

# Sugarizer Exercise Activity

## About Me

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### **What is your name?**

My name is Mankirat Singh. I am a 3<sup>rd</sup> year undergraduate student at Bharati VidyaPeeth's College of Engineering, New Delhi, India.

My profile Link: <https://manki11.github.io>

### **What is your email address?**

My email address is [mankirat.work@gmail.com](mailto:mankirat.work@gmail.com).

### **What is your IRC nickname on irc.freenode.net?**

My IRC nickname is manki11.

### **What is your Sugar Labs Wiki username?**

My Sugar Labs Wiki username is Mankill.

### **What is your first language? (We have mentors who speak multiple languages and can match you with one of them if you'd prefer.)**

My first language of communication is English. I am also fluent in Hindi.

### **Where are you located, and what hours (UTC) do you tend to work? (We also try to match mentors by general time zone if possible.)**

I am located in New Delhi, India and my time zone is Indian Standard Time (UTC + 5:30). I am planning to work from 6:00 to 14:00 (UTC) but my timings are flexible. I'm very excited to work on this project during the summer and I can surely manage my time and be active when the mentors are available.

**Have you participated in an open-source project before? If so, please send us URLs to your profile pages for those projects, or some other demonstration of the work that you have done in open-source. If not, why do you want to work on an open-source project this summer?**

I was a **GSoC student last year with Sugar Labs** and helped develop the Sugarizer Exerciser Activity.

As far as my open source contribution is concerned. I have contributed to a couple of open source repositories-

- I have opened a couple of issues in **Sugarizer** and a pull request for a new activity.

Issues: [Sugarizer Issues](#)

Pull Requests: [Sugarizer Pull Requests](#)

- I have made small contributions in other open source projects.

FOSSASIA open event android:

<https://github.com/fossasia/open-event-android/pull/1927>

MIFOS mifos-mobile:

<https://github.com/openMF/mifos-mobile/pull/539>

I also have a couple of open source repositories on Github which have an MIT Open Source Licence.

- **ChainList:**

A blockchain based decentralized marketplace for buyers and sellers. It is built using the ethereum platform.

<https://github.com/manki11/ChainList>

- **Messenger ChatBot:**

A express app that works as a backend to a messenger chatbot.

<https://github.com/manki11/MessengerChatBot>

- **Machine Learning Algorithms:**

A complete walkthrough of all the major machine learning algorithms in python.

<https://github.com/manki11/Machine-Learning-Algos>

## About The Project

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### What is the name of your project?

The name of my project is **Sugarizer Exercise Activity**.

### Describe your project in 10-20 sentences. What are you making? Who are you making it for, and why do they need it? What technologies (programming languages, etc.) will you be using?

Last year me and my mentor Lionel Laske, developed the first version of sugarizer exerciser activity. We implemented as many features as we could in the span of the summer. However, like all big projects all features could not be included. This year I plan to start from where i left of last summer.

### Aim of the project:

The aim of the project is to add the following functionality to the Exerciser activity.

1. Add functionality for teachers to **integrate pictures, audio and video** to all exercises in questions.
2. Build **3 more templates** for the activity
3. Build an interface for teachers to view all students **detailed results** and for students to view their detailed results
4. Integrate a way to **share exercises between different servers** (classrooms or different users)

The Activity would have the following templates added:

1. **Matching Pair:** A matching pair template will enable the teachers to have matching pair exercises. In this students will match a combination pair of pictures, audio and text.
2. **Group Assignment:** A group assignment template will enable the educators to have group assignment. In this students will add assignments into different categories.
3. **Free Text Input:** A free text input will enable educators to enter an image or audio with related text. The student will be shown the picture or the audio and he will have to fill in text.

The project will use the **Journal for storage** of user input and **images, audio, video's** and **Presence for server deployment of activity**.

