



# CS104 - Systems Software Lab Project Report

Token Generation System

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# Chapter 1

## Project Outline

### 1.1 Small Brief

This report presents the design and implementation of an appointment system for Varshith Hospital. The goal of the system is to efficiently manage appointments and send confirmation emails to patients. The appointment system is a web-based application developed using Google Apps Script, which integrates with Google Sheets and Gmail.

The appointment system is designed to handle appointments for three different locations and three different doctors. It allows patients to request appointments by filling out an online form. The system then assigns a time slot to the patient based on availability and sends them a confirmation email with a unique token number. The system also generates a list of appointments in a Google Sheets document for easy reference by hospital staff.

### 1.2 Emphasizing Customization

- Made it Location Specific
- Made it Gender Specific
- Made it Combined gender with location specific
- Made it Doctor specific
- Brought Tokenwise Patient list organised in new sheet
- Took reason to visit for hospital and made it Available for Doctors

## Chapter 2

# Information gathering

### 2.1 Google form

This project is about assigning tokens to a form filler and sending emails to them. The tokens here are for **Varshith Group Of Hospitals** (it is my name :). First it starts with filling a google form - [Appointment booking](#) of Varshith Hospitals. In that basic details such as name, gender, age etc are taken. Next it asks for “branch location” in which appointment is required as shown in [2.1a](#) and [2.1b](#).

The screenshot shows the top part of a Google Form titled "Appointment booking" for the Varshith Group of Hospitals. The header includes a white cross logo on a dark background and the hospital's name. Below the title, a note states that only 6 slots are available per doctor per location and provides contact information for email notifications. The form includes a "Switch accounts" link for the user "varshithmacbook@gmail.com". A red asterisk indicates required questions. The first visible field is "Email \*" with a checkbox option to "Record varshithmacbook@gmail.com as the email to be included with my response". Below this is the "Name \*" field.

(a) Screenshot 1

The screenshot shows the continuation of the Google Form. It features the "Gender \*" field with radio button options for "Male", "Female", and "Other:". Below this is the "Location of Hospital for appointment \*" field, which has radio button options for "Trunk Road Branch", "Gandhi Nagar Branch", "Balaji Nagar Branch", "Magunta Layout Branch", and "BV Nagar Branch". At the bottom of the form, there is a "Next" button, a "Clear form" link, and a footer that reads "Never submit passwords through Google Forms. This form was created inside Indian Institute of Technology Bombay. Report Abuse". The Google Forms logo is also present.

(b) Screenshot 2

Figure 2.1: Screenshots of Googleform

Later it goes to a section containing list of doctors based on their selection of branch location as shown in [2.2](#) .Then takes the problem of patient in optional way .That's it the form gets submitted.

Doctor list at Trunk Road Branch

Choose the Specialisation of Doctor for which you require the appointment.

Select the Doctor for whom you need appointment \*

☐ Dr. Nandan Manjunath (Cardiologist)
☐ Dr. Dheeraj Kurukunda (Psychiatrist)
☐ Dr. Umesh Karthikeya (ENT specialist)

Back

Next

Clear form

(a) doctors at TR branch

Doctor list at Gandhi Nagar Branch

Choose the Specialisation of Doctor for which you require the appointment.

Select the Doctor for whom you need appointment \*

☐ Dr. Venu (Cardiologist)
☐ Dr. Siva (Psychiatrist)
☐ Dr. Narendra (ENT specialist)

Back

Next

Clear form

(b) doctors at GN branch

Doctor list at Balaji Nagar Branch

Choose the Specialisation of Doctor for which you require the appointment.

Select the Doctor for whom you need appointment \*

☐ Dr. Sobha (Cardiologist)
☐ Dr. Madhavi (Psychiatrist)
☐ Dr. Radha (ENT specialist)

Back

Next

Clear form

(c) doctors at BN branch

Doctor list at Magunta Layout Branch

Choose the Specialisation of Doctor for which you require the appointment.

Select the Doctor for whom you need appointment \*

☐ Dr. Kishore (Cardiologist)
☐ Dr. Vani (Psychiatrist)
☐ Dr. Satyavathi (ENT specialist)

Back

Next

Clear form

(d) doctors at MG branch

Doctor list at BV Nagar Branch

Choose the Specialisation of Doctor for which you require the appointment.

Select the Doctor for whom you need appointment \*

☐ Dr. Sunnel (Cardiologist)
☐ Dr. Lavanya (Psychiatrist)
☐ Dr. Sanjana (ENT specialist)

☐ Send me a copy of my responses.

(e) doctors at BV branch

Medical Reason for Hospital Visit

This is an optional section.

Your answer

☐ Send me a copy of my responses.

