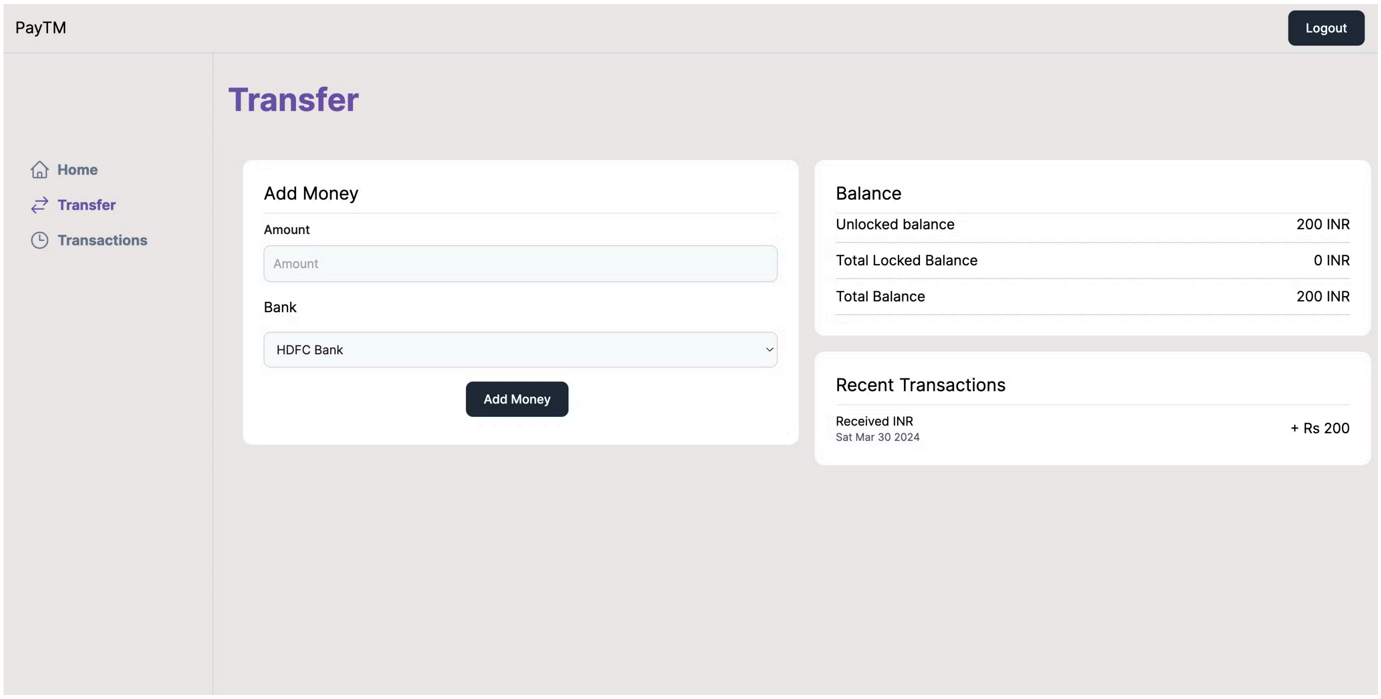
Get comfortable with the repo

Our starter repo is this - https://github.com/100xdevs-cohort-2/week-17-final-code

The repo has 3 issues, we'll be trying to fix them all today - https://github.com/100xdevs-cohort-2/week-17-final-code/issues



Transfer

Balance	
Unlocked balance	200 INR
Total Locked Balance	0 INR
Total Balance	200 INR

Recent Transactions

Received INR
Sat Mar 30 2024 + Rs 200

Let's setup the repo locally before we proceed

- Clone the repo

```
git clone
```

- npm install
- Run postgres either locally or on the cloud (neon.tech)

```
docker run  -e POSTGRES_PASSWORD=mysecretpassword -d -p 5432:5432 pos
```

nv

- Update .env files everywhere with the right db url

t

  - npx prisma migrate dev
  - npx prisma db seed
- Go to apps/user-app , run npm run dev
- Try logging in using phone - 1111111111 , password - alice (See seed.ts)

Finish onramps

Right now, we're able to see the onramp transactions that have been seeded .

We don't see any new ones though

Clicking on this button should initiate a new entry in the onRampTransactions table, that is eventually fulfilled by the bank-webhook module

Let's implement this feature via a server action

- Create a new action in lib/actions/createOnrampTransaction.ts

```
"use server";

import prisma from "@repo/db/client";
import { getServerSession } from "next-auth";
import { authOptions } from "../auth";

export async function createOnRampTransaction(provider: string, amount: nu
    // Ideally the token should come from the banking provider (hdfc/axis)
    c                    it getServerSession(authOptions);
    if                   ession.user?.id) {
      return {
        message: "Unauthenticated request"
      }
    }
    const token = (Math.random() * 1000).toString();
    await prisma.onRampTransaction.create({
      data: {
        provider,
        status: "Processing",
        startTime: new Date(),
        token: token,
        userId: Number(session?.user?.id),
        amount: amount * 100
      }
    });

    return {
      message: "Done"
    }
  }
```

