

# AI-Powered Web Development: Vibe-Coding with Windsurf, GitHub, and Vercel

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## What is Vibe-Coding?

**Vibe-coding** is a modern development approach where you use natural language prompts to guide AI in building software, rather than writing every line of code manually. With Windsurf's Cascade AI, you describe what you want, and the AI generates the implementation.

### Traditional vs Vibe-Coding

Traditional	Vibe-Coding with AI
Write code manually	Describe what you want
Search Stack Overflow	Ask AI for solutions
Debug for hours	AI suggests fixes instantly
Read documentation	AI explains and implements
Slow iteration	Rapid prototyping

### Why It Works

- **Speed:** Build prototypes in minutes, not hours
- **Learning:** AI explains concepts as it codes
- **Exploration:** Try ideas without deep technical knowledge
- **Focus:** Concentrate on design and user experience

## Setting Up Your Project Folder in Windsurf

### Creating a New Folder in the Documents Directory

Before starting your project, you need to create a dedicated folder to store all your files. Here's how to do it within Windsurf:

## Method 1: Using the Explorer Panel (Recommended)

### 1. Open Windsurf

- Launch the Windsurf IDE from your desktop or Start menu

### 2. Access the Explorer Panel

- Look for the file icon in the left sidebar (or press `Ctrl/Cmd + Shift + E`)
- This shows your current workspace structure

### 3. Navigate to Documents

- Click on `File` → `Open Folder`
- Navigate to `C:\Users\YourUsername\Documents` (Windows) or `/Users/YourUsername/Documents` (Mac)
- Click `Select Folder` or `Open`

### 4. Create Your Project Folder

- Right-click in the Explorer panel on the Documents folder
- Select `New Folder` from the context menu
- Type your project name (e.g., `my-website`)
- Press `Enter` to confirm

### 5. Open the New Folder

- Click `File` → `Open Folder` again
- Navigate to your newly created folder
- Click `Open`
- Windsurf will reload with your project folder as the workspace

## Method 2: Using the Terminal

### 1. Open Terminal in Windsurf

- Press `Ctrl+`` (backtick) or go to `Terminal` → `New Terminal`
- The terminal appears at the bottom of the screen

### 2. Create the Folder

```
# Navigate to Documents
cd ~/Documents

# Create project folder
mkdir my-website

# Navigate into the folder
cd my-website

# Open this folder in Windsurf
code .
```

### 3. Windsurf Opens the Folder

- The folder is now your active workspace

- You're ready to start your project

### Method 3: Using Cascade (AI)

#### 1. Open Cascade Panel

- Press `Ctrl/Cmd + L`

#### 2. Ask AI to Create the Folder

Create a new folder called "my-website" in my Documents directory and open it as the current workspace.

#### 3. Cascade Will:

- Create the folder for you
- Set it as the active workspace
- Confirm the action

---

## Managing Projects with Workspace Files

### What is a Workspace File?

A workspace file ( `.code-workspace` ) is a configuration file that saves your project settings, open files, and folder structure. It allows you to quickly reopen entire projects with all your preferences intact.

### Benefits of Using Workspace Files

- **Quick Access:** Open previous projects instantly
- **Saved State:** Remember open files, terminal history, and settings
- **Multiple Projects:** Switch between different projects easily
- **Consistency:** Same environment every time you open the project
- **Team Sharing:** Share workspace configurations with teammates

### Creating a Workspace File

#### Method 1: Save Current Workspace

##### 1. Open Your Project Folder

- Ensure your project is loaded in Windsurf
- Check the Explorer panel shows your project files

##### 2. Save Workspace

- Click `File` → `Save Workspace As...`
- Navigate to a location (e.g., `Documents/Workspaces/` )
- Name the file: `my-project.code-workspace`
- Click `Save`

##### 3. Workspace File Created

- A `.code-workspace` file is saved
- Contains paths to your project folders and settings

#### Method 2: Create from Scratch

### 1. Create New Workspace

- Click `File` → `Open Workspace from File...`
- Or `File` → `New Window` → then add folders

### 2. Add Folders to Workspace

- Click `File` → `Add Folder to Workspace`
- Select your project folder
- Repeat for multiple projects

### 3. Save the Workspace

- `File` → `Save Workspace As...`
- Name and save the file

## Opening a Previous Project

### Option 1: Double-Click Workspace File

1. Navigate to where you saved `.code-workspace` file
2. Double-click the file
3. Windsurf opens with your complete project setup

### Option 2: From Within Windsurf

1. Click `File` → `Open Workspace from File...`
2. Navigate to your `.code-workspace` file
3. Click `Open`
4. Your project loads with all previous settings

### Option 3: Recent Workspaces

1. Click `File` → `Open Recent`
2. Select from list of recent workspaces
3. Project opens instantly

## Workspace File Structure

A workspace file looks like this:

```
{
  "folders": [
    {
      "path": "my-website"
    }
  ],
  "settings": {
    "editor.fontSize": 14,
    "editor.tabSize": 2
  },
  "extensions": {
    "recommendations": [
      "esbenp.prettier-vscode",
      "bradlc.vscode-tailwindcss"
    ]
  }
}
```

```
}  
}
```

## Best Practices for Workspaces

### 1. Organize by Client/Project

```
Workspaces/  
├─ client-a-website.code-workspace  
├─ personal-blog.code-workspace  
├─ ecommerce-project.code-workspace  
└─ tutorial-learning.code-workspace
```

### 2. Include Multiple Related Folders

- Frontend and backend in same workspace
- Shared components library + main project

### 3. Version Control Workspaces

- Commit `.code-workspace` files to Git
- Team members get same setup

### 4. Customize Per Project

- Different color themes for different clients
- Specific extensions for project type

---

## Project Planning Before Opening Windsurf

### Why Plan Before Coding?

Planning before opening your IDE helps you:

- Clarify project goals and requirements
- Make better use of AI assistance
- Avoid rework and refactoring
- Stay focused on the end result
- Communicate clearly with Cascade

### The Pre-Development Checklist

#### Step 1: Define the Project Purpose

##### Questions to Answer:

- What problem does this project solve?
- Who is the target audience?
- What is the primary goal? (inform, sell, entertain, educate)
- What makes this project unique?

