://pepe-card.vercel.app/>

## Game Description

PepeCard is a risk-reward card flipping game implemented as a smart contract. Here's how it works:

### Game Rules

- Players start by buying in with tokens (minimum 100 wei)
- There's a 5x5 grid of cards (25 total)
- One card is randomly selected as the "ghost card"
- Players flip cards one at a time
- Each safe flip earns increasing rewards
- If the ghost card is flipped, the game ends and all accumulated rewards are lost
- Players can "Leave" at any time to collect their accumulated rewards

### Reward Mechanism

- Rewards increase quadratically with each successful flip
- House edge is 5%
- Base reward formula:  $A * (n^2 + n)$ , where:
  - $A = (25 * \text{buyin} * 0.95) / (5200 * 2)$
  - $n$  = number of successful flips

- Players can redeem(burn) tokens for ETH at a rate of 10000:1 with a 2% redemption fee


### Only Owner Functions

- TakeOut(): Allows the owner to withdraw all ETHs from the contract
- FreeToken(): Mints 10000 tokens to the owner

### Failed Transaction

When a non-owner tries to call the FreeToken() function, the transaction will fail with OwnableUnauthorizedAccount message. ex:

0xee9389db90693ab65c2addf7b9cd97aabe6e1836413a574924c8b5524aa75829


Home

Transaction Details
<
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Overview
State

[ This is a Sepolia Testnet transaction only ]

Transaction Hash:
0xee9389db90693ab65c2addf7b9cd97aabe6e1836413a574924c8b5524aa75829

Status:
Fail with Custom Error 'OwnableUnauthorizedAccount (account=0x6C82a1A792388880E1BD1B7725bdC234E0601325)'

Block:
7935317
77364 Block Confirmations

Timestamp:
10 days ago (Mar-19-2025 01:07:00 PM UTC)

Transaction Action:
Call
Free Token
Function by 0x6C82a1A7...4E0601325 on 0x8a899A99...7fcd6a4Fb

From:
0x6C82a1A792388880E1BD1B7725bdC234E0601325

To:
0x8a899A996b233bFFc73cBDEf0BDB8817fcd6a4Fb
Warning! Error encountered during contract execution [execution reverted]

Value:
0 ETH

Transaction Fee:
0.000044309407381512 ETH

Gas Price:
1.860489057 Gwei (0.000000001860489057 ETH)

## Task 2: Deploy ERC721 Token