DrawChain

FREE Tech Stack & Timeline for Students

100% Free - No Credit Card Required

Student-Friendly Free Stack

This version uses completely free services that are perfect for students. Everything can be built and deployed without spending a single dollar, while still creating a professional portfolio project.

Complete Free Tech Stack

Frontend Stack

Technology	Version	Why This Choice
React	18.3.x	Industry standard, free, great for resumes
TypeScript	5.x	Free, shows professionalism
Vite	5.x	Free, faster than alternatives
Zustand	4.x	Free, simpler than Redux
Socket.io Client	4.7.x	Free WebSocket library
Tailwind CSS	3.x	Free, fast styling

Backend Stack

Technology	Version	Why This Choice
Node.js	20.x LTS	Free, same language as frontend
Express.js	4.x	Free, simple API framework
Socket.io	4.7.x	Free WebSocket server
SQLite	3.x	Free, no server needed, file-based
Prisma	5.x	Free ORM, works with SQLite
node-cache	5.x	Free in-memory cache (replaces

		Redis)

Free Hosting & Services

Service	Free Tier	What You Get
Vercel	100% Free	Frontend hosting, custom domain, HTTPS
Render.com	100% Free	Backend hosting, 750 hrs/month, WebSockets
Cloudinary	100% Free	25 GB storage, 25 GB bandwidth/month
GitHub	100% Free	Code hosting, CI/CD with Actions

Simplified Development Timeline

Total time: 6-8 weeks for a student working part-time (10-15 hours per week).

Phase	Duration	Hours/Week	What You'll Build
Week 1	1 week	10-12 hours	Setup: Git, Node.js, React project, basic UI
Weeks 2-3	2 weeks	10-12 hours	Drawing canvas, all UI pages, routing
Weeks 4-5	2 weeks	12-15 hours	Backend API, WebSocket server, SQLite database
Week 6	1 week	10-12 hours	Connect frontend + backend, image uploads to Cloudinary
Week 7	1 week	8-10 hours	Polish UI, animations, mobile optimization
Week 8	1 week	8-10 hours	Deploy to Vercel + Render, test, fix bugs

Step-by-Step Setup Guide

1. Get Free Accounts (5 minutes)

- GitHub - Sign up at github.com (code hosting)
- Vercel - Sign up at vercel.com using GitHub (frontend hosting)
- Render - Sign up at render.com using GitHub (backend hosting)
- Cloudinary - Sign up at cloudinary.com (image storage)

2. Install Software (10 minutes)

- Node.js - Download from nodejs.org (choose LTS version)
- VS Code - Download from code.visualstudio.com (code editor)
- Git - Download from git-scm.com (version control)

3. Create Your Project

Frontend (React):

npm create vite@latest drawchain-frontend -- --template react-ts

cd drawchain-frontend && npm install

Backend (Node.js):

mkdir drawchain-backend && cd drawchain-backend

npm init -y

npm install express socket.io prisma @prisma/client cors cloudinary multer

4. Deploy Your App (Free!)

Frontend on Vercel:

- Push code to GitHub
- Go to vercel.com, click 'New Project'
- Select your GitHub repo, click Deploy - Done!

Backend on Render:

- Push backend code to GitHub
- Go to render.com, click 'New Web Service'
- Select GitHub repo, choose 'Node' environment
- Click Create - Your backend is live!

What's Different from Paid Version?

Changes Made for Free Tier

Original (Paid)	Free Alternative	Impact

PostgreSQL on AWS RDS	SQLite (file-based)	Works for 10-20 concurrent users
Redis on AWS	node-cache (in-memory)	Resets on server restart, fine for demo
AWS S3 + CloudFront	Cloudinary Free	25GB storage, perfect for portfolio
AWS EC2	Render.com Free	Sleeps after 15 min idle, wakes on request

Limitations to Know About

- Render backend sleeps after 15 minutes of no activity (first request takes 30-60 seconds to wake up)
- SQLite handles about 10-20 concurrent users well (perfect for portfolio demo)
- In-memory cache resets when server restarts (game state is lost)
- Cloudinary has 25GB monthly bandwidth (about 500-1000 games)

Why This is Still Great for Your Resume

- Shows you understand modern web technologies
- Demonstrates real-time WebSocket implementation
- Proves you can deploy and manage full-stack apps
- It's a live, working project that recruiters can actually use!
- Total cost: $0 - shows resourcefulness

Total Cost Breakdown

Service	Monthly Cost
Vercel (Frontend Hosting)	**$0**
Render.com (Backend Hosting)	**$0**
Cloudinary (Image Storage)	**$0**
GitHub (Code Hosting & CI/CD)	**$0**
SQLite (Database)	**$0**
All Development Tools (Node, VS Code, Git)	**$0**
TOTAL COST	**$0/month**

Tips for Success as a Student

Learning Resources (All Free!)

- React: React.dev official tutorial + freeCodeCamp YouTube videos
- TypeScript: TypeScript for JavaScript Programmers (15 min read)
- Node.js: Node.js Crash Course by Traversy Media (YouTube)
- Socket.io: Official Socket.io chat app tutorial
- Canvas API: MDN Canvas tutorial + create a simple paint app

Time Management

- Work 2-3 hours per day, 5 days a week = done in 6-8 weeks
- Can't code daily? Work 10-15 hours on weekends = 8-10 weeks total
- During school breaks? Work full-time = done in 2-3 weeks!
- Use Git to commit daily - shows consistent work ethic to recruiters

Making it Resume-Worthy

- Write a good README with screenshots and live demo link
- Add the project to your resume's Projects section with tech stack listed
- Create a short demo video (1-2 min) showing it working
- Share on LinkedIn with #100DaysOfCode or similar hashtags
- Deploy early and share with friends for feedback

When to Upgrade to Paid Services

You only need to upgrade if:

- You have 50+ concurrent users regularly
- You're getting serious traction and want zero downtime
- You want to monetize the app

For a portfolio project? The free tier is perfect!

Quick Start Commands

Frontend Setup

```
npm create vite@latest drawchain-frontend -- --template react-ts
cd drawchain-frontend
npm install socket.io-client zustand react-router-dom
npm install -D tailwindcss postcss autoprefixer
npx tailwindcss init -p
```

Backend Setup

```
mkdir drawchain-backend && cd drawchain-backend
npm init -y
npm install express socket.io cors
npm install prisma @prisma/client
npm install cloudinary multer node-cache
npm install -D typescript @types/node @types/express
npx prisma init --datasource-provider sqlite
```

You've got this! Build something amazing - for free! 🚀