## Future Deliverables:

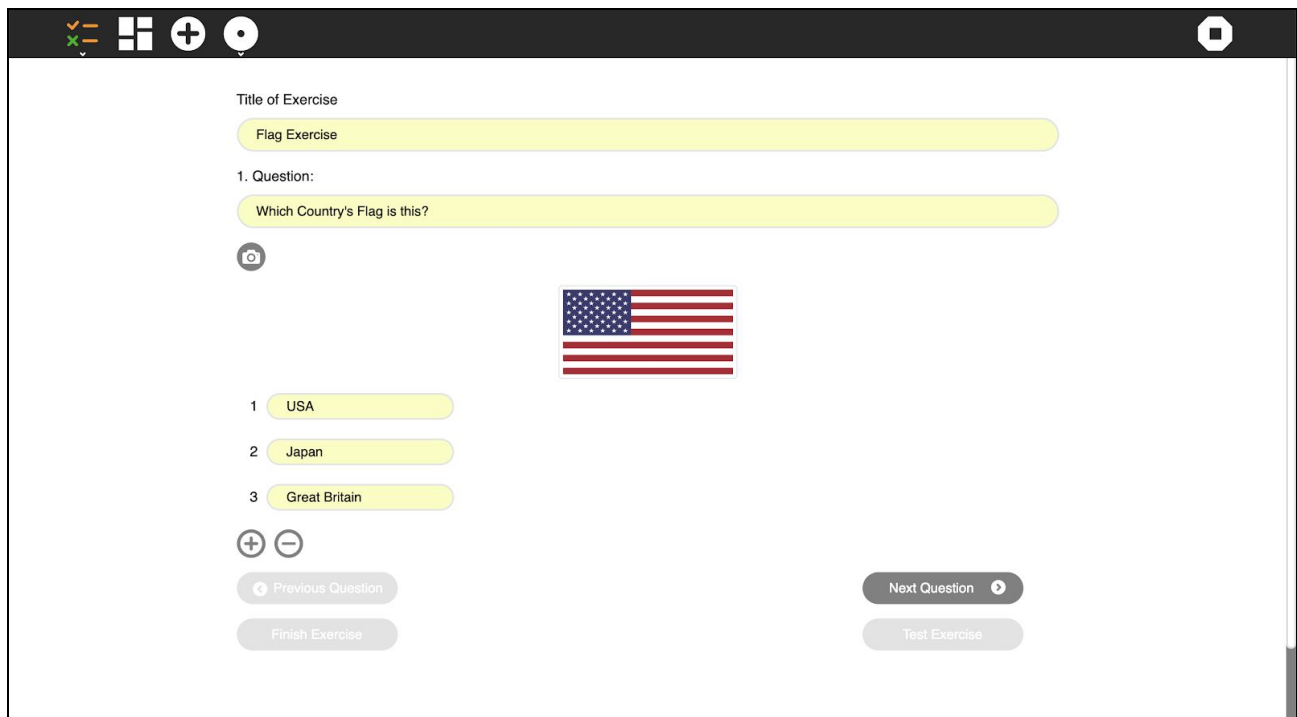
Features that can be added if time is left, or after GSOC is completed:

- **Documentation:** I will try to add as much documentation during the summer and continue to add them afterwards.
- **More templates:** I would like to work ahead and add more templates, making Exerciser activity a viable solution for teachers with different needs.

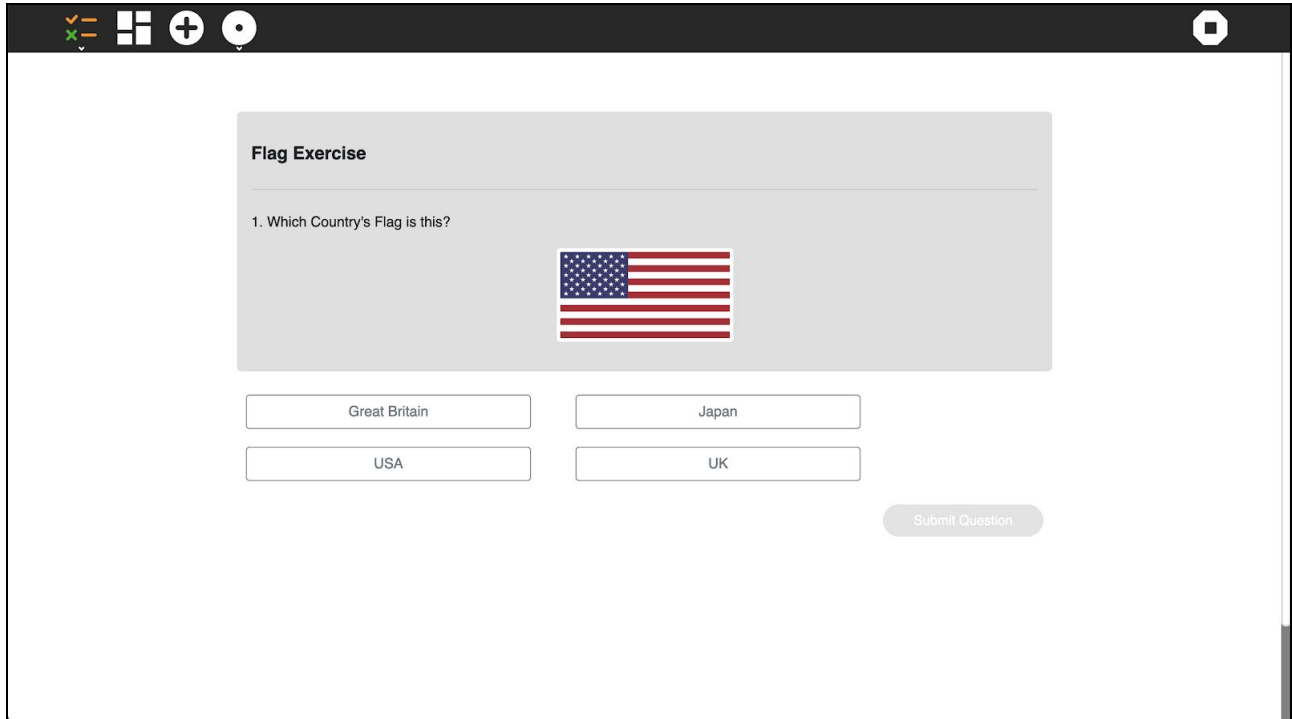
## Integrating Images, Audio etc in Exerciser

