

Reconciling rhythm with pitch in Music Blocks widgets

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Your Motivation

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

I am intrigued by the open source community and feel that it plays an integral role in today's market as it gives a strong competition to huge companies and promotes innovation. Through networking, it helps small independent developers to bond and build a community. In my opinion, the esteemed Google Summer of Code is a great initiative by google to aid the open source community and provide a platform for budding developers to get involved in the community and contribute. Through GSoC, organisations give opportunities to open source newbies and students pursuing undergraduate like myself to implement our proposed ideas and key features in the project. This is a huge perk for me as I get to make an impact in the open source world at such an early stage of my career. Also, the prestigious "GSoc" tag and certificate cannot be overlooked.

Why did you choose Sugar Labs ?

Sugar Labs is one such organization where all the projects are focused towards assisting people from different age groups learn through creative and interactive means. Apart from this, I was also fascinated by their professional codebase and felt that I could learn a lot from this organization by contributing to it. I found that the people here are very supportive and always eager to help when someone is stuck somewhere.

Why do you want to work on this particular project ?

I liked the idea of Turtle Blocks from where I stumbled upon Music Blocks. After running their Music Blocks website I was eager to learn how it worked and hence I committed to exploring their codebase. Eventually, I resolved a few issues and developed a keen interest in this project which kept me going.

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

All I expect from your organization is the same level of support and cooperation which I got till now and to have improved my programming, communication and project management skills during and after the successful completion of the program.

Project Details

What are you making ?

- The main goal of this project is to reexamine the assumptions underlying the segregation of rhythm from pitch in these widgets and to design and implement a more unified experience.
- This can be done by improving the already present widgets inside music blocks as it will not cause any changes in the usage of any other section of music blocks and will not confuse the existing users .
- Currently in music blocks a user has to generate a rhythm by using rhythm maker widget and then import it inside another widget like phrase maker.
- I would like to streamline this process by including the functionality of editing rhythms inside phrase maker and in the case of musical keyboard the user can not even import rhythms so I will also like to implement the functionality of importing rhythms inside musical keyboard and edit it inside widget itself.

How will it impact Sugar Labs ?

Sugar Labs is an open source organization and Music Blocks is used and loved by many users. Widgets are a important part of music blocks and by improving the usability and quality of widgets we can improve the user experience.

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

I will be using HTML, CSS and Javascript to implement the features.

Implementation Details

Presently, user cannot edit rhythm in phrase maker and cannot input rhythms in musical keyboard. If a user wants to use phrase maker with a particular rhythm he/she can do it either by manually adding rhythm blocks to Phrase Maker widget or by creating a rhythm from rhythm maker widget and adding it to phrase maker so I would like to propose a few new set of functions which will allow a user to edit rhythms inside the widget itself. And for musical keyboard I would like to propose that we capture the duration for which a user presses a note. Also user should be able to play musical keyboard with the help of a keyboard.

Phrase Maker Implementation

Presently Phrase Maker looks like as shown in the Figure(1).

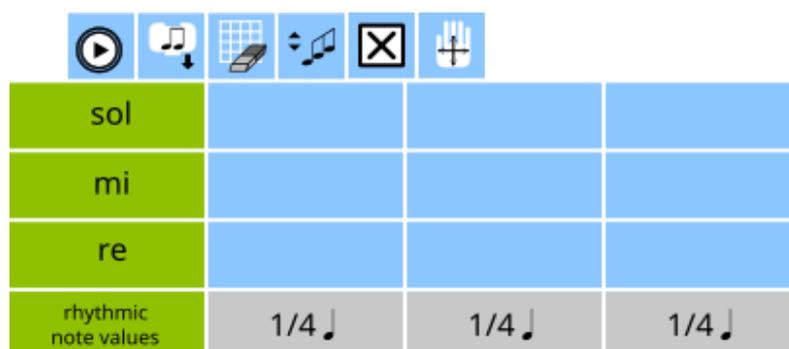


Figure 1

As per the proposal if a user clicks on note value it will open a pie menu as shown in (Figure 2).

