

GSoC 2016 PROPOSAL FOR GCOMPRIS

PORT OF GCOMPRIS TO QT QUICK

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Proposal Title: Port of GCompris in Qt Quick

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ABSTRACT

GCompris is a high quality educational software suite comprising of numerous activities for children aged 2 to 10. It is about enhancing knowledge of children in a very non-traditional way. It involves presenting an educational topic in such a way that kids find it interesting and have fun while learning them. During the GSoC, I propose to add three types of activities to the GCompris educational suite which are as follows:

➤ **Peg Solitaire Board Game:**

It is a single player strategy board game. A game board with holes contains pegs in all but one (usually the center). You have to remove the pegs one after the other by jumping horizontally or vertically over one. In the end one peg should be left in the center hole. It would be a great addition to the game collection in the GCompris suite. The general code structure can also be used to further code for English Draughts (Chinese checkers).

➤ **Jumbled:**

Jumbled is a common and important word puzzle game with a set of words, each of which is “jumbled” by scrambling its letters and a clue (usually a drawing). The clue and illustration always provide hints about the answer phrase. Modified version of this will include jumbled letters, jumbled words and jumbled sentences. The game will be different from Classical Hangman as it will contain words and sentences also and will only contain pictures as hidden clues. The most important aspect of this activity of this will be that I will try to write a general code which generally uses in place dynamic rearranging of objects which can be letters, words, sentences, images etc. This can help in constructing many games such as increasing/decreasing order of numbers, food chain, and a lot more!

➤ **Port of Piano Activities:**

Being a keyboard player myself, this type of activity would be most interesting for me to port. I will port two activities in this section as follows:

- **Name that Note Activity:**

In this activity, a single note will be played in staff notation and the player has to play it on the piano. It will consist of various levels in which some of them will be color coded (i.e .the player can find the note played by matching the color of the note to the key in the piano) whereas some of the notes will just show position in the staff notation and player has to identify it on the piano and in the rest of the levels, the note will be invisible and player has to guess just by listening.

- **Play Piano Activity:**

In this activity, a series of notes will be played in staff notation and the player has to play it on the piano. This activity’s code structure will be exactly the same as Name That Note, only the datasets would differ.

MOTIVATION(WHY GCompris?)

When I started searching for GSoC organizations, my aim was to find an organization which not only includes writing code but also lays equal importance on the ‘fun’ part while writing the code. Being a GUI and game developer, GCompris is the perfect choice for me. The educational games in GCompris require high level of creativity as they had to be equally educational and fun to play but at the same time not to addictive or replace a teacher. I think that in such educational suite games should be made such that the code is **reusable** as many different activities can be made from same code. The activities that I have chosen all contain the above mentioned aspect. So, basically instead of three activities I see myself contributing to **at least ten activities.**

WHY ME?

First and most important reason of all is that I love to code. I am quite familiar with Qt Quick platform and also have a working knowledge of java script and GitHub. Besides this, I also know Photoshop which means that I can make svg images using inkscape quite easily. I think GCompris and I have some sort of connection when it comes to creativity for designing educational games for kids. GSoC will just be start of a long journey. I have so many ideas that I want the kids to play and GCompris is the one and only platform allowing me to do so. So, if you select me for GSoC program, I promise I will do my (best)^best.

IMPLEMENTATION

- Peg Solitaire Board Game:

In this activity, I will include different boards (shown in figure below) with increasing difficulty levels. Initially, I will start with a simple 6x6 square board. I will first include drag n drop of pegs and the main algorithm of moving orthogonally and elimination of peg while jumping on other peg. Then, I will, possibly try to add undo button for checking or changing moves and suggestion of moves on selecting a peg. Lastly, I will give a rating based on number of pegs as follows:

Excellent: one peg left

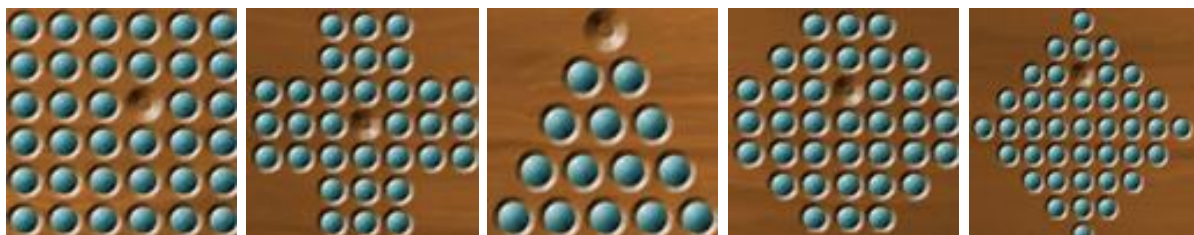
Very good: two pegs left

Good: three pegs left

You can do better: four or more pegs left

This will also be start a system of checking in GCompris suite where answers are not correct or wrong but they can be rated as described above.