Sigarizer 1.1 has made it very easy to add images and audio into the journal. In Exerciser 1.1 we will extend this capability to Exerciser too. **I have already implemented adding Images in MCQ Template. It will be very simple to extrapolate that to other templates.** The implementation is on github.

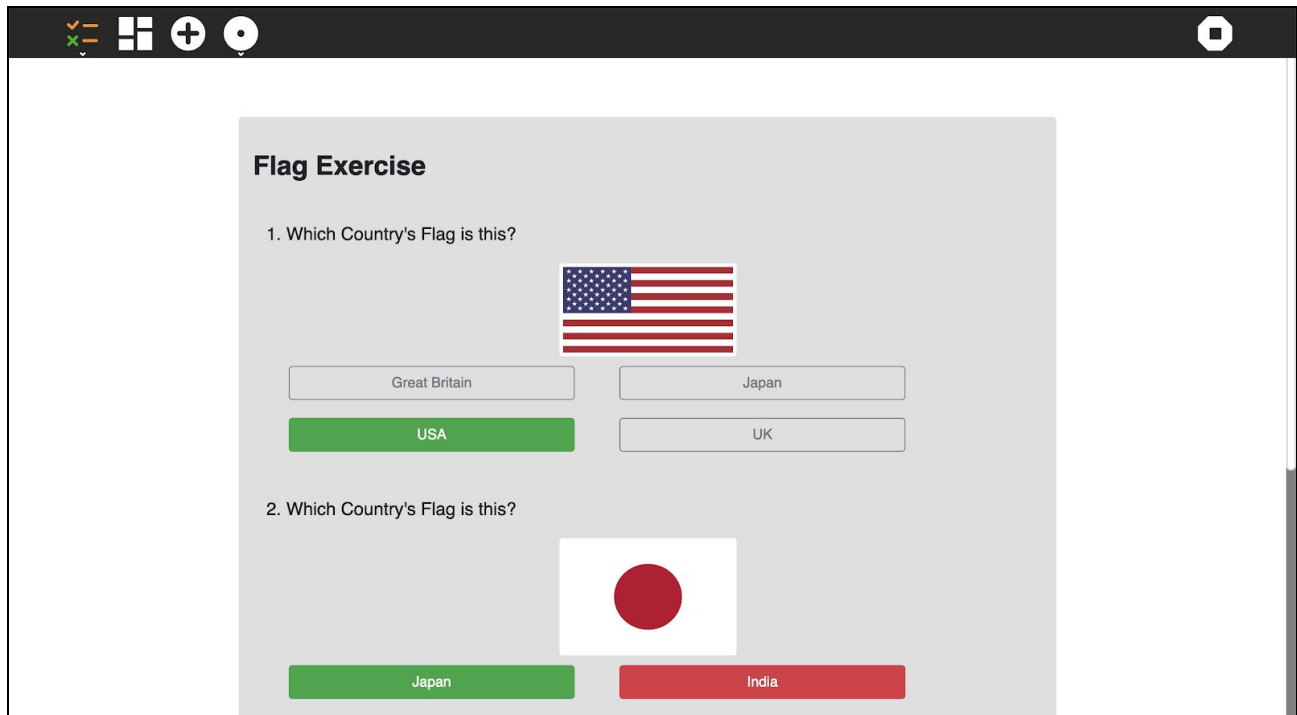
Here are the screenshots of integration of images in MCQ template.



