



CS 90SI: CS+SOCIAL GOOD

USING WEB TECHNOLOGIES TO CHANGE THE
WORLD

Welcome to CS 90SI.

You will learn web development by working on real world projects focused on creating positive social impact. Students will work on small teams to implement high-impact projects for partner organizations. The aim of this class is to empower Stanford students to leverage technology for social good.

Each of the projects in this list has been carefully chosen by our team. We will keep on updating this list as we add more projects. Our project partners are super excited to be working with you and helping you solve big problems that matter.

Every project has 3 levels. The first level is called Level Kanye. Level Kanye is the minimum deliverable for any project to receive credit in the class. No Kanye. No credit. The second level is called Level Taylor. You reach Level Taylor when you create a genuinely exciting product building upon the minimum deliverable. The final or the third level is called Level Beyonce. You reach this level when you create something beyond anything we could have possibly imagined. You created something 'flawless'.

Our project partners have described their projects in the next few pages with their respective levels. We hope that you have as much fun reading them as we had compiling them.

Live long and prosper,

Team CS 90SI

GOVERNMENT OF DELHI PROJECT 1

Welcome to Delhi, the center of the world's largest democracy, and home to 20 million people. Delhi is a microcosm of the entire country. It's a city of government officials, corporate executives, lawyers, traders, teachers and students. It is also a home to millions of labourers, domestic workers, rickshaw pullers and street vendors. The Government of Delhi and the ruling political party, Aam Aadmi Party ("Aam Aadmi" means common man) have graciously allowed us to create the next generation of tools to ensure political accountability in the country. The Aam Aadmi Party is only 3 years old and has taken on the established national parties and beaten them using crowdsourced political funding, zero criminal candidates and disruptive social media strategy. You will help them in further their vision of transparent, responsive and accountable government, that truly is; by the people, for the people and of the people.

You will work with the government while creating your project and your work will directly impact millions of people.



LEVEL KANYE

Question Hour is the first hour of a sitting session of India's parliament devoted to questions that Members of Parliament raise about any aspect of administrative activity. The concerned Minister is required by law to answer to the Parliament. Aam Aadmi Party, the ruling party in Delhi, which also has 4 MPs in the National Parliament proposes a structured question maker for the parliament question hour where ordinary citizens can submit their questions to one of their 4 members of parliament who can then raise the asked question during the Question Hour. The form will potentially be used by hundreds of thousands of people to submit their questions to the government using the voice of the common man.



LEVEL TAYLOR

For political parties, elections mean placing their manifestos before the people as a statement of intent. Over time, party manifestos have been reduced to insincere pledges promising everything to everybody, with very little follow-up or delivery after attainment of power. It has made the common man lose faith in political processes. The Aam Aadmi Party-led Government of Delhi proposes a Manifesto Tracker to keep track of the promises made by the government in their election manifesto, similar to the Morsi Meter but going a few steps further. The manifesto tracker will be used by the government to inform the citizens of work in progress and get feedback on finished projects. This will truly democratize the political system, make government accountable to its people and make politics mean more than just elections.

GOVERNMENT OF DELHI

PROJECT 1

(continued)



LEVEL BEYONCE

The government of Delhi proposes a unified public grievance management system similar to the 311 helpline in New York. The citizens will be able to submit their grievance online in a simple form which we should be able to directly parse to understand what type of complaint it is, the department(s) involved etc. They should also be able to track their complaints, be given unique complaint IDs. On the government side, We should be able to store analytics on department(s) which receive the most complaints and create an accountability chain to figure out the people responsible for the grievance, if any and fix the issue as soon as possible.

Note: This project is significantly more complex than other projects. We understand this and we believe that this project will allow you to work on a very complex problem in a short period of time. We will also consider the complexity of this project in mind while grading your work.

Technical Requirements: HTML/CSS/ JavaScript, PhoneGap for app development, Heroku, git. There is not much existing code in this project. You will have complete freedom to choose a framework.