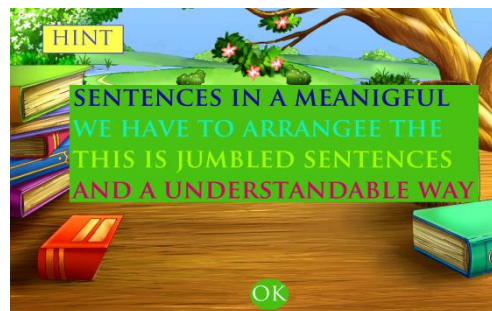
Following are the designs of the boards which will be included:



- Jumbled:

In this series of activity, I will start with jumbled words activity. There will be a background image, jumbled words in the center, 'ok' button to the right side of the screen and a hint button on the top of the screen besides the instruction panel. The jumbled words will be chosen at random from datasets for that level and the player can drag n drop the words and when he thinks that the word is made, he can press ok which will go to next level if the answer is correct or tell the player to check answer if it is incorrect. On clicking the hint box, a popup window will display a picture or a series of picture (in case of jumbled sentences) which will be related to the word/sentence/paragraph given.

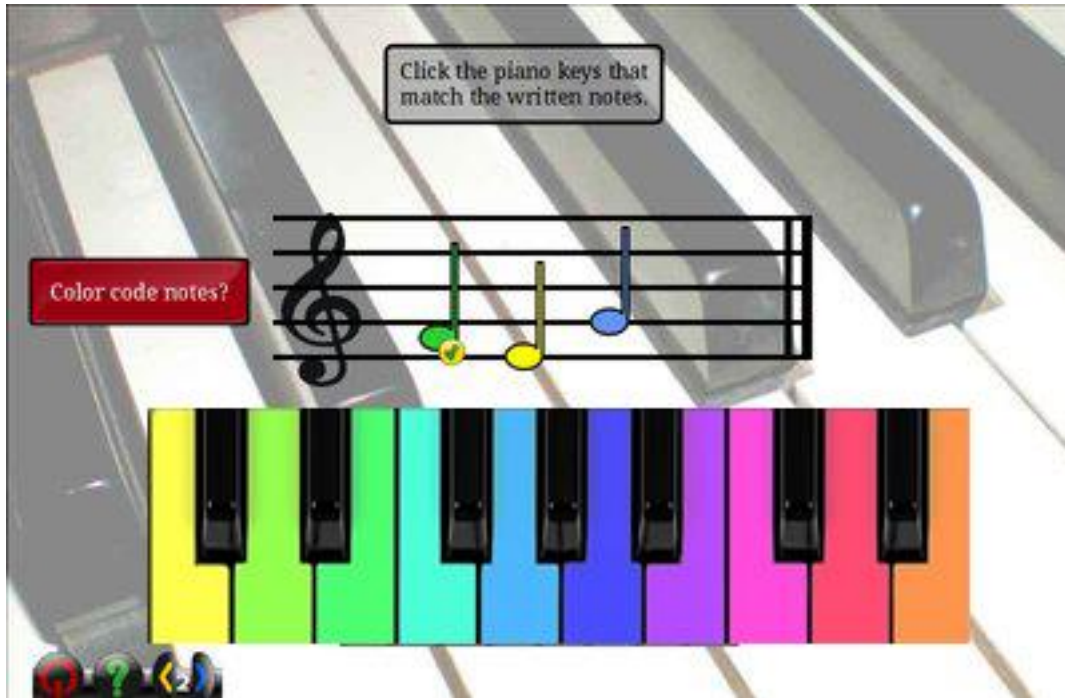
Following are the basic designs of three activities (please ignore the spelling mistakes):



- Piano Activities:

In this activity series, I will first start with Name that Note activity in which at the center of the screen note will be displayed in staff notation which will be clickable and can be clicked to hear the note again and again. In the bottom center, there will be an colorful interactive piano containing two scales. Levels will divide into two part: treble clef and bass clef and further divided into sublevels which will include notes from color coded notes to black notes to invisible notes.