**MCQ Builder**



MCQ Player

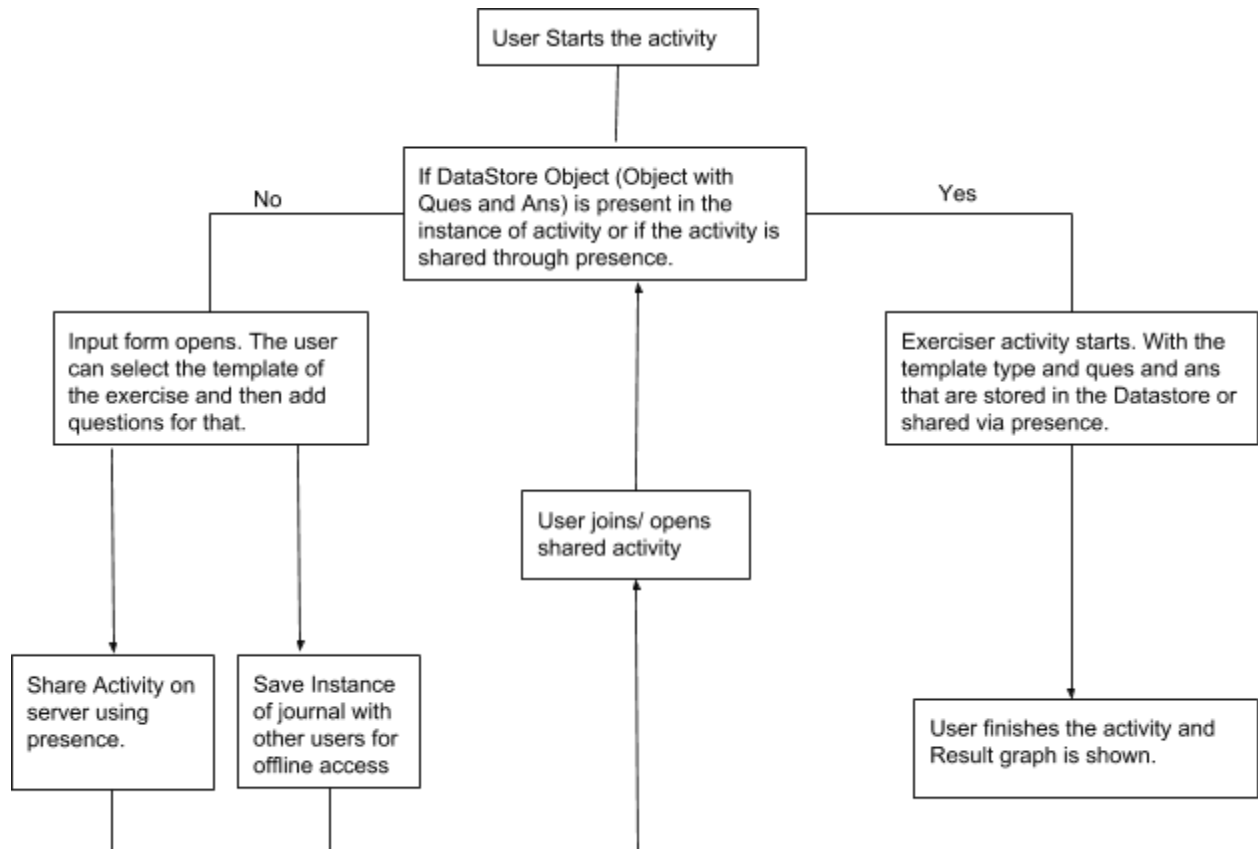


MCQ Results

## Adding Templates to Exerciser

### Implementation:

The user flow of the activity is given below (Same as last year):



### Explanation:

As the user opens a new instance of the Exercizer activity (being a new activity there will be no datastore object present in its instance). The user will be able to choose a template for the exercise.

After choosing the template, the user fills in the questions and its answers one by one. After adding a question and its answers the user will have the option to finish the exercise or add more questions.

After adding all the questions, the user will click on **Exercise completed**. The last question is stored on the datastore. After this point the user can share the activity (the activity cannot be shared unless the exercise questions are more than 1 and the user clicks on Exercise completed).

