

GSOC Proposal

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Proposal Title: Finishing started activities for GCompris(KDE)

Motivation for Proposal:

What is GCompris ??

GCompris is a high quality educational software suite comprising of numerous activities for children aged 2 to 10.

Some of the activities are game orientated, but nonetheless still educational.

So, contributing in a project which teaches small children ignites a spark of interest in me & motivates me to contribute to the project.

My Goals:

This time the main focus will be on completing the existing pending activities so i am planning to complete these 3 activities this time :-

- 1. Multiplication_tables**
- 2. Computer parts**
- 3. Digital electricity**

Implementation Details:-

1. Multiplication tables:-

This activity was part of my season of KDE. This activity helps children to learn and memorise different mathematical & literature concepts like mathematical tables, grammar, etc in a fun way.

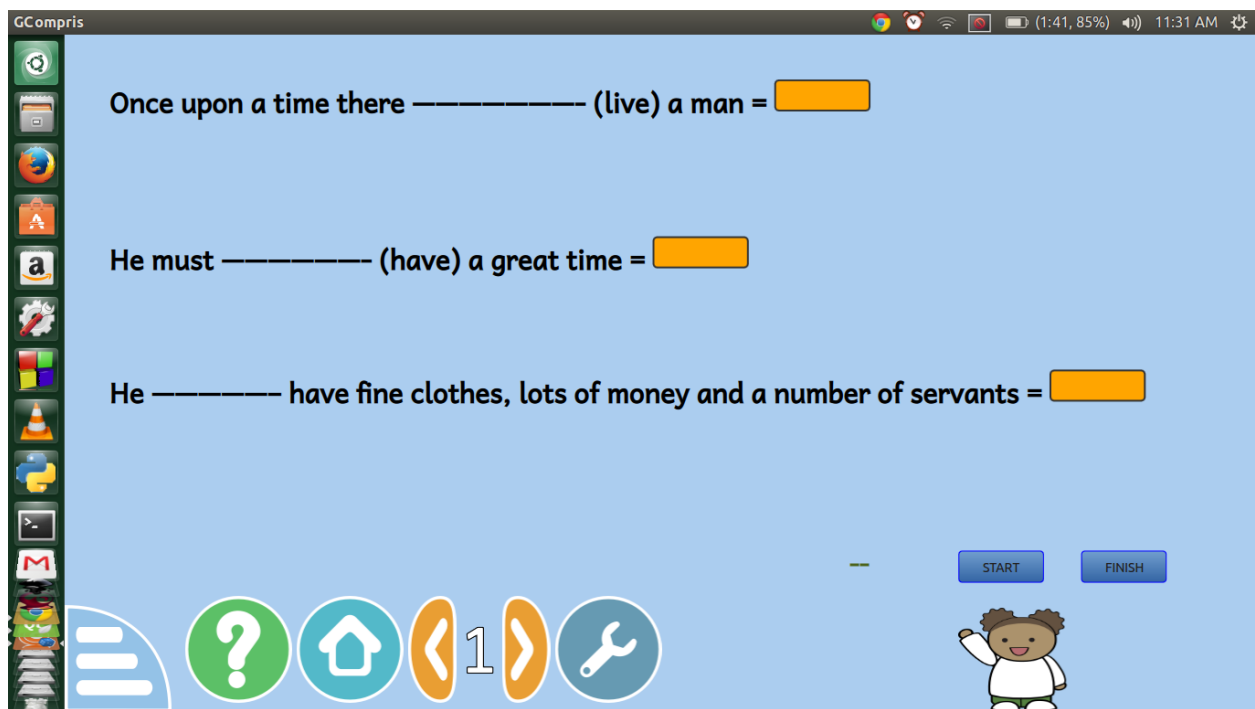
The activity has two modes:-

- a.) All Questions (Built-In mode) :-** display all the questions from dataset in different levels.
- b.) Chosen Questions (User defined mode) :-** only the questions chosen by user will be displayed.

The current state of this activity is as follows :-

Task completed :-

- 1.) Both modes i.e Chosen questions (User defined mode) and All questions (Built-In mode) are completed.
- 2.) Scroll view is implemented for Chosen questions (User defined mode) so that the user can select as many questions as they want without disturbing/breaking the UI.
- 3.) The idea of activity is to make it generic so that it can be used for any time of questions like grammatical , textual questions, etc.



Mock Up screen when textual questions like grammar are used in Dataset

Remaining tasks :-

- 1.) In the chosen questions (User defined mode) the order of chosen questions should get changed every time the user switches to another level.