Back

Submit

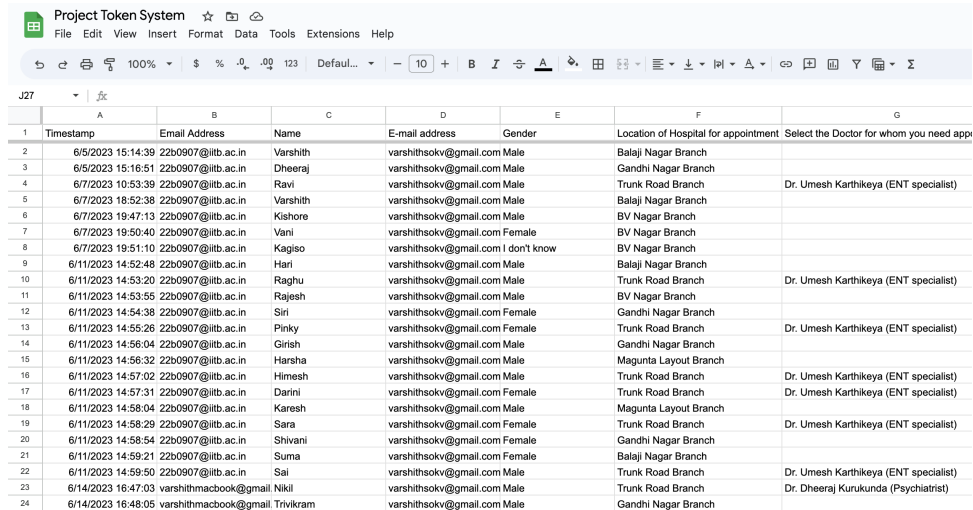
Clear form

(f) problem taking

Figure 2.2: list of doctors at each location

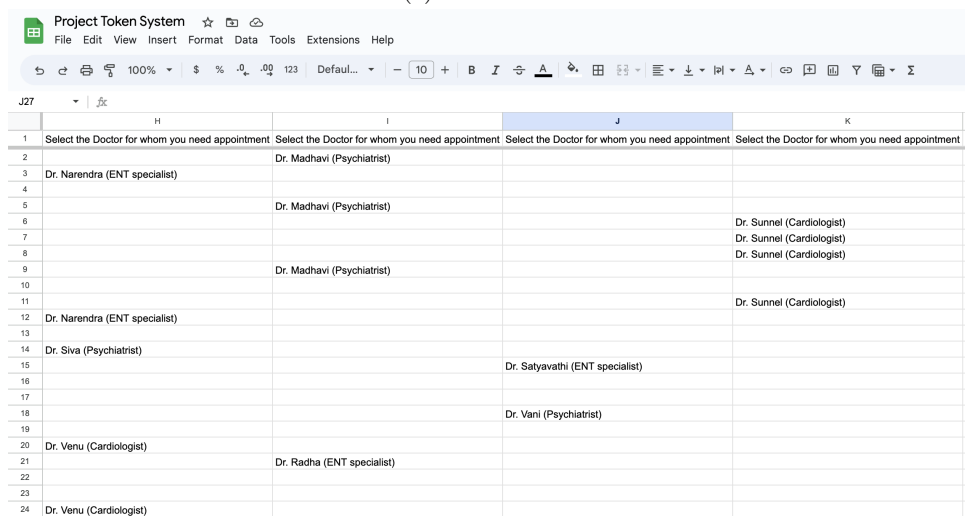
## 2.2 Google sheet

This information obtained from Googleform is gathered into GoogleSheet **Project Token System** in “Form Responses” sheet. It appears as shown in figure 2.3. The main thing to notice is that information regarding doctors at different locations are collected at different columns.



