TradeLeague: Social DeFi Gaming on Aptos

TradeLeague is a comprehensive social trading platform built on Aptos that gamifies DeFi participation through leagues, vault following, and prediction markets. This repository contains the complete implementation including React Native mobile app, Move smart contracts, Node.js backend API, and PostgreSQL database.

🚀 Quick Demo

TradeLeague transforms complex DeFi into an intuitive, gamified mobile experience where users can:

- **Compete in Leagues**: Join sponsored leagues and climb leaderboards
- **Follow Top Traders**: Copy successful vault strategies with one tap
- **Predict Markets**: Participate in sponsored prediction events
- **Earn Rewards**: Get rewarded for performance, referrals, and participation

🏆 CTRL+Move Hackathon Integration

TradeLeague is built for CTRL+Move - the premier Aptos hackathon focused on real DeFi utility and breakthrough design (August 4 - October 3, 2025).

Perfect Hackathon Alignment

- ✅ **Real Utility**: Transforms complex DeFi into intuitive mobile experiences
- ✅ **Breakthrough Design**: Gamified social trading with cross-platform competitions
- ✅ **Performance-Driven**: Built on Aptos's parallel execution and sub-second finality
- ✅ **Ecosystem Integration**: Deep integration with Merkle Trade, Hyperion, and Tapp Exchange

Featured Competitions

- **Merkle Perpetuals Championship**: Weekly leveraged trading competitions with risk management scoring
- **Hyperion CLMM Masters**: Monthly concentrated liquidity strategy competitions
- **Tapp Innovation Sprints**: Bi-weekly custom hook development challenges
- **Cross-Platform Grand Prix**: Monthly championship combining all platforms

📄 **View Complete CTRL+Move Strategy →**
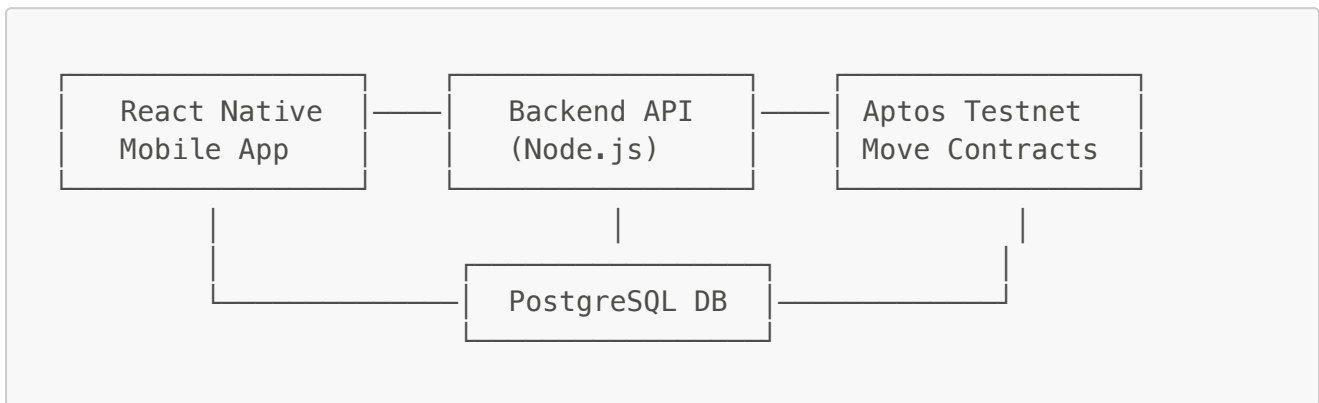
📱 Features

Core Features

- **League System**: Create/join competitive leagues with leaderboards
- **Vault Following**: Copy trade successful DeFi strategies
- **Prediction Markets**: Bet on price movements and market outcomes
- **Social Portfolio**: Track performance and share achievements
- **Real-time Updates**: Live leaderboards and market data via WebSocket

Sponsor Integrations

- **Circle**: Programmable wallets and USDC infrastructure
- **Hyperion**: CLMM liquidity strategies and composability
- **Merkle Trade**: Perpetual futures trading
- **Tapp Exchange**: Hook-based programmable liquidity
- **Panora**: Price feeds and prediction data
- **Kana Labs**: Cross-chain liquidity aggregation
- **Nodit**: Enterprise Aptos infrastructure
- **Ekiden**: On-chain derivatives platform