#### **For Shared Activities:**

Once the user shares the exercise, The questions object array is sent from the host to every new user using **Presence**. Once the new user gets the questions array, the exercise will automatically start.

#### **For Local Activities without Network:**

Once the user builds the exercise, the questions and answers array is stored in the datastore. If the instance of the activity is copied locally through the journal. Then, when a user opens the activity the datastore object will contain the questions array and hence the exercise will start.

#### **For Images and Audio:**

The images and audio are returned by the journal chooser in base64 encoded. The base64 string is saved with the question object. In this way the exercise can be shared with the images.

#### **Data Store Object:**

```
{
  template: "template_name",    // MCQ OR CLOZE OR LIST
  host: "host_name",
  questions: [
    {}, // question object will depend on template
    {},
    ...
  ]
}
```

## Templates:

### Matching Pair:

For the matching template, the user will have to enter a pair . Each pair will have 2 options. The user can choose between Image/Audio/Text for each.

```
{
  One: {
    Type:"text",           // type set to text
    Content:"Sun"         // text
  },
  Two: {
    Type:"Image",         // type set to image
    Content:"ahdbmwbk...." // base64 encoded image of sun
  }
}
```

In each question object their will be 2 objects. One and Two. Both can be either text, audio or image. They will be saved as a pair and randomized for the student.

### Group Assignment:

For the cloze test template, the user will have to enter different groups. For each group the user can have multiple answers.

```
{
  name:"Integers",
  Answers:[
    "1", "-6", "-10"
  ]
},
{
  name:"Fractions",
  Answers:[
    "1/6", "-2/3", "9/10"
  ]
}
```



Each object represents a group. In the first group we have Integers with corresponding answers etc. These groups will be shown in background and the student will have to drag and drop the answers in the respective groups.

### **Free Text Input Template:**

In this template text input will be added by the student for a corresponding Image/Audio etc.

```
{
  type:"Image"           // type of content (Image or Audio)
  Content: "anvsasasd..." // base64 image of sun
  Answer:"Sun"           // Answer to the above image/ audio
}
```

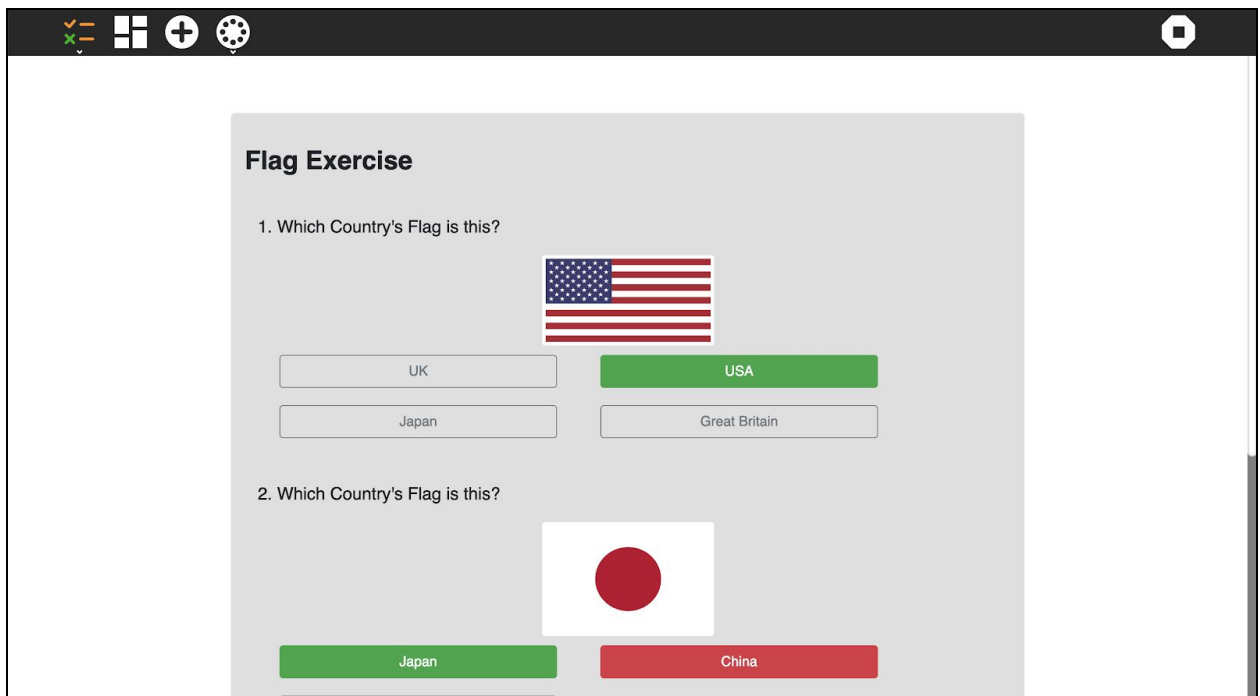
In this each object represents a question. In which an image or audio will be given and student has to fill the blank.