##### Document Your Answers:

```
Project: Portfolio Website  
Purpose: Showcase my work to potential clients
```

Audience: Small business owners looking for web design  
Goal: Generate leads through contact form  
Unique Factor: Interactive project gallery with live demos

## Step 2: Plan the Content Structure

### Outline Your Pages:

#### Home

- └ Hero section (headline, CTA)
- └ Services overview
- └ Featured projects (3-4 items)
- └ Testimonials
- └ Contact CTA

#### About

- └ Bio/Story
- └ Skills/Tech stack
- └ Experience timeline
- └ Download resume button

#### Portfolio

- └ Project grid
- └ Filter categories
- └ Project detail modals
- └ Live demo links

#### Contact

- └ Contact form
- └ Social links
- └ Email/phone info
- └ Location map

### List Required Assets:

- Logo (SVG or PNG)
- Project screenshots (16:9 ratio)
- Profile photo (square)
- Resume PDF
- Favicon

## Step 3: Define the Design System

### Color Palette:

Primary: #DC2626 (Red)  
Secondary: #1F2937 (Dark Gray)  
Accent: #10B981 (Green for success)  
Background: #FFFFFF (White)  
Text: #111827 (Near Black)

### Typography:

```
Headings: Inter, sans-serif
Body: Inter, sans-serif
Code: JetBrains Mono, monospace
```

#### Component Ideas:

- Navigation: Sticky header, mobile hamburger
- Buttons: Primary (filled), Secondary (outline)
- Cards: Rounded corners, subtle shadow
- Forms: Clean labels, inline validation

#### Step 4: Technical Decisions

##### Framework & Tools:

- Next.js with App Router
- TypeScript for type safety
- Tailwind CSS for styling
- shadcn/ui for components
- Framer Motion for animations

##### Integrations:

- Contact form → Email service (Resend/Formspring)
- Analytics → Google Analytics or Plausible
- Hosting → Vercel
- Domain → Custom domain (optional)

##### Data Structure:

```
// Project data structure
interface Project {
  id: string;
  title: string;
  description: string;
  image: string;
  tags: string[];
  liveUrl: string;
  githubUrl?: string;
}
```

#### Step 5: Create a Prompt Strategy

##### Prepare Initial Prompt:

```
Create a portfolio website for a web developer with:
- Dark red (#DC2626) primary color
- Clean, modern design
- Hero section with "John Doe - Full Stack Developer"
- Services: Web Design, Development, SEO
- Portfolio grid with 6 projects
- Contact form with validation
- Responsive design
- Dark mode support
```

### Plan Follow-Up Prompts:

1. "Add animations to the hero section"
2. "Create project detail modals"
3. "Add form validation and error handling"
4. "Optimize for SEO with meta tags"
5. "Add loading states and transitions"

### Step 6: Set Up Your Environment

#### Before Opening Windsurf:

1. ☒ Project folder created
2. ☒ Planning documents ready
3. ☒ Assets collected in project folder
4. ☒ Color palette documented
5. ☒ Content outline complete

#### Organize Assets:

```
my-website/  
├── assets/  
│   ├── logo.svg  
│   ├── profile-photo.jpg  
│   ├── project-1.jpg  
│   ├── project-2.jpg  
│   └── resume.pdf  
└── planning/  
    ├── content-outline.md  
    ├── design-system.md  
    └── prompt-strategy.md
```

### Using Your Plan with Cascade

#### Start with Context:

I'm building a portfolio website. Here's my plan:

- Target: Small business clients
- Pages: Home, About, Portfolio, Contact
- Style: Modern, professional, red accent color
- Features: Dark mode, contact form, project gallery

Let's start by creating the project structure and home page.

#### Reference Your Plan:

According to my design system (primary color #DC2626),  
create a navigation component with:

- Logo on left
- Links: Home, About, Portfolio, Contact
- CTA button "Hire Me" in red
- Mobile hamburger menu



## Quick Reference: Planning Template

```
# Project Plan: [Name]

## Purpose
- Problem: [What it solves]
- Audience: [Who it's for]
- Goal: [What success looks like]

## Pages & Content
1. [Page Name]
  - [Section 1]
  - [Section 2]

## Design
- Primary: #[COLOR]
- Style: [Modern/Classic/Playful]
- Fonts: [Font names]

## Tech Stack
- Framework: Next.js
- Styling: Tailwind CSS
- Components: shadcn/ui
- Animations: Framer Motion

## Assets Needed
- [ ] Logo
- [ ] Images
- [ ] Copy/text

## Prompt Strategy
1. [First prompt]
2. [Second prompt]
3. [Third prompt]
```

## Understanding the Technologies

Before diving into development, let's understand the key technologies that power your workflow:

### Next.js

**What is Next.js?** Next.js is a React framework that enables server-side rendering, static site generation, and full-stack web applications. It provides the foundation for building modern, fast, and SEO-friendly websites.

#### Key Features:

- **App Router:** Modern routing system with nested layouts
- **Server Components:** Render components on the server for better performance
- **Static Generation:** Pre-build pages for instant loading
- **API Routes:** Build backend endpoints within your Next.js app
- **Image Optimization:** Automatic image resizing and optimization

- **TypeScript Support:** Built-in type safety

### Why Use It?

- Faster page loads through server-side rendering
- Better SEO than traditional single-page apps
- Automatic code splitting for smaller bundles
- Developer-friendly with hot reloading
- Production-ready out of the box

### Example:

```
// app/page.tsx
export default function Home() {
  return (
    <main>
      <h1>Welcome to Next.js</h1>
    </main>
  )
}
```

---

## Git

**What is Git?** Git is a distributed version control system that tracks changes in your code over time. It allows you to save snapshots of your project, collaborate with others, and revert changes when needed.