The order of selected questions will be same for every student to create a healthy competition among them. Also, on changing the level, the selected questions will be displayed in different order. This can be achieved by using `rand()` and `srand()` functions of C++.

srand() :- Seeds the pseudo-random number generator used by `rand()` with the value seed. If `rand()` is used before any calls to `srand()`, `rand()` behaves as if it was seeded with `srand(1)`. Each time `rand()` is seeded with the same seed, it must produce the same sequence of values.

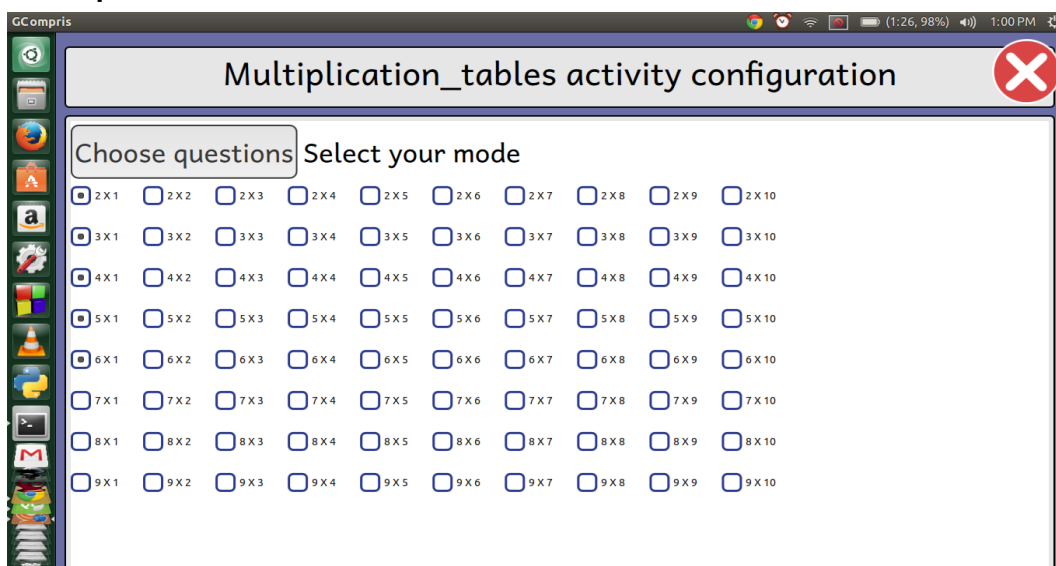
The above seed functionality can also be incorporated in Javascript by using a custom seed method like `('0.'+Math.sin(x).toString().substr(6))`.

Link :-

<https://www.google.com/url?q=http://stackoverflow.com/questions/521295/seeding-the-random-number-generator-in-javascript&sa=D&ust=1491165327774000&usg=AFQjCNHbL8R2pKLKahOAAERhjjV0R338bg>

Here, for each day of the week, the parameter in `srand()` function will be changed so that `rand()` function generates different order.

Mockups :-



- 1.) First, the user will select the questions to be displayed.



2.) The selected questions will be displayed to the user.

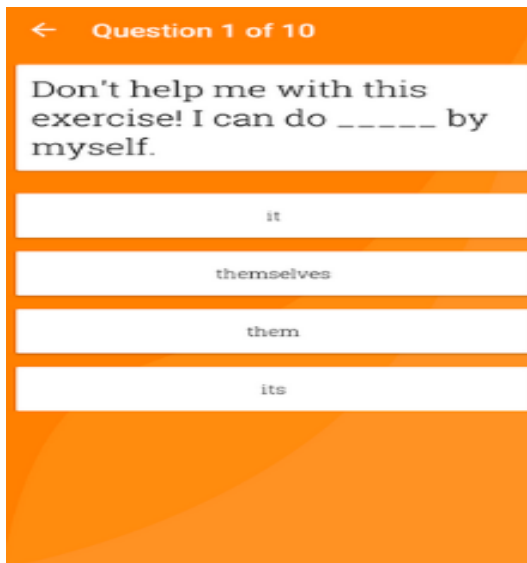


3.) On clicking on next level the questions will be same but with different order.

- 2.) Some minor code fixing & addition of small features is remaining.
- a.) For example, when user is selecting questions in User defined mode, there should be an option to reset all the selected questions instead of manually deselecting them one by one.
 - b.) Also, at present the activity shows total time taken by the user to answer particular set of questions. So, there will be an option in settings window to turn the timer on or off.