### **Detailed Scores for Teachers and Students**

For this feature i propose a Detailed Results screen for each template. The student will have the option after completing his exercise in the results screen to see his detailed results along with the correct answers. If the exercise has been shared, the teacher will see a list of all students who have attempted the exercise, and can see their detailed scores individually. I have already implemented this feature as part of the MCQ.



**Presence View for Teacher**



**MCQ Results for detailed results of MCQ template**

## Sharing of Exercises between Teachers on different networks

For sharing of exercises between teachers i propose 2 methods.

1. **Import/Export Method:** In this method a teacher who wants to share his/her exercise will click the export button. The json object of the exercise will be copied to his/her clipboard. The teacher can then share the exercise through email, blog etc. The teacher that wants to import the exercise will click on the import button. He/She will copy that json object in a text field. The exercise will be imported.
2. **Hosted JSON:** The teacher can also host his JSON object on a web page. He can enter the URL of the json object. The json object will be retrieved and converted into an exercise.

### **Dependencies:**

The following open source libraries will be used by the project:

1. **Bootstrap:** Library to help build responsive design. The UI will be capable to running on desktops to phones. <https://getbootstrap.com>
2. **Interact Js:** Library will be used for dragging and dropping(to be used in reordering of list). <http://interactjs.io>
3. **D3 Js:** Library will be used to show results using a wide variety of graphs so that the student can visualize his results. <https://d3js.org>
4. **React Drag and Drop:** This will be used to implement drag and drop functionality in the templates. [React DnD](#)

### **Key Features:**

Key features of the Activity will include:

1. **Localization:** The activity will support multiple languages from across the world.
2. **Responsive:** The activity will run on devices of multiple sizes.
3. **Integration with Journal:** The activity will be able to save its state locally in the journal and will also access images and sounds from there.
4. **Live Results:** When the activity will be shared via presence, the students can get a live performance review based on their performance relative to their peers.
5. **Integration of Images, Audio through Journal Chooser:** The activity will support importing of images and audio through the journal chooser.

**What is the timeline for development of your project? The Summer of Code work period is from mid-May to mid-August; tell us what you will be working on each week. (As the summer goes on, you and your mentor will adjust your schedule, but it's good to have a plan at the beginning so you have an idea of where you're headed.) Note that you should probably plan to have something "working and 90% done" by the midterm evaluation (end of June); the last steps always take longer than you think, and we will consider canceling projects which are not mostly working by then.**

This is the timeline i plan to follow:

<b>Days</b>	<b>Tasks</b>
May 6, 2019 - May 27, 2019.	<b>Community Bonding Period:</b> Communicate with my mentors and other org members to finalize the features in the Activity.
May 28, 2019 - June 11, 2019	<b>Implement journal chooser in previous templates and Build detailed results for previous templates.</b>
June 11 - 21, 2019	<b>Implement Group Assignment Template</b>
June 22, 2019 - June 26, 2019	<b>Phase 1 Evaluation</b>
June 27, 2019 - July 12, 2019	<b>Implement Match the Pair Template</b>
July 13 - 22, 2019	<b>Implement Free text Input Template</b>
July 22, 2019 - July 26, 2019	<b>Phase 2 Evaluation.</b>
July 26, 2019 - August 19, 2019	<b>Develop methods to share exercises, including export import method and JSON method. Test activity and write some documentation</b>
August 19 - 26, 2019	<b>Final Evaluation</b>

**Convince us, in 5-15 sentences, that you will be able to successfully complete your project in the timeline you have described. This is usually where people describe their past experiences, credentials, prior projects, schoolwork, and that sort of thing, but be creative. Link to prior work or other resources as relevant.**

I have build the exerciser from scratch as part of GSoC 2018. I am familiar with the complete code base, sugar UI and all sugarizer features. I have already integrated the use of images in MCQ template. I have built 3 templates last year with full functionality of sugar API. I have also implemented detailed score screen for teachers and students in MCQ Results. In all, I have experience building most of the features required to be added in the exerciser activity.