### Key Concepts:

- **Repository:** A folder containing your project and its history
- **Commit:** A snapshot of your files at a specific point in time
- **Branch:** An independent line of development
- **Staging:** Preparing files to be committed
- **History:** Complete record of all changes made

### Why Use It?

- Track every change to your code
- Experiment safely with new features
- Collaborate without overwriting others' work
- Revert mistakes instantly
- Maintain multiple versions of your project

### Essential Commands:

```
# Start tracking a project
git init

# Save changes with a message
git add .
git commit -m "Added hero section"

# View history
git log
```

```
# Check current status
git status
```

---

## GitHub

**What is GitHub?** GitHub is a web-based platform that hosts Git repositories. It provides a centralized place to store your code, collaborate with others, and manage projects.

### Key Features:

- **Remote Repositories:** Store code in the cloud
- **Collaboration Tools:** Pull requests, code reviews, issues
- **Actions:** Automated workflows for testing and deployment
- **Pages:** Host static websites directly from repositories
- **Teams:** Organize contributors and permissions

### Why Use It?

- Backup your code safely in the cloud
- Share projects with others
- Collaborate on team projects
- Showcase your work to potential employers
- Integrate with deployment platforms like Vercel

### Workflow:

```
# Connect local to remote
git remote add origin https://github.com/username/repo.git

# Upload changes
git push -u origin main

# Download changes
git pull origin main
```

---

## Vercel

**What is Vercel?** Vercel is a cloud platform for static sites and serverless functions. It provides instant deployment, automatic scaling, and global CDN distribution.

### Key Features:

- **Zero-Config Deployment:** Push to GitHub, auto-deploy
- **Preview URLs:** Every branch gets its own URL
- **Serverless Functions:** API endpoints without managing servers
- **Edge Network:** Global CDN for fast loading worldwide
- **Analytics:** Built-in performance monitoring
- **Environment Variables:** Secure configuration management

### Why Use It?

- Deploy websites with a single `git push`
- Automatic HTTPS and custom domains

- Instant rollbacks to previous versions
- Preview deployments for testing
- Optimized for Next.js applications
- Free tier for personal projects

#### Deployment Process:

1. Connect GitHub repository to Vercel
  2. Push code to main branch
  3. Vercel automatically builds and deploys
  4. Site is live at `your-project.vercel.app`
- 

## Windsurf IDE

**What is Windsurf?** Windsurf is an AI-powered integrated development environment (IDE) that combines code editing with artificial intelligence assistance. It's built on top of VS Code with added AI capabilities through Cascade.

#### Key Features:

- **Cascade AI:** Natural language coding assistant
- **Codeium Integration:** AI-powered autocomplete
- **VS Code Compatibility:** All VS Code extensions work
- **Integrated Terminal:** Command line access within the editor
- **File Explorer:** Visual file and folder management
- **Debugger:** Built-in debugging tools
- **Git Integration:** Visual diff and commit tools

#### Why Use It?

- Write code faster with AI assistance
- Get instant help with errors and bugs
- Generate code from natural language descriptions
- Refactor and improve code with AI suggestions
- Explain complex code in plain English
- All the power of VS Code plus AI

#### Cascade in Action:

User: "Create a navigation component with mobile hamburger menu"

AI: Generates complete React component with:

- Desktop navigation bar
- Mobile hamburger menu
- Responsive design
- TypeScript types
- Styling with Tailwind CSS

#### Essential Shortcuts:

- `Ctrl/Cmd + L` - Open Cascade AI panel
- `Ctrl/Cmd + Shift + E` - Open Explorer
- `Ctrl+`` - Open Terminal
- `Ctrl/Cmd + P` - Quick file navigation
- `Ctrl/Cmd + Shift + F` - Search across files

---

## The AI Prompting Workflow

### Understanding Cascade (Windsurf's AI)

Cascade is your AI pair programmer. Access it:

- **Shortcut:** `Ctrl/Cmd + L`
- **Command:** Type `@` to reference files
- **Context:** AI sees your current file and workspace

### The Vibe-Coding Loop

1. PROMPT → Describe what you want
2. REVIEW → AI suggests changes
3. ACCEPT → Apply the changes
4. TEST → See if it works
5. ITERATE → Refine with follow-up prompts

---

## Project Lifecycle with AI

### Phase 1: Project Initialization with AI

#### Prompt:

```
Create a new Next.js project with:  
- TypeScript support  
- Tailwind CSS for styling  
- App Router enabled  
- shadcn/ui components  
- Dark mode support  
- A hero section on the home page  
- Navigation with links to Home, About, and Contact
```

#### What Cascade Does:

1. Runs `npx create-next-app@latest`
2. Configures TypeScript and Tailwind
3. Installs shadcn/ui
4. Sets up dark mode with next-themes
5. Creates initial page components
6. Builds a responsive navigation

#### Your Action:

- Review each file Cascade creates
- Accept or reject changes
- Ask for modifications if needed

---

### Phase 2: Building Features with Prompts

#### Example 1: Creating a Hero Section

**Prompt:**

```
Create a hero section for the home page with:
- Large headline: "Build Faster with AI"
- Subheadline explaining our service
- Call-to-action button "Get Started"
- Background gradient animation
- Responsive design for mobile
- Use framer-motion for subtle entrance animations
```

**Cascade Generates:**

- `app/components/hero.tsx`
- Animations with Framer Motion
- Responsive Tailwind classes
- Gradient background component

**Example 2: Building a Contact Form**

**Prompt:**

```
Create a contact form on the contact page with:
- Fields: name, email, message
- Form validation using React Hook Form and Zod
- Submit button with loading state
- Success message after submission
- Send data to /api/contact endpoint
- Styled with Tailwind and shadcn Input components
```