PROJECT OPPIA

Project Oppia started as a 20% project by some Google engineers. People learn better when they participate actively in the learning process (e.g. by doing things and getting feedback) than by passive exposure to videos and text, so why isn't there more of this sort of teaching on the Web? One reason is because there are few, if any, tools that make it easy for non-technical users to create, share, and improve such material. The

Oppia project by Google aims to fix this by making it easy for anyone to create interactive online activities simulating one-on-one tutoring conversations and share them in an open commons; we hope that this commons will grow steadily in terms of quality and coverage until it can meet most people's basic learning needs.

One of the big motivations for teaching is seeing students get 'aha' moments, because the impact is tangible. We want to make this impact tangible even when the creator isn't able to see the student. The CS90SI project we propose is to develop a profile page that allows contributors to get a sense of the impact they are having on others. We propose the following project tiers:



LEVEL KANYE

Add information to the profile page about explorations to which a user has contributed, as well as badges demonstrating their achievements, in order to help the user get a sense of the impact they're having and encourage them to create more learning material that helps others.



LEVEL TAYLOR

In addition, define, compute and display other 'deeper' statistics that may require more complicated backend calculations -- for example, some measure of how useful a user's feedback is, how responsive they are to feedback, whether the explorations they create are effective, etc.



LEVEL BEYONCE

In addition, think deeply and conduct user research to understand what would motivate creators to contribute to an open educational commons, and how to convey this motivation. Create highly-motivating profile pages that allow users to know that their work has really helped someone, and to know that their work has helped a lot of people.

Technical Requirements: Knowledge of how to use GitHub and the git source control system ; HTML, CSS and AngularJS; Bootstrap; Python and Google App Engine

SIRUM

Medication is the most cost effective way to treat most illnesses. Yet one-in-four working-age adults in the United States skip taking medication due to cost. According to the American College of Preventive Medicine, not taking prescription medicines costs our health system over \$100 billion dollars and results in 125,000 deaths each year. At the same time, \$5 billion of unopened, unexpired medication goes to waste each year in the U.S., destined for incinerators, landfills, or our waterways. As of 2014, Good Samaritan laws were enacted in 40 states to allow and protect the donation of this medication for the very first time.

SIRUM takes advantage of these new laws by sending boxes with prepaid shipping to nursing homes & pharmacies. These facilities put their unexpired, surplus medications into the box. SIRUM then makes sure that the right medicine goes directly to the right people. We make it easy to donate unused medicine because we know that saving medicine means saving lives.

SIRUM has a website that matches nursing homes and pharmacies with surplus medications with safety-net clinics in need of medications. Our patent-pending design allows clinics to create a wish list or “formulary” of medications that they want. When the nursing home or pharmacy has the requested medications, they see the matching clinics and can donate those medicines and track the donation from pickup to delivery. As part of our work, we often need to email or mail PDFs of shipping labels, shipping manifests, and thank you letters to our nursing homes and pharmacies. We need your help to generate these PDFs from html and then email and mail these PDFs using APIs.



LEVEL KANYE

Create a RESTful endpoint for creating and saving a PDF using HTML. Leverage PDFCrowd or PhantomJS-PDF to create the PDF from HTML and save it to the server. The PDF should be correctly formatted based on the included HTML, CSS, and JS. There should be the option to put the format the PDF on blank paper or on SIRUM letterhead. The service should be intuitive, fast, reliable, and use appropriate HTTP status codes accompanied by human readable message for both success and errors.



LEVEL TAYLOR

In addition to creating PDFs, allow these PDFs to be emailed. Create a RESTful endpoint for emailing our users, leveraging the nodemailer library. There should be an option to email one user or a group of users. There should also be an option to add attachments, including our generated PDFs. The service should be intuitive, fast, reliable, and use appropriate HTTP status codes accompanied by human readable message for both success and errors.

SIRUM (continued)



LEVEL BEYONCE

In addition to creating and emailing PDFs, allow these PDFs to be mailed. Create a RESTful endpoint for mailing our users, leveraging Lob.com's API. Lob will print and (postal) mail letters to our users based on our PDFs. There should be an option to mail one user or a group of users. The service should be intuitive, fast, reliable, and use appropriate HTTP status codes accompanied by human readable message for both success and errors.