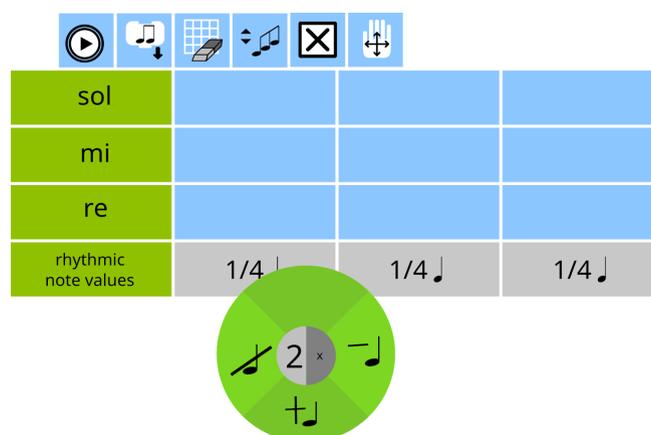


Figure 2

After clicking on note value a menu will open

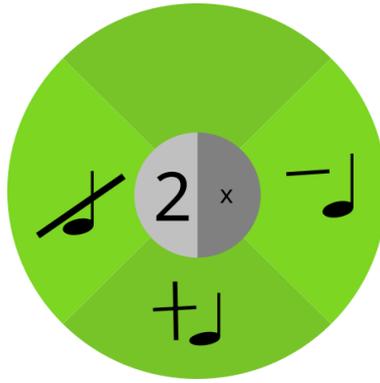


Figure 3

New Buttons-



Figure 4



Figure 5



Figure 6



Figure 7

When the user clicks on the divide note value mode button(Figure 4) it will divide the note into equal parts. The number of divisions will depend upon the value shown in Figure 7. A buttons to add and delete notes will also be shown (Figure 5&6 respectively).

- **Divide note feature**

After clicking on a note value widget will look as shown in the Figure 8..

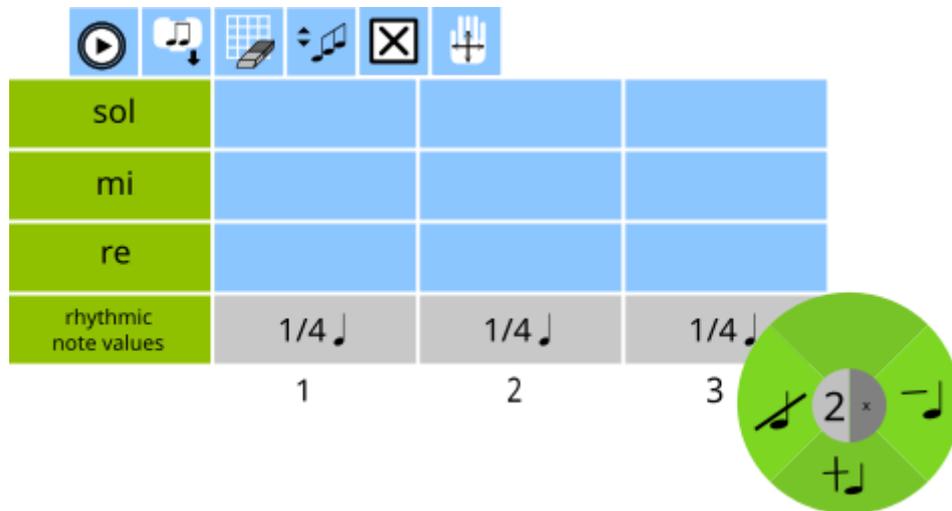


Figure 8



Figure 9

If the user will click on second and third column(Figure 9) of note value the notes will be divided into two(as the number of divisions is specified as 2) and the widget will look something like Figure 10.