**Cascade Generates:**

- Form component with validation
- API route for form submission
- Error handling
- Loading states
- Success feedback

**Example 3: Adding a Portfolio Gallery**

**Prompt:**

```
Add a portfolio section to showcase projects:
- Grid layout with 3 columns on desktop, 1 on mobile
- Each card shows project image, title, description
- Hover effects with scale and shadow
- Click to open project details in a modal
- Use project data from a projects.ts file
- Include featured project: Raccoon Muncher game at raccoon-muncher.vercel.app
```

**Cascade Generates:**

- Portfolio grid component
- Project card with hover effects
- Modal for project details
- Data structure for projects

- Responsive grid layout
- 

## Phase 3: Styling and Refinement

### Prompt for Design System

#### Prompt:

```
Create a consistent design system:  
- Color palette: primary red (#DC2626), dark gray for backgrounds  
- Typography scale using Tailwind defaults  
- Button variants: primary (red), secondary (outline), ghost  
- Card component with border and hover effects  
- Spacing consistency (4px grid)  
- Apply to all existing components
```

#### Cascade:

- Updates `tailwind.config.ts` with custom colors
- Creates reusable button component
- Standardizes spacing across components
- Applies design system to existing pages

### Prompt for Responsive Design

#### Prompt:

```
Make the entire website fully responsive:  
- Mobile-first approach  
- Navigation becomes hamburger menu on mobile  
- Hero text scales down on smaller screens  
- Grid layouts collapse to single column  
- Test breakpoints: sm (640px), md (768px), lg (1024px)  
- Ensure no horizontal scrolling
```

---

## Phase 4: Adding Interactivity

### Prompt for Animations

#### Prompt:

```
Add scroll animations throughout the site:  
- Fade in sections as user scrolls  
- Stagger animation for list items  
- Smooth scroll to sections  
- Use Framer Motion or AOS library  
- Keep animations subtle and professional
```

### Prompt for State Management

#### Prompt:

```
Add a theme toggle (light/dark mode):  
- Toggle button in navigation
```

- Persist user preference in localStorage
- Apply dark: variants to all components
- Smooth transition between themes
- Use next-themes for SSR compatibility

---

## Advanced AI Prompting Techniques

### 1. Progressive Disclosure

Start broad, then narrow down:

#### Step 1 - Broad:

Create an about page for my digital agency

#### Step 2 - Specific:

Add to the about page:

- Team section with 3 member cards
- Each card has photo, name, role, and short bio
- Photos use placeholder avatar
- Grid layout: 3 columns desktop, 1 column mobile

#### Step 3 - Polish:

Add hover effects to team cards:

- Scale up slightly on hover
- Show social icons (LinkedIn, Twitter) on hover
- Smooth transition animations

### 2. Reference Existing Code

Use `@` to point to specific files:

Update `@app/page.tsx` to include a testimonials section below the hero.  
Use the same card style as `@components/ui/card.tsx`.

### 3. Context-Aware Prompts

Cascade remembers previous context:

Follow-up: Also add a pricing section with 3 tiers:

- Basic: \$99/month
- Pro: \$199/month
- Enterprise: Contact us

Use the same styling as the features section we just created.

### 4. Debug with AI

When something breaks:



**Prompt:**

```
The build is failing with this error:  
"Type error: Cannot find name 'Badge'"  
  
Fix the import issue in @client/src/pages/home.tsx
```

**Cascade:**

- Identifies the missing import
- Adds `import { Badge } from "@components/ui/badge"`
- Explains why the error occurred

## 5. Refactoring Prompts

**Prompt:**

```
Refactor the navigation component:  
- Extract mobile menu into separate component  
- Use custom hook for menu state  
- Add TypeScript interfaces  
- Keep all existing functionality
```

---

## From Prompt to Production

### The Complete AI-Guided Workflow

#### Step 1: Initial Setup (AI-Powered)

```
Prompt: "Initialize a Next.js project with all the modern defaults"
```

**Cascade Actions:**

- Creates project structure
- Sets up TypeScript
- Configures Tailwind
- Initializes shadcn/ui
- Creates basic layout

#### Step 2: Build Core Pages (Iterative Prompting)

```
Prompt 1: "Create a landing page with hero, features grid, and CTA"  
Prompt 2: "Add an about page with company story and team"  
Prompt 3: "Build a contact page with form and map"
```

#### Step 3: Add Features (Specific Prompts)

```
Prompt: "Add a blog section with:  
- List of posts on /blog  
- Individual post pages at /blog/[slug]  
- MDX support for rich content  
- Syntax highlighting for code blocks"
```

#### Step 4: Polish and Optimize

Prompt: "Optimize the site for production:

- Add SEO meta tags to all pages
- Generate sitemap.xml
- Add loading states
- Optimize images with next/image
- Add analytics integration"

#### Step 5: Deploy to Vercel

Prompt: "Help me deploy this to Vercel:

- Connect to GitHub repository
- Set up automatic deployments
- Configure environment variables
- Add custom domain (optional)"

#### Cascade guides you through:

1. Creating GitHub repo
2. Pushing code
3. Importing to Vercel
4. Configuring settings
5. Deploying

---

## Best Practices for AI Collaboration

### DO:

#### ✅ Be Specific

Good: "Create a blue primary button with white text, rounded corners, that changes to darker blue on hover"

Vague: "Make a button"

#### ✅ Provide Context

Good: "Following the design system in @tailwind.config.ts, create a card component with our brand colors"

#### ✅ Iterate Incrementally

Prompt 1: "Create basic form structure"

Prompt 2: "Add validation to the form"

Prompt 3: "Style the form errors"

#### ✅ Review AI Output

- Check for security issues
- Verify TypeScript types

- Test functionality

### ✅ Learn from AI

Prompt: "Explain how the useEffect hook works in the component you just created"