Technical Requirements: Work with SIRUM to design and build a RESTful API for PDFs using Koa.js on Node.js. The API does not need to implement authentication.

LABORVOICES

LaborVoices is a social enterprise startup that is building a Glassdoor for workers in developing countries to rate their safety and working conditions anonymously using their basic mobile phones. Currently, LaborVoices is engaging workers across 200 apparel factories in Bangladesh and Turkey to rate their own factories, and sharing that data with factory management, brands, and workers, so that management can quickly identify and resolve problems, brands can identify the best factories to source from, and workers can identify the best factories to work for.

LaborVoices is seeking a Stanford team to work on visualizing our data for the public, as well as relevant 3rd party data. LaborVoices will be releasing data publicly in early 2016, and we are looking for a student team to design and build a mobile-friendly web application that we can use to publicly disseminate our data, with the goal of making our data easily accessible to workers in developing countries, as well as news organizations, and end consumers of apparel products in developed countries.



LEVEL KANYE

Build a Yelp-like web app, where users can find apparel factories on a map, and click on those factories to see our crowdsourced worker ratings, using data from the LaborVoices API. Display LaborVoices worker ratings and statistics on areas like: child labor, safety, abuse, wages, and overall worker satisfaction. Build basic search functionality, so users can search for factories by geographic area, and quickly find top-rated factories.



LEVEL TAYLOR

Research 3rd party data sources, looking for complementary data that adds insights to the data from LaborVoices. For example: public data on brands that source from specific factories, public audit inspection results, and other regional data that provides meaningful context for factory data in the portal. Add insights at a basic (static) level to the portal built in Level Kanye.



LEVEL BEYONCE

Extend the LaborVoices API to include data from 3rd party sources and update the web portal so that the insights and additions from Level Taylor are dynamically served from the API.

Technical Requirements: Ruby on Rails or Python (for web development), Python (for API development), Javascript (will require plots and charts for the UI - C3 (<http://c3js.org/>) a D3 base library is recommended), CartoDB is great for mapping!

GOVERNMENT OF DELHI PROJECT 2

Mystery, magic, marvel. Welcome to Delhi, the center of the world's largest democracy, and 20 million people. Modern Delhi is a beautiful tapestry of medieval fortifications, Mughal mausoleums, dusty bazaars, colonial-era town planning, and mega malls. Delhi is a city that bridges two different worlds. Old Delhi, once the capital of India, is a labyrinth of narrow lanes lined with crumbling havelis and formidable mosques. In contrast, the imperial city of New Delhi created by the British Raj is composed of spacious, tree-lined avenues and imposing government buildings. The city's importance lies not just in its past glory as the seat of empires and magnificent monuments, but also in the rich and diverse cultures. More importantly, Tourism is an important industry for millions of Delhi citizens who rely on it for their daily income.

The Government of Delhi has graciously allowed us to create the next generation of tools to promote the tourism sector in Delhi and empower the millions of livelihoods it nourishes.



LEVEL KANYE

Develop a sub-site for the Tourism Ministry of Delhi promoting A Heritage Walktober. Over 50 different walks have been charted out already taking anyone and everyone through the environmental, religious, historical, cultural, architectural and artistic marvels that Delhi has to offer. Walktober based on a similar initiative in Australia encourages people of all ages to walk and discover the rich culture and heritage of their cities.



LEVEL TAYLOR

Tourists who come to big cities like Delhi are often confused on where to begin or what to see. Develop an audio tour guide based on the Google Maps API so that any new visitor to the city can put on their headphones and travel through a new city. You can also include mentions to local businesses improving income of places which are not usually frequented by tourists.



LEVEL BEYONCE

Develop an all-new and much cooler version of the Delhi Tourism Website. You will have access to the Delhi Tourism code-base and team which has information, pictures, videos and assorted content curated already. With your newly honed web development skills, You are all set to redesign an already popular website and make it mobile - cloud - *insert all the buzz words here* friendly.