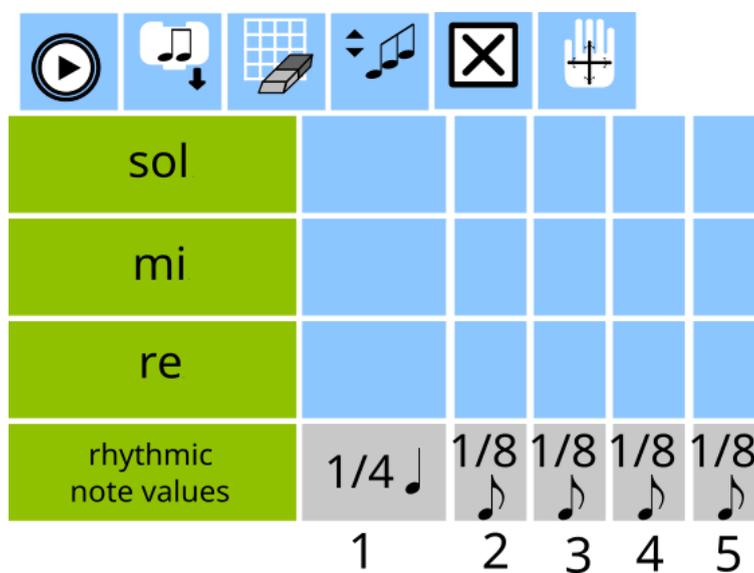


Figure 10

- **Combine note feature**

Now if the user wants to merge third and the fourth notes he/she should keep the mouse down on third note and drag mouse to fourth note and release the mouse, this will merge the third and fourth note together as shown in Figure 11

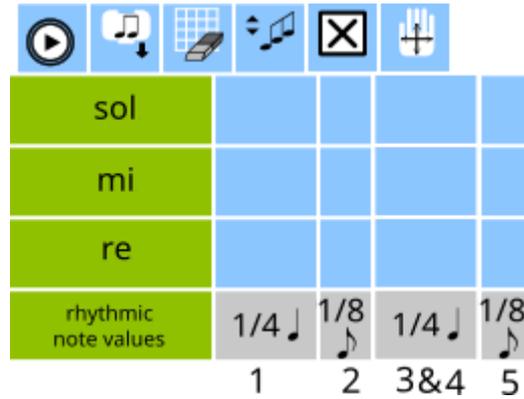


Figure 11

If the user wants to combine multiple notes he/she can do the same by dragging the mouse onto multiple notes.

- **Add note feature**

If a user wants to add a note to the rhythms it can be done by clicking the add note button(Figure 12) which will add a 1/1 note to the end as shown in Figure 13

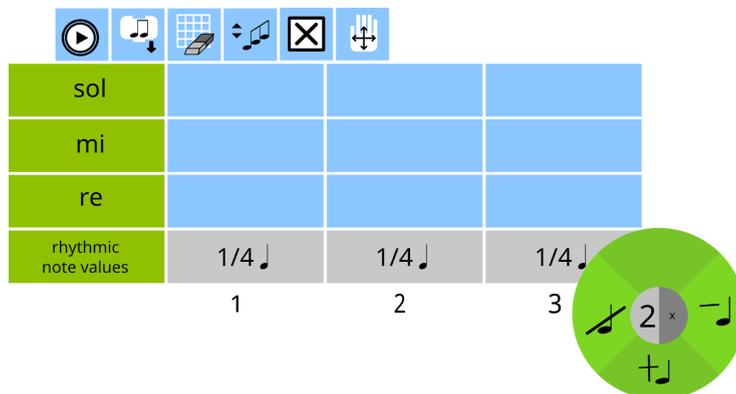


Figure 12



Figure 13

As you can see that note(4) will be added

- **Delete note feature**

If a user wants to delete a particular say note 2, it can be done by clicking on the delete note button (Figure 14) and it will delete the respective note(Figure 15).