### DON'T:

- ❌ **Don't blindly accept** - Always review AI-generated code
  - ❌ **Don't make prompts too complex** - Break into smaller tasks
  - ❌ **Don't ignore errors** - Ask AI to explain and fix issues
  - ❌ **Don't skip testing** - Verify locally before pushing
- 

## Prompt Templates by Task

### Website Structure

```
Create a [business type] website with:  
- Home page with hero, features, testimonials, CTA  
- About page with story and team  
- Services page with [number] service cards  
- Contact page with form and contact info  
- Navigation and footer on all pages  
- Responsive design  
- [Color scheme] color palette
```

### Component Creation

```
Create a [component name] component that:  
- Accepts props: [list props]  
- Renders: [describe output]  
- Has states: [list states]  
- Uses: [specific libraries if any]  
- Matches style: [reference existing components]
```

### API Integration

```
Create an API route at /api/[endpoint] that:  
- Accepts [method] requests  
- Validates [input data]  
- Connects to [service/database]  
- Returns [response format]  
- Handles errors with [error format]
```

### Styling Tasks

```
Apply these design updates:  
- Color scheme: [colors]
```

- Typography: [font preferences]
- Spacing: [spacing scale]
- Components to update: [list]
- Breakpoints: [responsive requirements]

## Bug Fixes

Fix this issue: [describe problem]  
Error message: [paste error]  
File: @[file path]  
Expected behavior: [what should happen]  
Current behavior: [what actually happens]

---

## Troubleshooting with AI

### Common Scenarios

#### Build Error - Missing Import

**Error:** Module not found: Can't resolve '@components/ui/button'

**Prompt:**

Fix this import error in @app/page.tsx:  
"Cannot find module '@components/ui/button'"

Check if the file exists and fix the import path.

#### TypeScript Error

**Error:** Type 'string' is not assignable to type 'number'

**Prompt:**

Fix the TypeScript error in @[file]:  
"Type 'string' is not assignable to type 'number'"

The error is on line [X]. Convert the value properly.

#### Styling Issue

**Problem:** Component not responsive on mobile

**Prompt:**

The hero section looks bad on mobile (under 768px).  
Current issues: [describe]

Fix the responsive design using Tailwind breakpoints.

#### Deployment Issue

**Problem:** Vercel build fails

**Prompt:**

```
The Vercel deployment is failing with:  
[paste build log]  
  
Identify the issue and provide the fix.
```

---

## Example: Complete Project Walkthrough

### Project: Digital Agency Website

#### Step 1: Setup

**Prompt:**

```
Create a new Next.js project called "digital-agency" with:  
- TypeScript  
- Tailwind CSS  
- shadcn/ui  
- App Router  
- Dark mode support  
- Place it in ~/projects/
```

#### Step 2: Home Page

**Prompt:**

```
In the digital-agency project, create a home page with:  
1. Navigation with logo and links (Home, Services, About, Contact)  
2. Hero section:  
  - Headline: "We Build Digital Experiences"  
  - Subheadline about web development services  
  - CTA button linking to /contact  
  - Animated background  
3. Features section with 3 cards:  
  - Web Design  
  - Development  
  - Marketing  
4. Testimonials slider with 3 quotes  
5. Footer with contact info and social links
```

#### Step 3: Services Page

**Prompt:**

```
Create a services page at /services with:  
- Page title and description  
- 6 service cards in a 3x2 grid:  
  1. Web Design (icon: Palette)  
  2. Development (icon: Code)  
  3. SEO (icon: Search)  
  4. Marketing (icon: TrendingUp)  
  5. Branding (icon: Brush)
```

6. Support (icon: Headphones)

- Each card: icon, title, description, learn more link
- Consistent styling with home page features

#### Step 4: About Page

##### Prompt:

Create an about page with:

- Company story section with text and image
- Mission statement
- Team section:
  - 4 team members
  - Circular photos
  - Names and roles
  - Social media links
- Timeline of company milestones
- Values section with icons

#### Step 5: Contact Page

##### Prompt:

Create a contact page with:

- Contact form:
  - Name (required)
  - Email (required, validated)
  - Phone (optional)
  - Message (required, textarea)
  - Submit button
- Contact information sidebar:
  - Address
  - Phone
  - Email
  - Business hours
- Map placeholder (we'll add real map later)
- Form validation with error messages
- Success state after submission

#### Step 6: Polish

##### Prompt:

Polish the entire website:

1. Add smooth scroll behavior
2. Add page transition animations
3. Create a loading component
4. Add SEO meta tags to all pages
5. Ensure all links work correctly
6. Test responsive design on all pages
7. Optimize images with next/image

#### Step 7: Deploy

**Prompt:**

```
Help me deploy this digital-agency website:
1. Initialize git repository
2. Create GitHub repo and push
3. Deploy to Vercel with GitHub integration
4. Configure build settings
5. Set up custom domain (optional)

Provide the exact commands to run.
```

**Cascade provides:**

```
# Git setup
git init
git add .
git commit -m "Initial commit"
gh repo create digital-agency --public --source=. --push

# Vercel setup
vercel
# Follow prompts to link to GitHub and deploy
```

## Key Takeaways

### The Vibe-Coding Mindset

- 1. **Describe, Don't Write** - Use natural language to describe what you want
- 2. **Iterate Rapidly** - Make small prompts, review, refine
- 3. **Trust but Verify** - AI accelerates, but you guide quality
- 4. **Learn Continuously** - Ask AI to explain its choices
- 5. **Focus on Product** - Spend more time on user experience, less on syntax

### AI Collaboration Levels

Level	Your Role	AI Role
Beginner	Describe features	Writes all code
Intermediate	Design architecture	Implements components
Advanced	Set patterns & review	Assists with implementation
Expert	Strategic decisions	Accelerates execution

### Getting Started Today

- 1. **Install Windsurf** - Download from [codeium.com](#)
- 2. **Open a project** - Any existing or new folder
- 3. **Open Cascade** - Press `Ctrl/Cmd + L`
- 4. **Type your first prompt** - "Create a simple landing page"
- 5. **Iterate** - Keep refining with follow-up prompts

