

# GSoC '19 Project Proposal

## Sugar Labs: Switch to python 3

### **Basic Details**

#### **Full Name**

My name is Aniket Mathur and I am 2<sup>nd</sup> year E.C.E undergraduate student at the **Indian Institute of Technology Roorkee**.

#### **Email and Github Username**

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**Username:** Aniket21mathur

#### **Your first language**

My first language is Hindi and I am proficient in speaking and understanding English.

#### **Location and Timezone**

**Location:** Paonta Sahib, Himachal Pradesh, India .

**Timezone:** UTC +5:30 India Time Zone

#### **Share links, if any, of your previous work on open source projects?**

In my freshman year, I got introduced to Github and web development. Since then I kept myself involved in developing and learning about software. I made it a practice to regularly push my work to Github, the contribution map full of green dots really fascinated me and it also helped me to get my code reviewed and improved from my colleagues.

I worked on some of my personal small scale projects for learning purposes, which can be found on my Github profile [Aniket21mathur](#) .

I have been working with Sugar Labs for the past three months and this is my first time contributing to such a big open source project. The last three months had been a great learning experience for me and this is some of my contributions to Sugar Labs:-

- <https://github.com/sugarlabs/sin-dientes-activity/pull/8>
- <https://github.com/sugarlabs/convert/pull/21>
- <https://github.com/sugarlabs/sin-dientes-activity/pull/13>
- <https://github.com/sugarlabs/myosa-examples/pull/2>
- <https://github.com/sugarlabs/musicblocks/pull/1679>
- <https://github.com/sugarlabs/fossrit/pull/5>
- <https://github.com/sugarlabs/collabedit/pull/6>
- <https://github.com/sugarlabs/across-and-down-activity/pull/12>
- <https://github.com/sugarlabs/convert/pull/20>
- <https://github.com/sugarlabs/maps-activity/pull/12>

## Your Motivation

### **What is your motivation to take part in Google Summer of Code?**

Being a software enthusiast from my first year I always loved to think and develop ideas of my own. My interest in web development introduced me to git and Github which, for me, ultimately paved a path towards open-source. Making web pages and databases, developing games and then pushing those to Github to increase the count of my repositories and commits always fascinated me.

When I was in the first year I heard about Google Summer of Code from my seniors as many of them were contributing to different organisations. They shared their experience that how good it feels when you get your first **pull request** merged in a big organisation and that your work directly affects the open source community and a large number of people using that software. This acted like a kick-start for me to research more about open source and Google Summer of Code.

On my personal, note I think that Google Summer of Code is the best way to learn how to work in an open source community where you have a number of people from different parts of the world working and building code collaboratively. The three-month duration of GSoC will also allow me to apply my current skills as well as acquire a new set of them under the guidance of quality mentoring organisations and best mentors. The remote working policy of GSoC makes it

the best program a college student can get involved in during their summer holidays for a great learning experience.

## **Why did you choose Sugar Labs?**

### **Codebase:**

Among all the programming languages I am quite comfortable with **javascript** and **python**. So I decided to search for organisations having their code bases in these languages from GSoC '18 organisation list and luckily found Sugar Labs as one of those. So I started contributing to Sugar Labs from December itself. The code base of Sugar Labs was well organised and isotropic. The activities that we work on follow a similar fundamental code structure, adding further complexity depending on the use case of the activity. This helped me a lot understanding and getting acquainted with the code base of Sugar Labs.

### **Great mentors:**

We also have great mentors here at Sugar Labs, who are always willing to help to the greatest extent that they can. Being a noob to open source I received great help from **@walterbender** and **@quozi** in starting contributing to the organisation. During the entire time since I am contributing, I kept asking a lot of doubts and was full of queries and the next day my inbox was full of emails from Github about mentors answering my doubts and clearing my queries especially **@quozi**. The quick responses from mentors kept me motivated and enthusiastic.

### **Learning software for children:**

Also, the purpose of Sugar Labs is to provide Education to the children, which also acts as a driving force for me to work. It really makes you feel at the peak when you know that your work is going to contribute to the social cause and will impact society in a positive manner. Sugar Labs provides the perfect opportunity for developers to do social good following their passion.

### **Opinion's matter:**

At Sugar Labs we discuss and develop as a team, everyone's opinion is given equal weightage irrespective of whether you are a first-time contributor or a member of the organisation. Our ultimate motive is to build the best we can!

For these reasons, I choose Sugar Labs as the only mentoring organisation for Google Summer of Code 2019.

## Why do you want to work on this particular project?

### Python:

The goal of the project is to **port sugar and core activities to python 3**. This project entirely involves working with python and it's various libraries and engines and a majority of my contributions in Sugar Labs are to core Sugar activities coded in python, which made me quite comfortable with the source code and working with python.

### Learning opportunities:

This project also has lots of learning opportunities for me, it will help me to enhance my knowledge of **python** language, allow me to work with and learn more about the **telepathy glib** library and the **gwebsocket** library. Also, this project will provide me greater exposure to Sugar and its functioning.