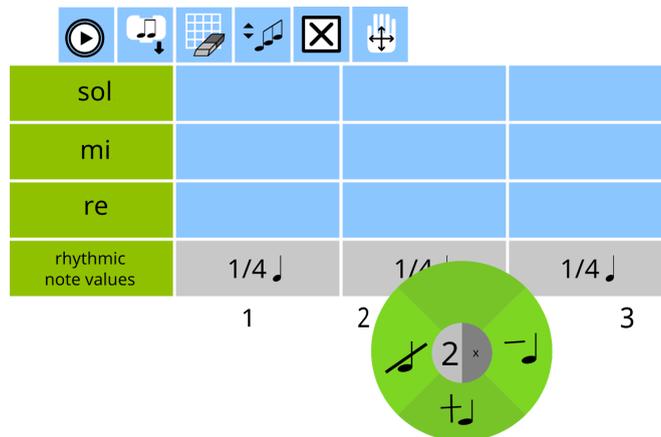


Figure 14

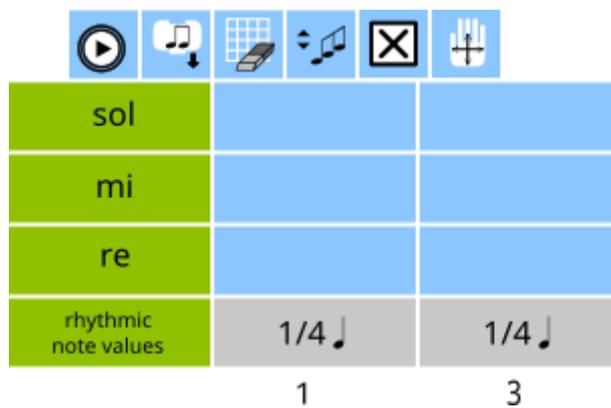


Figure 15

Now whenever the user divides or merge a note the changes will be reflected on Phrase Maker block the values inside the rhythm blocks will be edited and new rhythm blocks will be added where necessary. The initial block would have looked like Figure 16