6. **Deploy** - Push to GitHub, deploy to Vercel

---

## Resources

### Prompt Libraries

- Keep a file of prompts that worked well
- Share prompts with your team
- Document which prompts produce best results

### Learning Path

1. Start with simple component prompts
2. Progress to full page generation
3. Learn to debug with AI
4. Master the iteration cycle
5. Build complete projects independently

### Community

- **Windsurf Discord** - Share prompts and tips
  - **GitHub Discussions** - Next.js and Vercel communities
  - **Twitter/X** - Follow #vibecoding for inspiration
- 

## Hands-On Exercises: Mastering the Windsurf Workflow

Complete these exercises to build muscle memory for common tasks. Each exercise includes step-by-step instructions and explains why the skill matters.

---

### Exercise 1: Creating a Workspace for a New Project

**Objective:** Set up a proper workspace structure for a portfolio website project.

**Steps:**

1. Open Windsurf
2. Click **File** → **Open Folder**
3. Navigate to **Documents** and create a new folder named **portfolio-exercise**
4. Select the folder and click **Open**
5. Once loaded, click **File** → **Save Workspace As...**
6. Save as **portfolio-exercise.code-workspace** in **Documents/Workspaces/**
7. Verify the workspace opens correctly by closing and reopening Windsurf

**Check Your Understanding:**

- Where is the **.code-workspace** file stored?
- What happens when you double-click a workspace file?

**Why This Matters:** Workspaces preserve your entire development environment—open files, terminal history, and settings. Without workspaces, you'd spend 5-10 minutes recreating your setup every time you switch projects. With workspaces, you jump straight into coding.

---

### Exercise 2: Accessing Previous Projects



**Objective:** Practice switching between multiple projects using workspace files.

**Steps:**

1. Create a second project folder: `Documents/blog-exercise`
2. Open it in Windsurf and save as `blog-exercise.code-workspace`
3. Close Windsurf completely
4. Navigate to `Documents/Workspaces/` in your file explorer
5. Double-click `portfolio-exercise.code-workspace`
6. Note: Portfolio project loads with all previous state
7. Switch projects: `File` → `Open Workspace from File...` → Select `blog-exercise.code-workspace`
8. Try the Recent menu: `File` → `Open Recent` → Switch back to portfolio

**Check Your Understanding:**

- How many recent workspaces does Windsurf remember?
- What's the fastest way to switch between two active projects?

**Why This Matters:** Developers often work on 3-5 projects simultaneously. Fast project switching means you can respond to client feedback on Project A, fix a bug on Project B, and resume feature work on Project C without losing context.

---

### Exercise 3: Using the Terminal to Run Next.js Locally

**Objective:** Start a Next.js development server and view your site locally.

**Prerequisites:** Node.js installed (v18+)

**Steps:**

1. Open your `portfolio-exercise` workspace
2. Open Terminal: Press `Ctrl+`` or `Terminal` → `New Terminal`
3. Verify Node.js: Type `node --version` and press Enter
4. Create Next.js project: `npx create-next-app@latest .`
5. Answer prompts:
  - TypeScript: Yes
  - ESLint: Yes
  - Tailwind CSS: Yes
  - `src` directory: Yes
  - App Router: Yes
  - Import alias: No
6. Wait for installation (2-5 minutes)
7. Start dev server: `npm run dev`
8. Open browser to `http://localhost:3000`
9. Make a small edit to `src/app/page.tsx`
10. Watch the browser auto-refresh
11. Stop server: Press `Ctrl+C` in terminal

**Check Your Understanding:**

- What URL do you use to view your local site?
- What command stops the server?
- What happens when you save a file?

**Common Terminal Commands:**

```
npm run dev      # Start development server
npm run build    # Build for production
npm start        # Start production server
Ctrl+C          # Stop running server
```

**Why This Matters:** Local development lets you test changes instantly before showing anyone. The dev server provides hot reloading (instant updates), error overlays, and source maps for debugging. This is your safe sandbox—break things here, not on the live site.

---

## Exercise 4: Understanding the Next.js Project Structure

**Objective:** Explore and understand the key files and folders in a Next.js project.

**Steps:**

1. With your portfolio project open, examine the Explorer panel
2. Open each folder and read the files:

**Explore These Files:**

Path	Purpose
src/app/page.tsx	Home page component
src/app/layout.tsx	Root layout (wraps all pages)
src/app/globals.css	Global CSS styles
public/	Static assets (images, fonts)
components/	Reusable React components
next.config.js	Next.js configuration
package.json	Dependencies and scripts
tsconfig.json	TypeScript settings

**Hands-On Exploration:**

1. Open `src/app/page.tsx` - this renders at `/`
2. Open `src/app/layout.tsx` - notice the `<html>` and `<body>` tags
3. Create a new folder: `src/app/about`
4. Create a file: `src/app/about/page.tsx`
5. Add this code:

```
export default function AboutPage() {
  return <h1>About Me</h1>
}
```

6. Visit `http://localhost:3000/about`

**Check Your Understanding:**

- Where do you put images you want to use?

- What file creates the `/about` route?
- What's the difference between `page.tsx` and `layout.tsx` ?

**Why This Matters:** Understanding the project structure lets you navigate confidently. You'll know where to add pages, where to put components, and which files control behavior. This mental model is essential for effective AI prompting—you need to reference the right files.