- Call the action when the button is pressed (`AddMoneyCard`)

```
"use client"
import { Button } from "@repo/ui/button";
import { Card } from "@repo/ui/card";
import { Select } from "@repo/ui/select";
import { useState } from "react";
import { TextInput } from "@repo/ui/textinput";
import { createOnRampTransaction } from "../app/lib/actions/createOnrampT

const SUPPORTED_BANKS = [{
  name: "HDFC Bank",
  redirectUrl: "https://netbanking.hdfcbank.com"
}, {
  name: "Axis Bank",
  redirectUrl: "https://www.axisbank.com/"
export const AddMoney = () => {
  c                  tRedirectUrl] = useState(SUPPORTED_BANKS[0]?.redirect
  c                  rovider] = useState(SUPPORTED_BANKS[0]?.name || "");
  const [value, setValue] = useState(0)
  return <Card title="Add Money">
  <div className="w-full">
    <TextInput label={"Amount"} placeholder={"Amount"} onChange={(val) =
      setValue(Number(val))
    }} />
    <div className="py-4 text-left">
      Bank
    </div>
    <Select onSelect={(value) => {
      setRedirectUrl(SUPPORTED_BANKS.find(x => x.name === value)?.redirect
      setProvider(SUPPORTED_BANKS.find(x => x.name === value)?.name || "")
    }} options={SUPPORTED_BANKS.map(x => ({
      key: x.name,
      value: x.name
    }))} />
    <div className="flex justify-center pt-4">
      <Button onClick={async () => {
        await createOnRampTransaction(provider, value)
        window.location.href = redirectUrl || "";
      }}>
      Add Money
      </Button>
    </div>
  </div>
</Card>
}
```

Notice more balances getting added , but the balance will remain the same. This is because the bank hasn't yet approved the txn

Simulating the bank webhook

- npm run dev (if it fails, try installing esbuild)

- In another terminal, get the `token` for one of the onRamp transactions by
  ır PayTM Part-2 1 of 5 ıdio in `packages/db`

- Simulate a hdfcBank transaction
  POST http://localhost:3003/hdfcWebhook

```
{
  "token": "970.4572088875194",
  "user_identifier": 1,
  "amount": "210"
}
```

💡 Do you really need the amount/user id to come from the hdfc bank server? Or is the token enough?

Add transfers

Once money has been `onramped`, users should be allowed to transfer money to various wallets

Let's create a `P2P transfer` page

- Got to `user-app/app/(dashboard)/layout.tsx`

```
<SidebarItem href={"/p2p"} icon={<P2PTransferIcon />} title="P2P Transfer" />
```

```
function P2PTransferIcon() {
                                        2000/svg" fill="none" viewBox="0 0 24 2
                                         nejoin="round" d="m4.5 19.5 15-15m0 0
```

```
    </svg>
```

- Create a handler for /p2p page by creating `user-app/app/(dashboarD)/p2p/page.tsx`

```
export default function() {
    return <div>
        Dashboard
    </div>
}
```

- Add a `SendCard` component that let's you put the number of a user and amount to send

`user-app/components/SendCard.tsx`

```
"use client"
import { Button } from "@repo/ui/button";
import { Card } from "@repo/ui/card";
import { Center } from "@repo/ui/center";
import { TextInput } from "@repo/ui/textinput";
import { useState } from "react";

export function SendCard() {
    const [number, setNumber] = useState("");
    const [amount, setAmount] = useState("");

    return <div className="h-[90vh]">
        <Center>
            <Card title="Send">
                <div className="min-w-72 pt-2">
                    <TextInput placeholder={"Number"} label="Number" onChange={(v
                        setNumber(value)
                    }} />
                    <TextInput placeholder={"Amount"} label="Amount" onChange={(v
                        setAmount(value)
                    }} />
                    <div className="pt-4 flex justify-center">
                }}>Send</Button>
```

```
            </Card>
        </Center>
    </div>
}
```

user-app/app/(dashboard)/p2p/page.tsx

```
import { SendCard } from "../../../components/SendCard";

export default function() {
    return <div className="w-full">
        <SendCard />
    </div>
}
```

- Create a new action in lib/actions/p2pTransfer.tsx

```
"use server"
import { getServerSession } from "next-auth";
import { authOptions } from "../auth";
import prisma from "@repo/db/client";

export async function p2pTransfer(to: string, amount: number) {
    const session = await getServerSession(authOptions);
    const from = session?.user?.id;
    if (!from) {
        return {
            message: "Error while sending"
        }
    }
    const toUser = await prisma.user.findFirst({
        where: {
            number: to
        }
    });


        return {
```

```
        message: "User not found"
      }
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    }
    await prisma.$transaction(async (tx) => {
      const fromBalance = await tx.balance.findUnique({
        where: { userId: Number(from) },
      });
      if (!fromBalance || fromBalance.amount < amount) {
        throw new Error('Insufficient funds');
      }

      await tx.balance.update({
        where: { userId: Number(from) },
        data: { amount: { decrement: amount } },
      });

      await tx.balance.update({
        where: { userId: toUser.id },
        data: { amount: { increment: amount } },
      });
    });
}
```