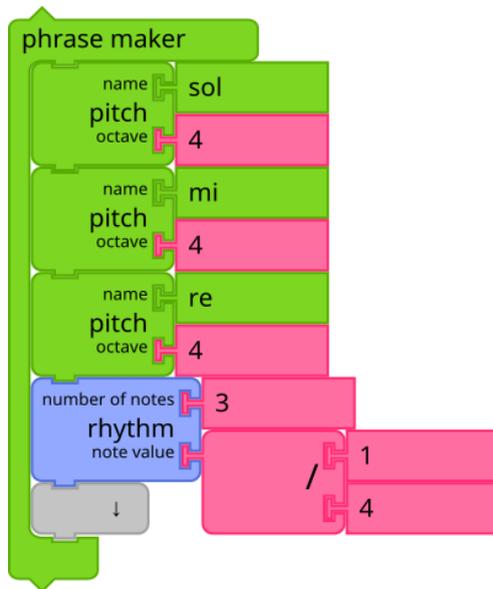


Figure 16

After dividing the second and third note the block would look like Figure 17

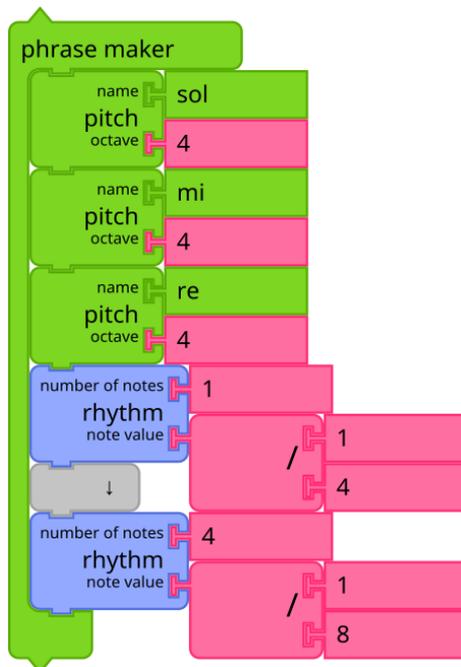


Figure 17

And after merging the third and fourth notes the block would look like Figure 18

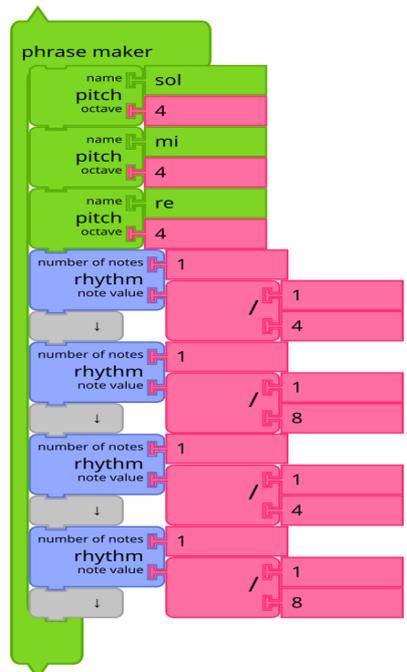


Figure 18

• **Simple Triplet Case**

In case of simple triplet two things can happen. Either the user can click on triplet note value or rhythmic note value.

In case of triplet note value triplet will be divide as shown in Figures 19 & 20.

sol		
mi		
re		
triplet note values	1/4 ♪	
triplet value	1	
rhythmic note values	1/4 ♪	

Figure 19

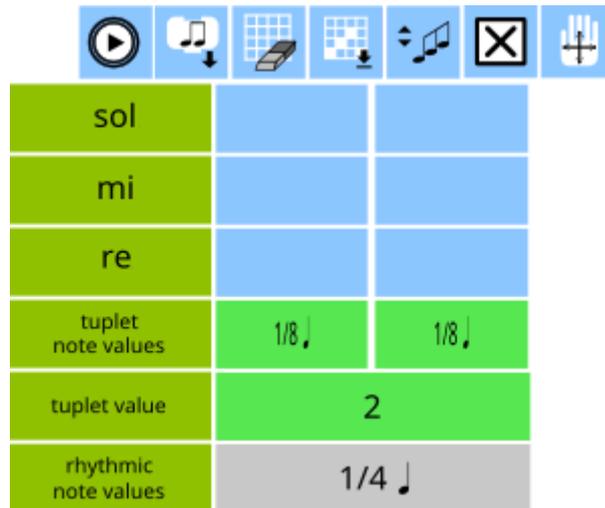


Figure 20

In case of rhythmic note value it will be divided as shown in Figures 21 & 22.

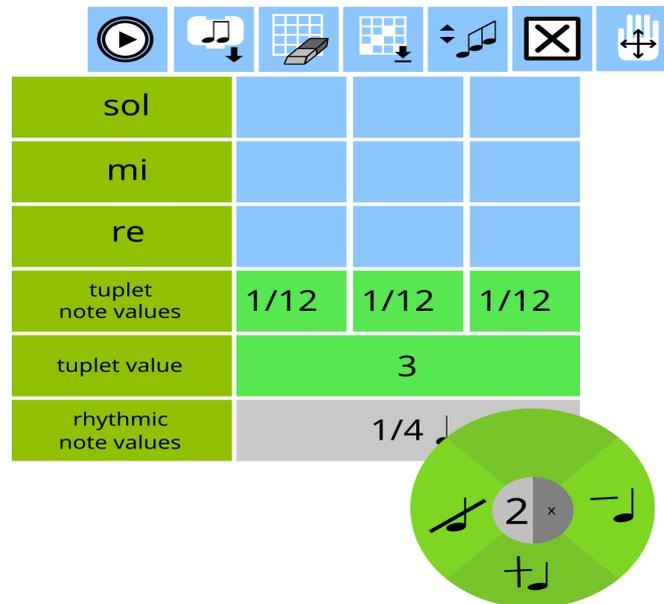


Figure 21



Figure 22

- **Imported Rhythms Case**

As in the case of rhythm imported from rhythm maker it will be similar to simple tuplet example as rhythm maker generates rhythms by creating a action consisting of simple triplets.