---

## Exercise 5: Setting Up `.env.local` and Understanding Environment Variables

**Objective:** Create and use environment variables for sensitive configuration.

### Steps:

1. In your project root, create a file named `.env.local`
2. Add these variables:

```
# Public variables (visible in browser)
NEXT_PUBLIC_SITE_URL=http://localhost:3000
NEXT_PUBLIC_SITE_NAME=My Portfolio

# Private variables (server only)
DATABASE_URL=your-database-url
API_SECRET_KEY=your-secret-key
ADMIN_EMAIL=admin@example.com
```

3. Save the file
4. Open `src/app/page.tsx`
5. Add this to display the public variable:

```
export default function Home() {
  return (
    <main>
      <h1>Welcome to {process.env.NEXT_PUBLIC_SITE_NAME}</h1>
      <p>Site URL: {process.env.NEXT_PUBLIC_SITE_URL}</p>
    </main>
  )
}
```

6. Verify you can see "My Portfolio" on the page
7. Check `.gitignore` - verify `.env.local` is listed
8. Try to access `process.env.DATABASE_URL` in the component - it will be undefined (correct behavior)

### Rules of Environment Variables:

- `NEXT_PUBLIC_` prefix = visible in browser
- No prefix = server-only, secure
- Never commit `.env.local` to Git (check `.gitignore` )
- Create `.env.example` with dummy values for team members

### Check Your Understanding:

- Why use `NEXT_PUBLIC_` prefix?
- What happens if you commit `.env.local` to Git?

- Where do private variables work vs public variables?

**Why This Matters:** Environment variables separate configuration from code. You can have different settings for development (local database) vs production (live database) without changing code. More importantly, they keep secrets (API keys, passwords) out of your code repository where others might see them.

**Real-World Usage:**

```
# .env.local (never commit this)
NEXT_PUBLIC_STRIPE_PUBLISHABLE_KEY=pk_test...
STRIPE_SECRET_KEY=sk_test...
NEXTAUTH_SECRET=random-string
ADMIN_PASSWORD=secure-password
```

## Exercise 6: Setting Up GitHub from Scratch

**Objective:** Create a GitHub account and understand the platform basics.

**Steps:**

1. Visit [github.com](https://github.com)
2. Click **Sign up** and complete registration
3. Verify your email address
4. Log in to GitHub
5. Click your profile picture (top right) → **Your repositories**
6. Click the green **New** button
7. Create a test repository:
  - Repository name: **learning-github**
  - Description: "My first GitHub repository"
  - Visibility: Public
  - Check **Add a README file**
  - Click **Create repository**
8. Explore the repository page:
  - Click on **README.md** to view it
  - Click the pencil icon to edit
  - Add a line: "I'm learning GitHub!"
  - Scroll down, add commit message: "Update README"
  - Click **Commit changes**
9. View the commit history by clicking the commit count

**Key GitHub Concepts:**

- **Repository:** Project folder with version history
- **README.md:** Project description shown on the main page
- **Commit:** Saved snapshot of changes
- **Public vs Private:** Who can see your code

**Check Your Understanding:**

- What's the difference between a repository and a folder?
- What does a README file do?
- Why write descriptive commit messages?

**Why This Matters:** GitHub is the world's code repository. It's where you store projects, collaborate with others, and showcase your work to employers. Without GitHub, your code lives only on your computer—lose that, lose everything. With GitHub, your code is backed up, shareable, and discoverable.

---

## Exercise 7: Connecting a Windsurf Project to GitHub

**Objective:** Link your local Next.js project to a GitHub repository.

**Prerequisites:** Git installed, GitHub account created

### Steps:

1. In Windsurf, open your `portfolio-exercise` project
2. Open Terminal ( `Ctrl+`` )
3. Initialize Git repository:

```
git init
```

4. Check status:

```
git status
```

(You'll see many untracked files in red)

5. Create a `.gitignore` file if it doesn't exist:

```
# Dependencies
/node_modules
/.pnp
.pnp.js

# Testing
/coverage

# Next.js
/.next/
/out/

# Production
/build

# Misc
.DS_Store
*.pem

# Debug
npm-debug.log*
yarn-debug.log*
yarn-error.log*

# Local env files
.env*.local
.env
```

```
# Vercel
.vercel

# TypeScript
*.tsbuildinfo
next-env.d.ts
```

6. Stage all files:

```
git add .
```

7. Make your first commit:

```
git commit -m "Initial commit: Next.js project setup"
```

8. Go to GitHub and create a new repository named `portfolio-exercise` (don't initialize with README)

9. Copy the repository URL (e.g., `https://github.com/yourusername/portfolio-exercise.git`)

10. Connect local to remote:

```
git remote add origin https://github.com/yourusername/portfolio-exercise.git
git branch -M main
git push -u origin main
```

11. Refresh your GitHub page - code is now there!

#### Daily Git Workflow:

```
git status          # Check what's changed
git add .           # Stage all changes
git commit -m "Description" # Save with message
git push            # Upload to GitHub
```

#### Check Your Understanding:

- What's the purpose of `git init` ?
- Why do we need `.gitignore` ?
- What does `git push` do?

#### Troubleshooting:

- **Error:** "fatal: not a git repository" → Run `git init` first
- **Error:** "Permission denied" → Check GitHub credentials
- **Error:** "Updates were rejected" → Run `git pull` first, then push

**Why This Matters:** Git is your safety net and collaboration tool. It tracks every change, so you can:

- Revert mistakes instantly
  - See who changed what and when
  - Work on multiple features simultaneously
  - Collaborate without overwriting each other's work
  - Deploy specific versions to production
-

## Exercise 8: Connecting a GitHub Project to Vercel

**Objective:** Deploy your GitHub repository to Vercel for automatic hosting.

**Prerequisites:** GitHub repository with code, Vercel account

### Steps:

1. Visit [vercel.com](https://vercel.com)
2. Click `Sign Up` → Choose `Continue with GitHub`
3. Authorize Vercel to access your GitHub account
4. On Vercel dashboard, click `Add New...` → `Project`
5. Find your `portfolio-exercise` repository and click `Import`
6. Configure project:
  - Framework Preset: Next.js (auto-detected)
  - Root Directory: `./`
  - Build Command: `next build` (default)
  - Output Directory: `.next` (default)
7. Click `Deploy`
8. Wait for build (2-3 minutes)
9. Click the URL (e.g., `portfolio-exercise-xxx.vercel.app` )
10. Your site is live on the internet!