	A	B	C	D	E	F	G
1	Timestamp	Email Address	Name	E-mail address	Gender	Location of Hospital for appointment	Select the Doctor for whom you need app
2	6/5/2023 15:14:39	22b0907@iitb.ac.in	Varshith	varshithsovk@gmail.com	Male	Balaji Nagar Branch	
3	6/5/2023 15:16:51	22b0907@iitb.ac.in	Dheeraj	varshithsovk@gmail.com	Male	Gandhi Nagar Branch	
4	6/7/2023 10:53:39	22b0907@iitb.ac.in	Ravi	varshithsovk@gmail.com	Male	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
5	6/7/2023 18:52:38	22b0907@iitb.ac.in	Varshith	varshithsovk@gmail.com	Male	Balaji Nagar Branch	
6	6/7/2023 19:47:13	22b0907@iitb.ac.in	Kishore	varshithsovk@gmail.com	Male	BV Nagar Branch	
7	6/7/2023 19:50:40	22b0907@iitb.ac.in	Vani	varshithsovk@gmail.com	Female	BV Nagar Branch	
8	6/7/2023 19:51:10	22b0907@iitb.ac.in	Kagiso	varshithsovk@gmail.com	I don't know	BV Nagar Branch	
9	6/11/2023 14:52:48	22b0907@iitb.ac.in	Hari	varshithsovk@gmail.com	Male	Balaji Nagar Branch	
10	6/11/2023 14:53:20	22b0907@iitb.ac.in	Raghu	varshithsovk@gmail.com	Male	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
11	6/11/2023 14:53:55	22b0907@iitb.ac.in	Rajesh	varshithsovk@gmail.com	Male	BV Nagar Branch	
12	6/11/2023 14:54:38	22b0907@iitb.ac.in	Siri	varshithsovk@gmail.com	Female	Gandhi Nagar Branch	
13	6/11/2023 14:55:26	22b0907@iitb.ac.in	Pinky	varshithsovk@gmail.com	Female	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
14	6/11/2023 14:56:04	22b0907@iitb.ac.in	Grish	varshithsovk@gmail.com	Male	Gandhi Nagar Branch	
15	6/11/2023 14:56:32	22b0907@iitb.ac.in	Harsha	varshithsovk@gmail.com	Male	Magunta Layout Branch	
16	6/11/2023 14:57:02	22b0907@iitb.ac.in	Himesh	varshithsovk@gmail.com	Male	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
17	6/11/2023 14:57:31	22b0907@iitb.ac.in	Darini	varshithsovk@gmail.com	Female	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
18	6/11/2023 14:58:04	22b0907@iitb.ac.in	Karesh	varshithsovk@gmail.com	Male	Magunta Layout Branch	
19	6/11/2023 14:58:29	22b0907@iitb.ac.in	Sara	varshithsovk@gmail.com	Female	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
20	6/11/2023 14:58:54	22b0907@iitb.ac.in	Shivani	varshithsovk@gmail.com	Female	Gandhi Nagar Branch	
21	6/11/2023 14:59:21	22b0907@iitb.ac.in	Suma	varshithsovk@gmail.com	Female	Balaji Nagar Branch	
22	6/11/2023 14:59:50	22b0907@iitb.ac.in	Sai	varshithsovk@gmail.com	Male	Trunk Road Branch	Dr. Umesh Karthikeya (ENT specialist)
23	6/14/2023 16:47:03	varshithmacbook@gmail	Nikil	varshithsovk@gmail.com	Male	Trunk Road Branch	Dr. Dheeraj Kurukunda (Psychiatrist)
24	6/14/2023 16:48:05	varshithmacbook@gmail	Trivikram	varshithsovk@gmail.com	Male	Gandhi Nagar Branch	

(a) Screenshot 1



	H	I	J	K
1	Select the Doctor for whom you need appointment	Select the Doctor for whom you need appointment	Select the Doctor for whom you need appointment	Select the Doctor for whom you need appointment
2		Dr. Madhavi (Psychiatrist)		
3	Dr. Narendra (ENT specialist)			
4				
5		Dr. Madhavi (Psychiatrist)		
6				Dr. Sunnel (Cardiologist)
7				Dr. Sunnel (Cardiologist)
8				Dr. Sunnel (Cardiologist)
9		Dr. Madhavi (Psychiatrist)		
10				
11				Dr. Sunnel (Cardiologist)
12	Dr. Narendra (ENT specialist)			
13				
14	Dr. Siva (Psychiatrist)			
15			Dr. Satyavathi (ENT specialist)	
16				
17			Dr. Vani (Psychiatrist)	
18				
19				
20	Dr. Venu (Cardiologist)			
21		Dr. Radha (ENT specialist)		
22				
23				
24	Dr. Venu (Cardiologist)			

(b) Screenshot 2

Figure 2.3: Screenshots of Googlesheet

## Chapter 3

# Code execution

To get the functionality follow the steps described below

1. First open the googlesheet with information about form fillers.
2. Then select “**Extensions**” and select “**Apps Script**” as shown in below figure 3.1 .