- **Tuplet note case**

In case of tuplet note the following will happen as shown in Figure 23 & 24 when we divide note into two.

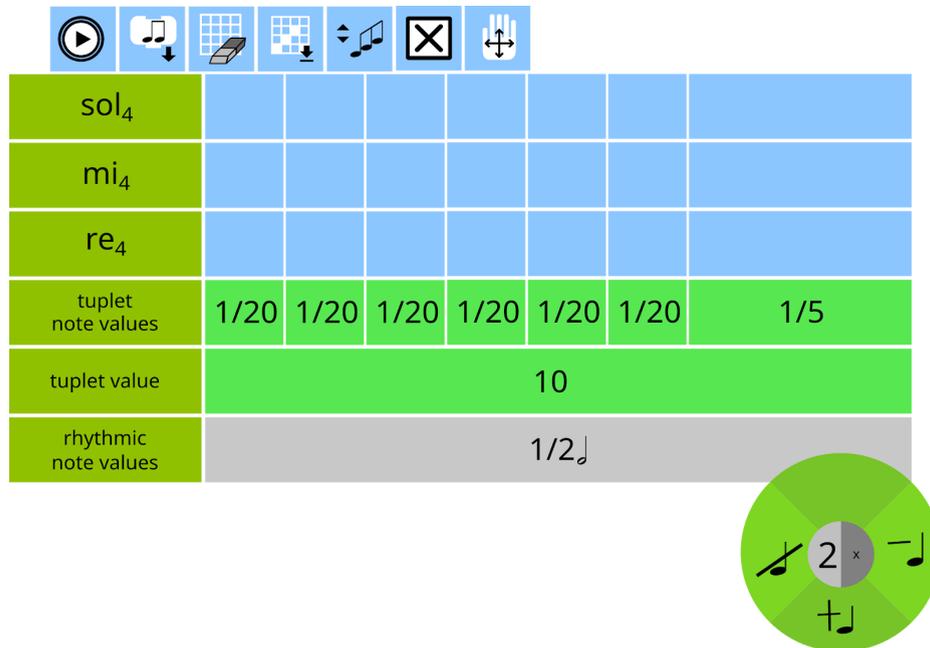


Figure 23

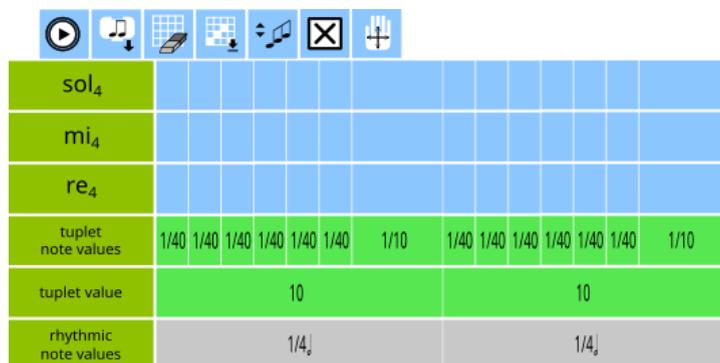


Figure 24

Musical Keyboard Implementation

Presently musical keyboard looks like Figure 25

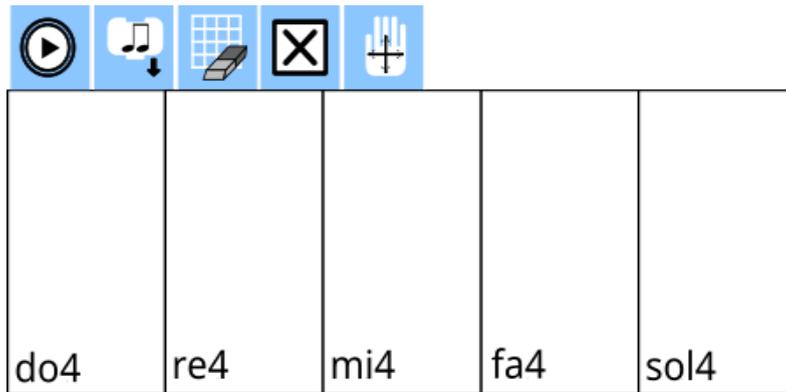


Figure 25

I propose to add a new feature, play musical keyboard with the help of keyboard. This can be done by adding a new button(Figure 28) as currently music blocks has a set of dedicated keyboard shortcuts but in the case of musical keyboard they will be replaced as per the proposed design.

Old menu -



Figure 26

New menu -

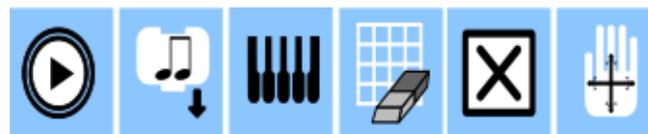


Figure 27

New Button -

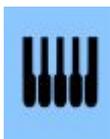


Figure 28

I would also propose to add a new section in the widget which will display the notes played along with their duration(Figure 29).

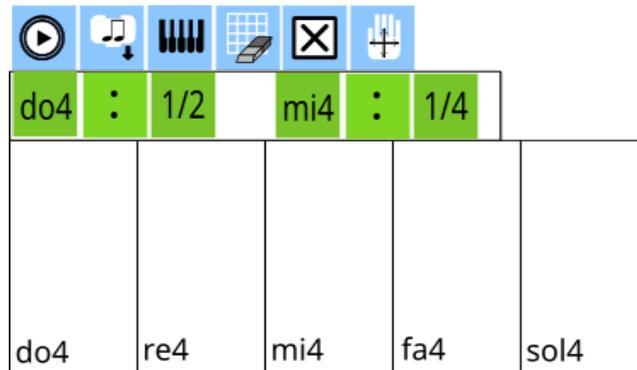


Figure 29

If the user pressed do4 and mi4 simultaneously for $\frac{1}{2}$ and $\frac{1}{4}$ seconds respectively (this section will only show the last 2,3 notes played)

Timeline

I am dividing the project into two parts. First I will implement all the features inside phrase maker and the move on to musical keyboard.

Durations	Goals
12 May - 18 May	Start working on the idea. Getting up to speed with working of the project
19 May - 25 May	Create designs and start working on widget toolbar.
26 May - 1 June	Try and implement the divide note mode functionality for rhythm and tuplet note blocks.
