Technical Design Document #9

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# Program Description

This program defines a class BankAcct that simulates the functionality of a simple bank account.   
It allows for account creation, deposit and withdrawal of funds, interest rate adjustments, and interest calculation over   
a specified number of days. The program also includes a \_\_str\_\_() method to display essential account information and a   
test function to demonstrate all operations. It prints key transactions and updated balances, offering an interactive   
and traceable transaction log.

# Functions and Methods Used in the Program (Listed in Order of Execution)

## 1. Class Name: BankAcct

Represents a bank account with standard banking operations.

### Method Name: \_\_init\_\_

Description: Initializes account details upon creation.  
Parameters:  
- name (str): Account holder's name  
- account\_number (str): Account number  
- initial\_balance (float): Starting balance  
- interest\_rate (float): Interest rate in decimal format (e.g., 0.04 for 4%)  
Returns: None

### Method Name: deposit

Description: Adds a specified amount to the account balance.  
Parameters:  
- amount (float): Amount to be deposited  
Logic:  
1. Validates if deposit is positive.  
2. Adds to balance and prints the new balance.  
Returns: None

### Method Name: withdraw

Description: Deducts a specified amount from the account balance.  
Parameters:  
- amount (float): Amount to withdraw  
Logic:  
1. Checks if the amount is positive and within available balance.  
2. Deducts amount, prints withdrawal success and updated balance.  
3. Handles exceptions during transaction.  
Returns: None

### Method Name: adjust\_interest\_rate

Description: Changes the account's interest rate.  
Parameters:  
- new\_rate (float): New interest rate (decimal format)  
Logic:  
1. Validates non-negative input.  
2. Updates interest rate and confirms update.  
Returns: None

### Method Name: get\_balance

Description: Returns the current account balance.  
Returns:  
- float: The current balance  
(Note: the print statement after return is unreachable.)

### Method Name: calculate\_interest

Description: Computes interest based on the current balance and number of days.  
Parameters:  
- days (int): Number of days over which interest is calculated  
Returns:  
- float: Calculated interest amount  
Logic:  
1. Validates non-negative day count.  
2. Applies formula: balance \* interest\_rate \* (days / 365)

### Method Name: \_\_str\_\_

Description: Returns a formatted string representation of the account.  
Returns:  
- str: Account holder, number, balance, and interest rate

## 2. Function Name: test\_bank\_acct

Description: Demonstrates account creation and transactions.  
Logic:  
1. Creates account for John Doe.  
2. Displays initial state.  
3. Makes a deposit and shows new balance.  
4. Makes a withdrawal and shows new balance.  
5. Calculates interest (not printed).  
6. Adjusts interest rate.  
Returns: None

## 3. Main Block

Description: Executes test\_bank\_acct() when run as a script.  
Logic:  
- Ensures modular execution and testing.

# Program Output Screenshots

A screenshot of a computer

AI-generated content may be incorrect.

# Repository Link

[CampsPA/ProgrammingExercise9](https://github.com/CampsPA/ProgrammingExercise9)