- Update SendCard to call this action

```
"use client"
import { Button } from "@repo/ui/button";
import { Card } from "@repo/ui/card";
import { Center } from "@repo/ui/center";
import { TextInput } from "@repo/ui/textinput";
import { useState } from "react";
import { p2pTransfer } from "../app/lib/actions/p2pTransfer";

export function SendCard() {
    const [number, setNumber] = useState("");
    const [amount, setAmount] = useState("");

    return <div className="h-[90vh]">
        <Center>

                                    2">
                <TextInput placeholder={"Number"} label="Number" onChange={(v
                setNumber(value)

              laceholder={"Amount"} label="Amount" onChange={(v
                setAmount(value)
              }} />
              <div className="pt-4 flex justify-center">
                <Button onClick={async () => {
                  await p2pTransfer(number, Number(amount) * 100)
                }}>Send</Button>
              </div>
            </div>
          </Card>
        </Center>
      </div>
    }
```

Try sending money a few times and see if it works. You can inspect the DB by using `npx prisma studio` in `packages/db`

Problem with this approch.

Try simulating two request together by adding a 4s sleep timeout in the transaction

```
"use server"
import { getServerSession } from "next-auth";
import { authOptions } from "../auth";
import prisma from "@repo/db/client";

export async function p2pTransfer(to: string, amount: number) {
  const session = await getServerSession(authOptions);
  const from = session?.user?.id;
  if (!from) {
    return {
      message: "Error while sending"
    }
  }
                                        irst({
```

```
      number: to
    }
  });

  if (!toUser) {
    return {
      message: "User not found"
    }
  }
  await prisma.$transaction(async (tx) => {
    const fromBalance = await tx.balance.findUnique({
      where: { userId: Number(from) },
     });
     if (!fromBalance || fromBalance.amount < amount) {
      throw new Error('Insufficient funds');
     }
     await new Promise(r => setTimeout(r, 4000));
     await tx.balance.update({
      where: { userId: Number(from) },
      data: { amount: { decrement: amount } },
     });

     await tx.balance.update({
      where: { userId: toUser.id },
      data: { amount: { increment: amount } },
     });
  });
}
```

Send two requests in two tabs and see if you are able to receive negative balances?

Locking of rows

In postgres, a transaction ensure that either all the statements happen or none. It does not `lock` rows/ `revert` a transaction if something from this transaction got updated before the transaction committed (unlike

So we need to explicitly lock the balance row for the sending user so that [illegible] access it at at time, and the other one waits until the first transaction has committed

Hint 1 - https://www.cockroachlabs.com/blog/select-for-update/

Hint 2 - https://www.prisma.io/docs/orm/prisma-client/queries/raw-database-access/raw-queries

▼ Solution

```
"use server"
import { getServerSession } from "next-auth";
import { authOptions } from "../auth";
import prisma from "@repo/db/client";

export async function p2pTransfer(to: string, amount: number) {
  const session = await getServerSession(authOptions);
  const from = session?.user?.id;
  if (!from) {
    return {
      message: "Error while sending"
    }
  }
  const toUser = await prisma.user.findFirst({
    where: {
      number: to
    }
  });

  if (!toUser) {
    return {
      message: "User not found"
    }
  }
  await prisma.$transaction(async (tx) => {
    await tx.$queryRaw`SELECT * FROM "Balance" WHERE "userId" = ${Numbe
```

ransactions table

Update `schema.prisma`

```
model User {
  id                Int                 @id @default(autoincrement())
  email             String?             @unique
  name              String?
  number            String              @unique
  password          String
  OnRampTransaction OnRampTransaction[]
  Balance           Balance[]
  sentTransfers     p2pTransfer[]       @relation(name: "FromUserRelation")
  receivedTransfers p2pTransfer[]       @relation(name: "ToUserRelation")
}

model p2pTransfer {
  id         Int          @id @default(autoincrement())
  amount     Int
  timestamp  DateTime
  fromUserId Int
  fromUser   User         @relation(name: "FromUserRelation", fields: [fromUserId],
  toUserId   Int
  toUser     User         @relation(name: "ToUserRelation", fields: [toUserId], referen
}
```

- Run `npx prisma migrate dev --name added_p2p_txn`
- Regenerate client `npx prisma generate`
- Do a global build (npm run build) (it's fine if it fails
- Add entries to `p2pTransfer` whenever a transfer happens

Assignment: Add frontend for the p2p transactions

Can you add code that let's you see the users existing transactions?

Final code - https://github.com/100xdevs-cohort-2/week-18-live-1-final

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