Practice 3 - Backend

Account Transfer System with Balance Validation in Node.js

Objective: Learn how to implement a secure money transfer API in Node.js and MongoDB without using database transactions. This helps you understand dependent multi-document updates, balance validation, and proper error handling.

Concept Overview:

In financial systems, fund transfers require consistent updates to multiple user accounts. This exercise teaches logical validation and sequential updates to ensure accuracy without database transactions.

Steps / Procedure:

Step 1: Initialize Project

```
mkdir account-transfer-system
cd account-transfer-system
npm init -y
npm install express mongoose body-parser
```

Step 2: Create server.js

```
const express = require('express');
const mongoose = require('mongoose');
const bodyParser = require('body-parser');
const app = express();
const PORT = 3000;
app.use(bodyParser.json());
mongoose.connect('mongodb://localhost:27017/bankDB', {
  useNewUrlParser: true,
 useUnifiedTopology: true
});
const userSchema = new mongoose.Schema({
 name: String,
 balance: Number
});
const User = mongoose.model('User', userSchema);
app.post('/create-users', async (req, res) => {
 try {
    await User.deleteMany({});
    const users = await User.insertMany([
      { name: 'Alice', balance: 1000 },
      { name: 'Bob', balance: 500 }
    ]);
    res.status(201).json({ message: 'Users created', users });
```

```
} catch (err) {
   res.status(500).json({ message: 'Error creating users' });
});
app.post('/transfer', async (req, res) => {
   const { fromUserId, toUserId, amount } = req.body;
    const sender = await User.findById(fromUserId);
    const receiver = await User.findById(toUserId);
    if (!sender || !receiver) {
     return res.status(404).json({ message: 'User not found' });
    if (sender.balance < amount) {</pre>
     return res.status(400).json({ message: 'Insufficient balance' });
    sender.balance -= amount;
    receiver.balance += amount;
    await sender.save();
   await receiver.save();
   res.status(200).json({
     message: `Transferred $${amount} from ${sender.name} to ${receiver.name}`,
     senderBalance: sender.balance,
     receiverBalance: receiver.balance
    });
  } catch (error) {
   res.status(500).json({ message: 'Transfer failed', error: error.message });
});
app.listen(PORT, () => {
 console.log(`Server running on http://localhost:${PORT}`);
});
```

Expected Output:

Result:

The system successfully transfers funds between users with proper validation and error handling. Logical checks ensure consistent data even without transactions.