For Play Piano Activity, I will use the code for Name that Note and for adding series of notes, instead of single element notes, I will change it to 1-D array of notes. In the instructions window, there will be short guide to position of all notes in staff notation. Following is the basic design:



TIMELINE

Activity-Wise Timeline:

- Mirror Game Activity : Before GSoC
- Peg Solitaire Board Game : 3 weeks
- Jumbled : 4 weeks
- Piano Activities : 3 weeks

Week-Wise Timeline:

Before 23rd May:

Complete the mirror game activity and start preparation for Peg Solitaire Game. Create prototypes and UI designs.

23rd May to 15th June:

- Week1

Coding Begins!

Start the simple design for peg solitaire and implement algorithms for moving pegs

- Week 2

Design other boards and modify the algorithms for others or try to generalize it. Add the rating method.

➤ Week 3

Add other features such as undo button, suggestion of moves. Add sounds and enhance graphics. Transition into Jumbled Activity.

Work till now will be submitted for midsem evaluation.

16th June to 14th July:

➤ Week 4

Start coding for general UI design, general objects (letter, words, sentences, images) in the center with variable lengths and in place dynamic shifting of objects by Drag n Drop.

➤ Week 5

Add other features such as checking system and optional hint window boxes(which can contain textual hints as well as pictorial hints)

➤ Week 6

Set the modes for letters, words, sentences, images and start working on javascript and datasets for jumbled letters, words and sentences.

➤ Week 7

Finish the activity by adding sounds, hints, backgrounds in each activity. Transition into Piano Activities.

15th July to 7th August:

➤ Week 8

Start the UI design for Name that Note Activity. Adding a keyboard with clickable keys (may have to program each key). Adding staff notation for treble and bass clef separately.

➤ Week 9

Create the game logic for Name that Note and datasets. Add sounds and animations. Try to possibly, add a tutorial in the start with all notes and their position in staff notation and keyboard.

➤ Week 10

Using the Name that Note code for Play Piano Activity. Modifying the UI design for adding and playing more than one note and changing the game logic for checking the keys pressed on the keyboard.

7th August to 15th August

Just to be on the safe side, I have left this period for some extra time if I lag behind from my schedule. Otherwise, this will include adding extra features in all of the three activities, checking for mobiles and tablets and start documenting of Peg Solitaire Activity.

15th August to 23rd August (Pencils Down)

Start structuring and commenting code for all activities. Debugging bugs and making code more efficient and less CPU usage. Getting reviews from all GCompris members and my college friends. Submitting the code.

GSoC Successfully Completed!!

After GSoC:

Obviously, I am not going to let go of GCompris that easily. I have already planned out some harder activities which require more time:

Chinese Checkers(English Draughts):

This is a two player strategy board game and I think the code will be somewhat familiar to Peg Solitaire. I did not chose this for GSoC because I wanted to make single player against tux which will obviously take complex AI algorithms and require significantly more time.

Port of Piano Composition Activity:

This is extension of Play Piano Activity which involves the player to make music themselves and then play it thus improving their composing skills.

Do you have other obligations from late May to early August?

My exams will get over by 15th May. After that, as a second yearite, every student has to go to practice school from 20th May to 15th July (most probably in my home city Bangalore) which actually increases our work experience. But, the working hours in a practice school is at most 4 hours a day, so I assure you that this will not affect my work and I can easily provide 6-7 hours a weekday and about 10 hours on weekends to my GSoC project. (i.e. about 45 hours a week)

ABOUT ME

I am a student currently in second year, pursuing Bachelor of Engineering degree in Computer Science in Birla Institute of Technology and Science, Pilani Campus (BITS Pilani).

I am a GUI and game developer. Besides this, I also develop android apps and web apps. I know Qml and Java script enough to make creative games for kids. An added advantage would be that I am also a graphic designer, so I can easily create svg images.

I have taken part in lots of developing competitions. I have completed an app in 24 hours in an event 'code.fun.do' by Microsoft, two times. Although I am pretty new to the open source world but the idea of sharing is taking over me at great speed.

I am a very hard working and dedicated guy, somewhat punctual also. Given a chance to participate in GSoC program, I am sure I will make my mentors proud and put my full effort to make GCompris better.