LLM Code Generation For Demo Creation

TIM 175 WEEK 5 PRELAB

So far we have covered how to create reliable prompts, evaluate them, and chain them together into workflows. This week we will explore practical applications of prompting for generating code to quickly turn ideas into simple demos. **This individual prelab is due Tuesday 11:59pm.**

Readings: We mark readings with a ⭐that we suggest you read

- Paper2Code: Automating Code Generation from Scientific Papers in Machine Learning ⭐
- **Twitter demos:** ⭐
    - **https://x.com/minchoi/status/1906841667749183611**
    - **https://x.com/emollick/status/1910534521998487709**

Submission Link
Week 5 TIM 175 Submission Form (Spring 2025)

Brief Task Overview
Complete the following activities to understand methods for creating demos with LLMs:

1. Set up your Bolt account
2. Create a one-shot prompt to generate a YouTube homepage
3. Customize your Youtube like homepage with follow-up prompts
4. Explore other demo-creation tools including v0, replit, Gemini, and ChatGPT
5. Brainstorm an idea for a new demo
6. Generate and iterate on your demo

You can use ChatGPT or other GenAI tools to inform any part of the assignment but: (1) you need to first form your own independent thoughts, (2) every word included in the submission needs to be something you've read, thought about, and decided to include, and (3) you should strive towards submitting the highest quality work you can rather than mediocre work that meets the requirements.

Creating Demos With LLMs

All of the prompts you have made so far have focused on understanding and generating natural language, in our case, English. However, most modern LLM foundation models have been trained to be able to understand and generate code as well. We can leverage this fact to generate powerful demos to help visualize and showcase ideas.

Note: Demos are a great medium for LLMs, as not everything needs to work perfectly all the time. You should always be careful when using LLM generated code for production level projects.

There are a couple types of tools you may use when creating demos:

1. Traditional general-purpose chat app experiences (like ChatGPT, Claude, or Gemini) have gotten steadily better at code generation, but they often are not integrated with the actual environments for running or editing code. Thus, they are typically more useful for brainstorming ideas, getting detailed explanations for specific blocks of code, or help with debugging,
2. Newer tools (like v0, Bolt, or replit) or newer features within general-purpose chat apps (like Gemini Canvas or ChatGPT Canvas) are designed specifically to support code generation. Since they have the ability to run the generated code, you can see the resulting user experience in real time.

Activity 1: Creating a Customized Copy of the YouTube Homepage

Bolt is a platform that lets you create interactive product demos quickly, no coding required! In this activity, you will create a demo of a YouTube homepage. Let's get started!

First, set up your Bolt account:

- Go to https://bolt.new/
- Create an account using your email

Task 1: Try a one-shot prompt

In Bolt, enter the prompt "Please create a YouTube-like homepage". Take note of what happens next, and how it differs from entering a prompt into traditional LLM-powered chatbots.

Task 2: Customize your homepage

WARNING: Bolt does have a limit of **150K tokens per day**! Be mindful of this as you create your homepage. You can check the amount of tokens you have used in Settings > Tokens

Using follow-up prompts, (don't start a new chat) make the following changes:

1. Change the background color of the page
2. Change the site title
3. Change the number of videos per row
4. Add an explosion of confetti whenever the mouse is clicked

Once you've made all these modifications, implement 2 additional changes. These can be similar to the ones above, or something completely different. Get creative!

Tip: If any of your prompts end up breaking previous changes, you can always revert to a previous version and try again.

Reflection: What is the advantage of using a site like Bolt vs traditional LLM-powered chatbots? What are the flaws?

Screenshot: Take screenshots of your final homepage and paste it below!

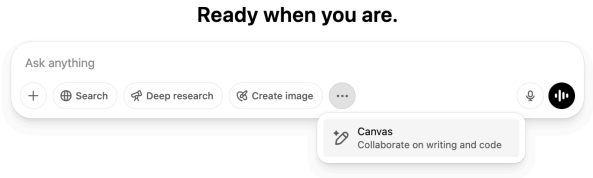
Activity 2: Explore Additional Tools

In addition to Bolt, there are a variety of similar tools you can use to create demos. Each will have its own strengths and weaknesses, so it's important to find a tool that works for you.

Task: Test Prompt on different sites:

Test the one-shot prompt "Please create a YouTube-like homepage" on each of the following tools:

- https://v0.dev
- https://replit.com
- https://gemini.google/overview/canvas
- https://chatgpt.com ← make sure to select ChatGPT-4o and "Canvas" from the chat box



Note: there are currently a lot of free plans for students who sign up soon. I'd highly recommend you to do so as it's a great opportunity: Gemini Advanced (till June 30), ChatGPT Plus (till May 31)

Reflection: Describe your experimentation with both tools? What was the experience like for the different tools? Which did you like best?

Activity 3: Create a Small Demo of Your Choosing

Now that you've had practice creating a demo, it's your turn to make a new demo from scratch! You can use whatever tool you'd like.

NOTE: If you ran out of tokens for Bolt, they should refresh at the end of the day and you can create the demo the next day. But you are welcome to use any of the other demo-creation tools for this activity.

Task 1: Create an idea for a demo

Take 5 minutes to brainstorm an idea for your own demo. This could be a website, game, data visualization, really anything you want. Try to create something unique, but if you can't think of anything you can draw inspiration from existing things (like we did above). You could also begin to explore visualizations that relate to the What-To-Be podcast annotation dataset we've been creating as this is what we will eventually be doing in the lab.

Task 2: Write a prompt to generate your demo

Once you have an idea nailed down, create a prompt that captures as many aspects as you can. Don't worry too much about implementing prompting techniques, since this prompt will only need to be run once it's ok for it to be simple. Once your prompt is written, try it out on any of the tools we've used thus far.

Initial Prompt:

Task 3: Iterate on your demo

Once your first draft is complete, play around with your demo and see how well the model did. After testing your demo, iterate on it by adding at least 3 follow-up prompts to get it closer to your initial idea.

Follow-Up Prompts:

1.
2.
3.

Reflection: How was the experience of turning a new idea into a demo? What was difficult? What went well?

Screenshot: Take Screenshots of your final demo and paste it below!

Submission Instructions:

After completing all the activities, fill out the submission form including a link to your copy of **this google document** on it.