### High priority:

One more reason for me to work on this project is the importance of this project for the organisation. With the release of **sugar-toolkit-gtk3 (v 0.113)** which is compatible with python 2 and python 3, it's really necessary for Sugar Labs to make it's code base congruent with python 3 as soon as possible and make a release. Being a member of the Sugar Labs organisation I should take it as a responsibility to complete this project and better do it as a GSoC '19 project to make it more structured and planned.

## What are your expectations from us during and after the successful completion of the program?

During the program what I expect from Sugar Labs is to continue providing me guidance and support just like the mentors at Sugar Labs are providing me till now. Being my first big open source project it might be possible that I do things the wrong way or make mistakes, so I expect my mentors to correct me. My expectations are to complete this project successfully with cooperation and collaboration.

After the program, I am willing to further contribute to Sugar Labs to other projects and tasks. I am also willing to mentor other programs for Sugar Labs in the future. So what I expect is support and collaboration from the community.

# Project Details

## What are you making?

The aim of this project is to **port sugar and core activities to python 3**. In this project, I would be making Sugar, Sugar toolkit and other Sugar activities compatible with python 3. The work on this project was started in GSoC '18 and needs to be completed soon.

### Following is the project task checklist in chronological order:

- **Port all Telepathy bindings to TelepathyGLib.**

The telepathy-glib library is a GObject-based C binding for the Telepathy D-Bus API. It may be used by client applications. It is also used by connection managers. The telepathy library does not have its bindings for Python 3, and porting telepathy to its PyGObject binding is a prerequisite for this project.

For example, after port

```
import telepathy
self.tubes_chan[telepathy.CHANNEL_TYPE_TUBES].OfferDBusTube(SERVICE, {})
```

Will change to

```
from gi.repository import TelepathyGLib
self.tubes_chan[TelepathyGLib.IFACE_CHANNEL_TYPE_TUBES].OfferDBusTube(SERVICE, {})
```

The current status of this task is [Port to TelepathyGLib](#).

- **Make activity-chooser window modal and remove its dependency from toolkit to jarabe.**

### Following is the task checklist:

- ActivityChooser needs to be made modal.
- PopWindow needs to be moved from sugar-toolkit-gtk3 to sugar, in order to remove the dependency of toolkit on jarabe.

Work can be started by taking [this](#) as a base.

- **Release gwebsockets for Python 3.**

It is a web socket server written in python. It uses GIO (GIO provides a modern and easy-to-use VFS API. It provides a file system abstraction which allows applications to access local and remote files with a single consistent API.) for network communication and hence it easily integrates with the GLib (GLib provides the core application building blocks for libraries and applications written in C. It provides the core object system used in GNOME, the main loop implementation, and a large set of utility functions for strings and common data structures.) main loop. As a part of this project, it is important for Sugar Labs to release a Python 3 version of these web sockets. The web sockets are made compatible with python 3 and requires a release as soon as possible.

**Checklist for work to be done for a release( v0.5 ):**

- Test using latest autobahn version.
- Release to pypi.python.org.
- Report bugs to **Debian** and **Fedora** advising of new upstream release.

- **Porting sugar-toolkit-gtk3 to six and making a release compatible with both Python 2 and 3.**

Sugar v0.113 unstable is recently released, this version provides Python 3 bindings. Yet the version has some issues/bugs and not fully compatible with both 2 & 3.

The sugar-toolkit-gtk3 is ported using six, a python library providing utility functions for smoothing over the differences between the Python versions with the goal of writing Python code that is compatible with both Python versions.

For example-

<code>import StringIO</code>	<code>import SocketServer</code>
<code>preview_str = StringIO.StringIO()</code>	<code>SocketServer.TCPServer.server_bind(self)</code>

Change to

<code>import six</code>	<code>from six.moves import socketserver</code>
<code>preview_str = six.BytesIO()</code>	<code>socketserver.TCPServer.server_bind(self)</code>

There is still a considerable amount of work needed to be done and a stable version of Sugar is needed to be released soon.

Link to previous work, [here](#).

Work remaining to be done, [list](#).

- **Port Sugar Desktop to Python 3**

Porting Sugar Desktop is next in chronology. The port was started in GSoC 18 and need to be completed.

Partial work is done [here](#).

- **Port all fructose activities to python 3.**

Almost all of the fructose activities were ported to Python 3 in GSoC '18 with code in separate branches named "python3" as sugar-toolkit-gtk3 with python support was not landed till then. Now what remains after packaging of Sugar v0.113 by Ubuntu or Fedora is testing ported patches again, fixing flake8/PEP8 errors and warnings, if any, making changes to master and releasing the activities.

## **How will it impact Sugar Labs?**

The support for Python 2 will be dropped in the coming years and thus it is important to switch to python 3. There is a need to port all the activities used by children and teachers to python 3, to ensure the smooth functioning of these activities in the future. These activities have dependencies on sugar-toolkit and some of them use telepath library. This project involves porting the toolkit and switching to TelepathyGLib, which are prerequisites for porting any sugar activity to python 3.