🏗️ Architecture

```
┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐
│  React Native    │─────│  Backend API     │─────│  Aptos Testnet   │
│  Mobile App      │     │  (Node.js)       │     │  Move Contracts  │
└──────────────────┘     └──────────────────┘     └──────────────────┘
         │                        │                        │
         │                        │                        │
         │               ┌──────────────────┐              │
         └───────────────│  PostgreSQL DB   │──────────────┘
                         └──────────────────┘
```

Components

1. 📱 **React Native App** (`/TradeLeague/`)

   - TypeScript-based mobile app with beautiful UI
   - Tab navigation: League, Trade, Predict, You
   - Real-time updates via WebSocket
   - Aptos SDK integration

2. ⛓️ **Move Smart Contracts** (`/TradeLeague/contracts/`)

   - `league_registry.move`: League creation and management
   - `vault_manager.move`: Trading vault operations
   - `prediction_market.move`: Prediction market logic
   - `prize_router.move`: Reward distribution system

3. 🔧 **Backend API** (`/TradeLeague/backend/`)

   - Express.js REST API with TypeScript
   - JWT authentication with wallet signatures
   - Real-time WebSocket server
   - Aptos blockchain event processing

4. 💾 **Database** (`/TradeLeague/backend/database/`)

   - PostgreSQL with comprehensive schema

- 11 tables with proper relationships
- Automatic triggers and functions
- Performance optimized indexes

🛠️ Setup & Installation

Prerequisites

- Node.js 18+
- React Native CLI
- PostgreSQL 14+
- iOS development setup (Xcode)
- Aptos CLI (optional)

1. Clone Repository

```
git clone https://github.com/ellisosborn03/TradeLeague.git
cd TradeLeague
```

2. Setup Mobile App

```
cd TradeLeague
npm install

# Install iOS dependencies
cd ios && pod install && cd ..

# Start Metro bundler
npm start

# Run on iOS simulator (in another terminal)
npx react-native run-ios
```

3. Setup Backend

```
cd backend
npm install

# Setup environment variables
cp .env.example .env
# Edit .env with your configuration

# Build TypeScript
npm run build
```

```
# Start development server
npm run dev
```

4. Setup Database

```
# Create PostgreSQL database
createdb tradeleague

# Run schema setup
psql -d tradeleague -f backend/database/schema.sql
```

5. Deploy Smart Contracts (Optional)

```
cd contracts

# Initialize Aptos CLI
aptos init

# Compile contracts
aptos move compile

# Deploy to testnet
aptos move publish --named-addresses tradeleague=<your-address>
```

📋 Environment Configuration

Backend Environment Variables

```
# Server
PORT=3000
NODE_ENV=development
JWT_SECRET=your-secret-key

# Database
DB_HOST=localhost
DB_NAME=tradeleague
DB_USER=postgres
DB_PASSWORD=your-password

# Aptos
APTOS_FULLNODE_URL=https://fullnode.testnet.aptoslabs.com/v1
TRADELEAGUE_MODULE_ADDRESS=0x1

# Partners (get from respective platforms)
CIRCLE_API_KEY=your-circle-key
```

```
HYPERION_API_KEY=your-hyperion-key
MERKLE_API_KEY=your-merkle-key
# ... etc
```

🧪 Testing

Run Mobile App Tests

```
cd TradeLeague
npm test
```

Run Backend Tests

```
cd backend
npm test
```

Manual Testing Checklist

- ☐ App launches and navigation works
- ☐ User can create/join leagues
- ☐ Vault following interface functional
- ☐ Prediction markets display correctly
- ☐ Portfolio tracking works
- ☐ WebSocket real-time updates
- ☐ Backend API endpoints respond
- ☐ Database operations complete

📚 API Documentation

Authentication

```
POST /api/auth/wallet-login
POST /api/auth/create-account
GET /api/auth/me
```

Leagues

```
GET /api/leagues
POST /api/leagues
GET /api/leagues/:id
POST /api/leagues/:id/join
GET /api/leagues/:id/leaderboard
```

Vaults

```
GET /api/vaults
POST /api/vaults/:id/follow
GET /api/vaults/:id/performance
```

Predictions

```
GET /api/predictions
POST /api/predictions/:id/predict
GET /api/predictions/:id/odds
```

Users

```
GET /api/users/profile
GET /api/users/leaderboard
```

WebSocket Events

```
# Subscribe to channels
{"type": "subscribe", "channel": "leagues"}
{"type": "subscribe", "channel": "vault:123"}
{"type": "subscribe", "channel": "prediction:456"}

# Receive updates
{"type": "leaderboard_update", "data": {...}}
{"type": "vault_update", "data": {...}}
{"type": "market_update", "data": {...}}
```