Moreover, i have worked on multiple projects on different platforms. I have also reported multiple bugs in sugarizer, along with building an activity from scratch. Over the past year, I have worked on similar apps that have required similar functionality:

1. YelpCamp: A Campsite review site, which includes Authentication, User Reviews along with Comments by other user.  
Link: <https://github.com/manki11/YelpCamp>
2. Messenger Chat Bot: A chatbot that works with facebook's messenger API, to automate responses on the facebook page.  
Link: <https://github.com/manki11/MessengerChatBot>
3. ChainList: An ethereum based Decentralized App for buying and selling goods.  
Link: <https://github.com/manki11/ChainList>

I have also had experience developing Android apps for the past 2 years. I have built two apps that are currently on the Play Store:

1. Othello: (Chinese board game) This is chinese board game that i developed which has over 3000 downloads.  
Link: <https://play.google.com/store/apps/details?id=com.zcorp.game.othello&hl=en>
2. Zaillet Media (A blogging Startup in Delhi): As part of my summer internship last summer, I built the complete Zaillet media Android App.  
Link: <https://play.google.com/store/apps/details?id=com.zaillet.zailletmedia&hl=en>

I have also **helped find bugs and built the Sprint Math activity for sugarizer.**

Issues: [https://github.com/llaske/sugarizer/issues/created\\_by/manki11](https://github.com/llaske/sugarizer/issues/created_by/manki11)

Pull Requests:

<https://github.com/llaske/sugarizer/pulls?utf8=%E2%9C%93&q=author%3Amanki11+>

## You and the community

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**If your project is successfully completed, what will its impact be on the Sugar Labs community? Give 3 answers, each 1-3 paragraphs in length. The last one should be yours. The other two should be answers from members of the Sugar Labs community, at least one of whom should be a Sugar Labs GSoC mentor. Provide email contact information for non-GSoC mentors.**

### **My Answer:**

Exerciser is a great Activity inside sugarizer for teachers and educators. However, as i have mentioned above, it lacks important features, like image and audio integration along with some important templates. By integrating the above proposal into Exerciser, it will become much more useful and more widely used by educators.

### **Lionel Llaske's Answer (GSoC Mentor):**

The Exerciser activity has been asked by teachers and new features had been asked by teachers too. The tool will allow to test knowledge of children in the class. As soon it will be release it will be used on the field on our current Sugarizer deployment in Saint-Ouen.

### **Michaël Ohayon Answer (GSoC Mentor):**

The Sugarizer Exerciser Activity is a real step forward for teachers. This activity intends to allow anyone to create and start exercise sessions through Sugarizer.

This is a feature that is requested by teachers on field and that will make life easier for everyone.

### **What will you do if you get stuck on your project and your mentor isn't around?**

In such situation , I will first try to solve the problem by searching on web for suitable solutions. If this doesn't work, then I will contact other developers on the IRC channel and also post on the mailing list. From my past experience, I have noticed that the members of community are quite responsive and I'm sure that they will be able to help me out. I'm also in contact people, my fellow college students who have development experience to help me out. I am also in contact with some developers in the Tech Industry from my past internships who would not hesitate in helping me out.

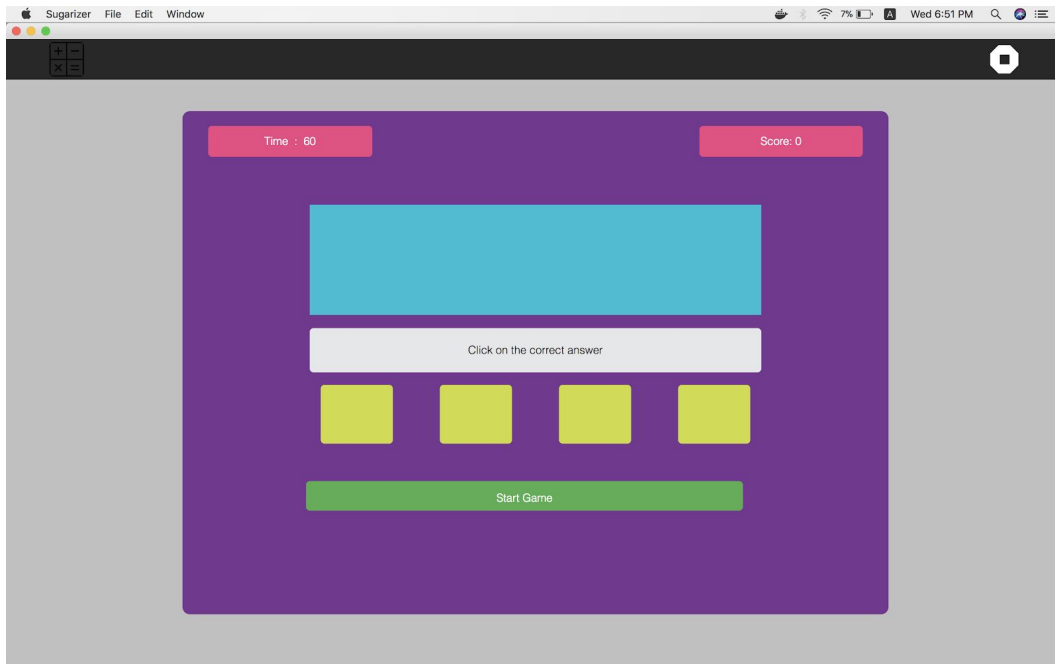
**How do you propose you will be keeping the community informed of your progress and any problems or questions you might have over the course of the project?**