2 June - 8 June	Streamline the note division process between blocks inside the widget and widget table.
9 June - 15 June	Implement the note division function for simple tuplet and imported rhythms generated from rhythm generator. Implement the number of divisions button and integrate it with edit note mode for rhythm and tuplet note blocks
16 June - 22 June	Implement the add note function and streamline it with blocks.
23 June - 29 June	Buffer period to complete any remaining work and getting the work done till now evaluated by the mentors
30 June - 6 July	Implement the delete note function for rhythm and tuplet note blocks.

7 July - 13 July	Implement the delete note function for simple tuplet block and streamline it with widget blocks.
14 July - 20 July	Start working on musical keyboard and understand how it works.
21 July - 27 July	Buffer period to complete any remaining work and getting the work done till now evaluated by the mentors
28 July - 3 July	Implement the capture keypress duration function in musical keyboard.
4 Aug - 10 Aug	Complete the last note played function for rhythms inside musical keyboard.
11 Aug - 19 Aug	Implement the play from keyboard feature in musical keyboard.
20 Aug - 26 Aug	Buffer period to complete any remaining work and submit my code for final evaluation.

Sugar Labs' Motivation

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

To get familiar with the codebase, I have made a few contributions to Music Blocks
Link -

<https://github.com/sugarlabs/musicblocks/pulls?q=is%3Apr+author%3Aparsh0204>