After completion of this project, it will be easier for the new developers to work around other activities and port them to python 3, as python 3 compatible toolkit and other dependencies will be available to them. Porting activities to python 3 will also bring uniformity and consistency in the code base of the Sugar Labs organisation. Considering future prospects it is necessary to have a code base easier to understand and contribute, to let new contributors comfortably come in. A perfect switch to Python 3 is a necessity for that to avoid confusion and conflicting histories.

This project is a base project for all other python based projects of the organisation. The smooth functioning of python 3 compatible toolkits and sugar desktop is really necessary for other

activities to work. And hence completion of this project will provide a pathway for other future projects to work on.

## What technologies (programming languages, etc.) will you be using ?

The Major part of the project will involve coding in **Python** and use of **telepathy-glib** and **six** libraries. Possible changes in the documentation for port to python 3 will involve the use of **Latex** as well.

Porting will also involve the use of **2to3** python port tool.

## Timeline

27 May, 2019 to 31 May, 2019	<ul style="list-style-type: none"><li>• Go through telepathy and TelepathyGlib documentations.</li><li>• Also go through the merged and in-progress port pr's to have a better understanding and discuss doubts related to it with mentors.</li></ul>
1 June, 2019 to 10 June, 2019	<ul style="list-style-type: none"><li>• Port remaining activities and toolkit to TelepathyGlib.</li><li>• Improve Telepathy project documentation.</li></ul>
11 June, 2019 to 13 June, 2019	Go through previous work on making activity-chooser window modal and decide how to proceed further.
14 June, 2019 to 22 June, 2019	Work on making activity chooser window modal and removing it's dependency from toolkit to jarabe.
23 June, 2019 to 25 June, 2019	Work on releasing gwebsockets for python 3.



<b>25 June, 2019 to 28 June</b>	<b>Discussing changes with mentors before phase one evaluation .</b>
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## **Phase one evaluation**

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<b>29 June, 2019 to 3 July, 2019</b>	<ul style="list-style-type: none"> <li>• Go through official documentation of six .</li> <li>• Go through previous work done on porting sugar-toolkit-gtk3 to six .</li> </ul>
<b>4 July, 2019 to 11 July, 2019</b>	<b>Complete the port work remaining for the toolkit .</b>
<b>12 July, 2019 to 14 July, 2019</b>	<b>Go through the previous work done in porting Sugar-desktop to python 3.</b>
<b>15 July, 2019 to 22 July, 2019</b>	<b>Complete the port work remaining for the Sugar-desktop .</b>
<b>23 July, 2019 to 26 July, 2019</b>	<b>Discussing changes with mentors before phase two evaluation .</b>

## **Phase two evaluation**

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<b>27 July, 2019 to 4 Aug, 2019</b>	<b>Port Remaining fructose activities to python 3.</b>
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<b>5 Aug, 2019 to 12 Aug, 2019</b>	<b>Review and test already ported activities. Fix bugs, errors and warnings. Release activities.</b>
<b>13 Aug, 2019 to 19 Aug, 2019</b>	<b>Review the entire work done during summers and make necessary documentation .</b>
<b>19 Aug, 2019 to 26 Aug, 2019</b>	<b>Make final submission and discussing future aspects with mentors and the community.</b>

My summer vacations are starting from 1 May to 15 July, in that period I can give about 45-50 hours per week and after the college starts I will be able to manage 35-40 hours a week. I have no other commitments for the summer vacations, so I can devote most of my time to GSoC.

I am planning to continue working on the project after the program ends. I am also thinking of mentoring other open-source programs for Sugar Labs in the future.

#### **Deliverables:**

- Sugar toolkit and sugar desktop made compatible with python 3 .
- Sugar fructose activities ported to python 3 and latest version of these activities released.

## **Sugar Labs' motivation**

**Convince us that you will be a good fit for this project, by sharing links to your contribution to Sugar Labs.**

I am an active contributor to Sugar Labs for the last three months and now I am quite comfortable working with the code base of SugaLabs. Now I am familiar with Sugar-desktop and I know how it works, which would help me in porting the code base. In recent days, I also learned about six and telepathy as well as read articles about how different python 2 and python 3 are. Now I feel quite comfortable working with both versions.

I am coding in python for the last 1.5 years, I have done a lot of small projects in python which can be found on my Github profile- [Aniket21mathur](#) .

Following are some of my other major involvements:

## **Moodcafe**

- ❑ One month long internship. Worked on the backend of their mobile app, coded in Nodejs with MongoDB database.
- ❑ Added some new features like group chat and improved existing algorithms.

## **Alumni Website**

- ❑ Being a part of the Institute Alumni Relations Cell (IARC) of IIT Roorkee, I contributed to the new official alumni website of the campus, coded using the Django framework of python.

## **These are my pr's for port to python 3 -**

- <https://github.com/sugarlabs/Pippy/pull/63>
- <https://github.com/sugarlabs/across-and-down-activity/pull/17>
- <https://github.com/sugarlabs/sin-dientes-activity/pull/16>

Also for all the time I am contributing to Sugar Labs I have over 40 pull requests made and about 45 commits in the code base of Sugar Labs.

[Link to all my commits.](#)