I am planning on maintaining a blog regarding the project where I will post updates of the progress, obstacles being faced and their solutions. As far as weekly progress is concerned, I will make regular pull requests to sugarizer, so anyone in the org can view my progress. For problems or questions I will be using the IRC as i have been using during the proposal period and keep in touch with my mentors through email also.

## Miscellaneous

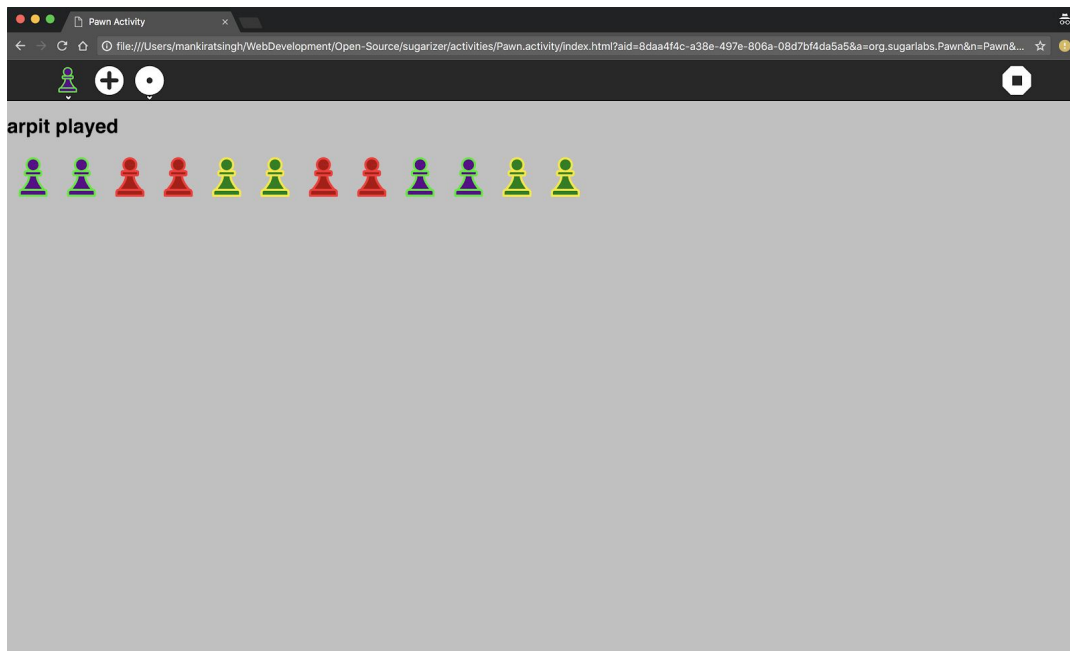
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Screenshot of your new activity executed in Sugarizer:



The pull request for the above activity: <https://github.com/llaske/sugarizer/pull/195>

I have also completed the complete sugarizer activity tutorial:



The complete code of the tutorial: <https://github.com/manki11/PawnActivity>



**Describe a great learning experience you had as a child.**

When I was in school, I used to actively participate in technology and science related competitions. Once, my teacher told me about an inter school game making competition 3 days before the final date of submission and even though it was quite late to start coding the game from scratch and finishing it, I still didn't give up and tried my best to make the game and successfully submitted it. Even though I didn't win that competition but the whole journey of making that game helped me unearth my passion for coding and taught me how to stay calm and focussed under stressful situations.