### Understanding the Integration:

- Vercel watches your GitHub repository
- Every push to `main` triggers automatic redeployment
- Preview deployments are created for pull requests
- Your `.env.local` variables need to be added in Vercel dashboard

### Setting Environment Variables on Vercel:

1. Go to Vercel Dashboard → Select your project
2. Click `Settings` tab → `Environment Variables`
3. Add each variable from your `.env.local` :
  - Name: `NEXT_PUBLIC_SITE_NAME`
  - Value: `My Portfolio`
4. Click `Save`
5. Redeploy for changes to take effect

### Check Your Understanding:

- What happens when you push changes to GitHub?
- Where do you set production environment variables?
- How long does deployment typically take?

**Why This Matters:** Vercel turns Git pushes into live websites automatically. No manual uploads, no FTP, no server configuration. This enables:

- Continuous deployment: Code changes → Live site in minutes
  - Preview URLs: Test changes before merging
  - Rollbacks: Revert to previous versions instantly
  - Global CDN: Your site loads fast worldwide
  - HTTPS: Secure connections by default
-

## Exercise 9: Watching GitHub Push Updates to Vercel

**Objective:** Make a code change and watch it automatically deploy.

### Steps:

1. Ensure your project is deployed on Vercel from Exercise 8
2. In Windsurf, open `src/app/page.tsx`
3. Make a visible change:

```
export default function Home() {  
  return (  
    <main className="p-8">  
      <h1 className="text-3xl font-bold text-blue-600">  
        My Portfolio - Updated!  
      </h1>  
      <p>This change was pushed to GitHub and auto-deployed to Vercel.</p>  
    </main>  
  )  
}
```

4. Save the file
5. Open Terminal
6. Stage and commit:

```
git add .  
git commit -m "Update homepage with new heading"
```

7. Push to GitHub:

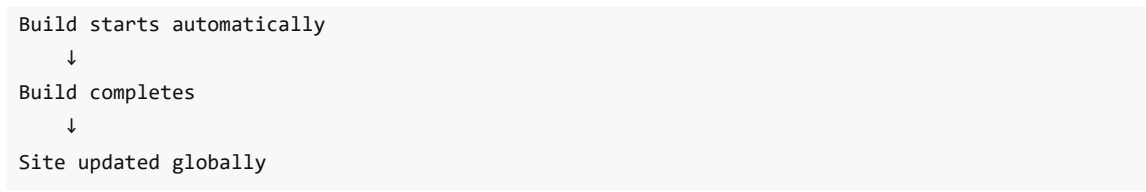
```
git push
```

8. Watch the magic happen:
  - Go to your GitHub repository
  - Click `Actions` tab (see commit being processed)
  - Go to Vercel dashboard
  - Click on your project
  - Watch the build progress indicator
9. Once build completes (green checkmark), visit your live URL
10. See your changes live on the internet!

### Understanding the Pipeline:

```
Local Code Change  
↓  
git commit & git push  
↓  
GitHub receives commit  
↓  
Vercel detects change  
↓
```





**Check Your Understanding:**

- How long did the deployment take?
- Where can you see the build status?
- What happens if the build fails?

**Exploring Build Logs:**

1. In Vercel dashboard, click on a deployment
2. Click `Build Logs`
3. See every step: installing dependencies, building, optimizing
4. If something fails, the error appears here

**Why This Matters:** This workflow—code, commit, push, auto-deploy—is the modern standard. It eliminates:

- Manual file uploads
- "It works on my machine" problems
- Fear of deploying (easy rollbacks)
- Downtime during updates

You can make a fix, push it, and have it live in 2 minutes. Clients see updates instantly. Bugs get fixed fast. This velocity is what makes modern web development so powerful.

**Exercise Summary: Why Each Step Matters**

Exercise	Skill	Why It Matters
1. Workspaces	Project organization	Saves 5-10 minutes per context switch, preserves mental state
2. Accessing Projects	Navigation	Enables managing multiple projects without friction
3. Local Dev Server	Development environment	Safe sandbox for experimentation with instant feedback
4. Project Structure	Code navigation	Know where everything lives; reference files correctly in prompts
5. Environment Variables	Security & configuration	Keep secrets safe, deploy to multiple environments
6. GitHub Setup	Version control	Backup, collaboration, history, portfolio showcase
7. Git Integration	Code management	Track changes, collaborate, deploy specific versions
8. Vercel Connection	Deployment	Turn code into live websites automatically
9. CI/CD Pipeline	Modern workflow	Ship changes fast, iterate rapidly, deploy confidently

**The Big Picture:** These exercises teach the complete modern development cycle:

1. **Plan** → Define what you're building (Exercise 5 planning template)
2. **Develop** → Build locally with instant feedback (Exercises 1-4)
3. **Secure** → Manage configuration safely (Exercise 5)
4. **Version** → Track changes with Git (Exercise 7)
5. **Store** → Back up on GitHub (Exercise 6)
6. **Deploy** → Go live with Vercel (Exercise 8)
7. **Iterate** → Rapid improvement cycle (Exercise 9)

Master these 9 exercises, and you have the foundational skills to build and deploy any web application using AI assistance.

---

## Conclusion

Vibe-coding with Windsurf, GitHub, and Vercel transforms web development from manual coding to collaborative creation. By mastering AI prompting, you can:

- **Build faster** - Prototypes in hours, not days
- **Explore more** - Try ideas without technical barriers
- **Focus on value** - Spend time on user experience
- **Ship confidently** - AI-assisted code + automated deployment

**Your new workflow:**

Prompt → AI Generates → You Review → Iterate → Push → Auto-Deploy

Start your first AI-powered project today!

---

**Document Version:** 2.3 - Complete with Hands-On Exercises **Last Updated:** March 2025