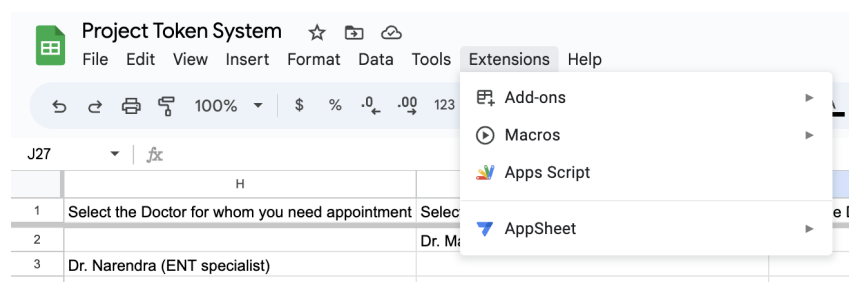


Figure 3.1: Screenshot of Googlesheet

3. Find Javascript code in **code-folder** folder in **22b0907\_project** folder. Then paste the code which is in “.js” file.
4. Select the “**token\_system**” in the functions list as shown in 3.2 .
5. Then click “**Run**” button shown in below figure 3.2 to execute the code.
6. The two lines as “**Execution started**” and “**Execution completed**” in Execution log confirms the successful execution.
7. This completes the execution of the code.

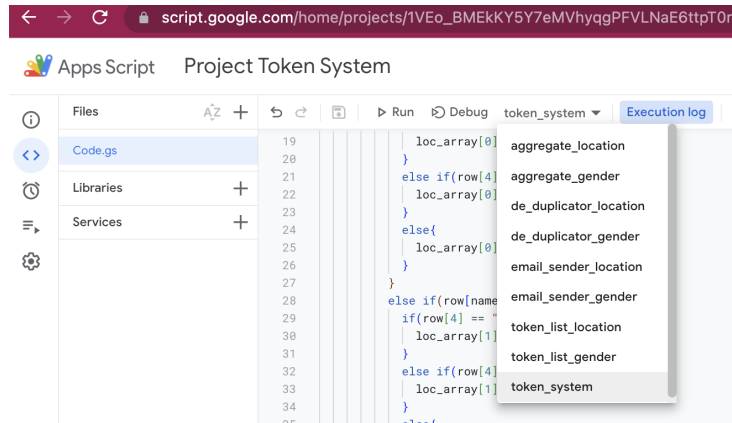


Figure 3.2: Screenshot of Apps Script



Figure 3.3: Screenshot of Execution log



## Chapter 4

# Code description

### 4.1 Implementation Details

The appointment system is implemented using several functions in Google Apps Script. The main function, `token_system`, serves as the entry point and manage the different steps involved in the appointment process. Here are the key functions used:

- **`aggregate_location`**: This function reads the appointment data from the Google Sheets document and separates it into corresponding arrays based on location and doctor names. This allows for efficient organization and processing of the appointments.
- **`aggregate_gender`**: Similar to **`aggregate_location`**, this function additionally separates the appointment data based on the gender of the patients. This can be useful for generating reports or statistics based on gender demographics.
- **`de_duplicator_location`**: This function removes any duplicate entries for the same person at a given branch. It ensures that each patient is assigned only one appointment slot, avoiding any confusion or duplication.
- **`de_duplicator_gender`**: Similar to **`de_duplicator_location`**, this function removes duplicate entries for the same person at a given branch and gender. It helps maintain fairness and avoids bias in appointment assignments.
- **`email_sender_location`**: This function sends appointment confirmation emails to patients based on their selected location. It retrieves the patient's email address from the Google Sheets document and uses Gmail services to send personalized emails containing the appointment details.
- **`email_sender_gender`**: Similar to **`email_sender_location`**, this function sends appointment confirmation emails based on location and gender. It allows for personalized communication and ensures that patients receive relevant information.
- **`token_list_location`**: This function generates the appointment list in the Google Sheets document, specifically in the "Slots" sheet. It writes the patient's name, appointment date and time, doctor's name, and token number in an organized manner for easy reference by hospital staff.
- **`token_list_gender`**: Similar to **`token_list_location`**, this function generates the appointment list based on location and gender. It provides a more granular view of the appointments, enabling analysis based on gender-specific trends or patterns.

## Chapter 5

# References

- I have used the reference [1] given in problem statement to get familiarise with Google Apps Script API.
- Then the references [2] and [3] which were also given in problem statement to automated Gmail sending mechanism using Apps Script. But used [3] for the final project
- Used [5] to learn about Javascript arrays
- Used stackoverflow very much for syntax errors but mentioning one of reference [4] used to add data to google sheet using Apps Script.

# Bibliography

- [1] Olatunde Garuba. *Google Apps Script Automated Emails*. <https://www.codementor.io/@olatundegaruba/google-apps-script-automated-emails-m2m0ojq9v>. Accessed: 2023.
- [2] Google. *Google Sheets API Concepts*. <https://developers.google.com/sheets/api/guides/concepts>. Accessed: 2023.
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- [4] *Stackoverflow*. URL: <https://stackoverflow.com/questions/23467876/insert-a-cell-in-google-spreadsheet-using-google-apps-script>.
- [5] *W3Schools*. URL: [https://www.w3schools.com/js/js\\_arrays.asp](https://www.w3schools.com/js/js_arrays.asp).