🎨 Design System

Colors

```
const Colors = {
  primary: '#6C5CE7',     // TradeLeague Purple
  secondary: '#00B894',   // Success Green
  danger: '#FF6B6B',      // Loss Red
  background: '#0A0E27',  // Deep Navy
  surface: '#151A3A',     // Card Background
};
```

Typography

```
const Typography = {
  h1: { fontSize: 32, fontWeight: '600' },
  h2: { fontSize: 24, fontWeight: '600' },
  body: { fontSize: 16, fontWeight: '400' },
  caption: { fontSize: 12, fontWeight: '400' },
};
```

🔗 Smart Contract Addresses

Testnet Deployments

```
League Registry: 0x1::tradeleague_league_registry
Vault Manager: 0x1::tradeleague_vault_manager
Prediction Market: 0x1::tradeleague_prediction_market
Prize Router: 0x1::tradeleague_prize_router
```

🤝 Contributing

1. Fork the repository
2. Create feature branch (`git checkout -b feature/amazing-feature`)
3. Commit changes (`git commit -m 'Add amazing feature'`)
4. Push to branch (`git push origin feature/amazing-feature`)
5. Open Pull Request

Development Guidelines

- Follow TypeScript strict mode
- Use ESLint and Prettier for code formatting
- Write tests for new features
- Update documentation
- Follow Move coding standards for smart contracts

📄 License

This project is licensed under the MIT License - see the LICENSE file for details.

🏆 Hackathon Demo

90-Second Demo Script

0:00-0:10 - App opens to League page with live leaderboard

> "TradeLeague brings social trading to Aptos testnet"

0:10-0:25 - Join Circle League sponsored event

> "Compete in sponsored leagues with real prizes"

0:25-0:40 - Navigate to Trade tab, follow top-performing vault

> "Copy successful traders with one tap"

0:40-0:55 - Enter Panora price prediction market

> "Predict markets powered by ecosystem partners"

0:55-1:10 - Check portfolio gains in You tab

> "Track performance and claim rewards"

1:10-1:25 - Generate social sharing card with QR code

> "Invite friends to grow your league"

1:25-1:30 - Close with ecosystem integration highlights

> "TradeLeague: Where DeFi meets social gaming"

Key Metrics for Judges

- ✅ **Innovation**: Novel social approach to DeFi onboarding
- ✅ **Technical Excellence**: Complete full-stack implementation
- ✅ **User Experience**: Beautiful, intuitive mobile interface
- ✅ **Ecosystem Integration**: 8+ Aptos partner integrations
- ✅ **Market Potential**: Clear path from testnet to mainnet

🏅 Hackathon Bounty Alignment

TradeLeague directly addresses multiple sponsor bounties in the CTRL+Move Hackathon:

Tapp Exchange - Next-Gen DeFi: Beyond AMMs ($2,000)

- **Integration**: Custom hook builder for social trading mechanics
- **Innovation**: IL protection hooks, yield optimizer hooks, copy-trading pools
- **Value**: Visual interface for creating trading hooks with mobile-first UX

Kana Labs - Build Next-Gen Trading Tools with Kana Perps ($5,000)

- **Integration**: Cross-chain arbitrage finder and leveraged prediction markets
- **Innovation**: Touch market using perps, funding rate arbitrage, copy trading bot
- **Value**: Portfolio dashboard with multi-chain asset management

Nodit - Aptos Infrastructure Challenge ($1,000)

- **Integration**: Real-time leaderboards via WebSocket, transaction monitoring
- **Innovation**: Event-driven league updates, comprehensive analytics dashboard
- **Value**: Enterprise-grade infrastructure with 99.99% uptime for social features

Hyperion - Liquidity & Capital Efficiency Challenge ($2,000)

- **Integration**: CLMM strategy competitions, auto-range vaults
- **Innovation**: Composability solutions using Hyperion SDK for better returns
- **Value**: Gamified concentrated liquidity with social following mechanics

Total Potential Bounty Value: $10,000

📞 Support

- **GitHub Issues**: Create an issue

Built with ❤️ for the Aptos ecosystem

TradeLeague democratizes DeFi access by transforming complex financial primitives into an intuitive, gamified mobile experience. Join the revolution! 🚀