Current status :- https://github.com/KDE/gcompris/tree/sok_nitishc_multiplicationtables

- 3.) For mobile & tablets, where screen width is less, I am planning to display all the questions in scroll view with questions at the top & space to write answer at bottom of it.



Here the user will scroll down to get the next question and so on. Instead of 4 options there will be edit text having width equal to parent and the next question below it. So, this way very long answers can also be handled.

2. Digital electricity:-

In digital Electricity activity, the user is presented with lots of digital components (components having I/O as '1' or '0'), like AND gate, OR gate, 7 segments display, etc. The user has to drag and drop the components from sidebar into the workspace, and connect them to '0' or '1' or with another component. The output of the component is updated according to its logic.

The original plan was to create two modes of Digital Electricity :-

- 1) Free play mode** – In this mode, children can play with the digital electricity components, connect them together, give various inputs and check the corresponding output.
- 2) With goals and levels** – In this mode, children will have to complete certain tasks to move to the next level.

Current status:

Link :- https://github.com/KDE/gcompris/tree/gsoc_pulkit_digital_electricity

1.) Free play mode: most of the free play mode is complete.

Only one thing is left:

a) On tablet/phone it's quite uneasy to select one of the 4 buttons on top (erase, info...). So, that problem has to be resolved by changing their dimensions.

2.) With goals and levels: This is yet to be implemented. All the levels except last level will be part of this mode & the last one will be Free play mode.

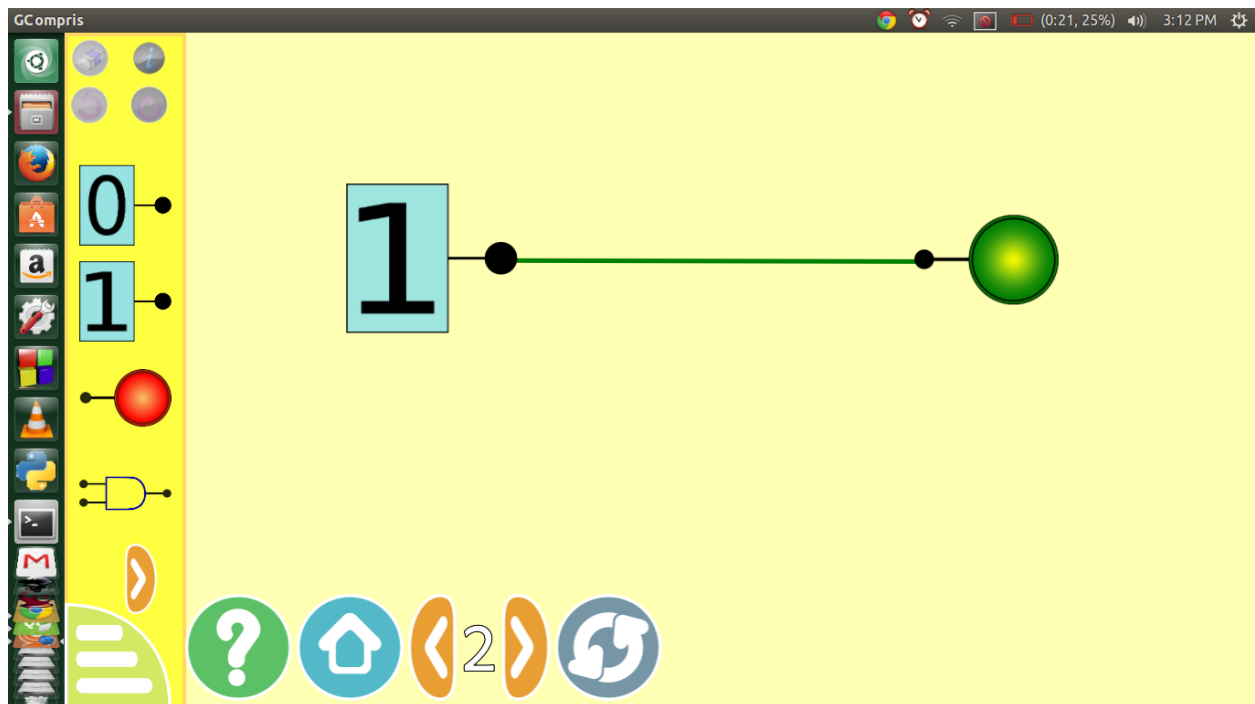
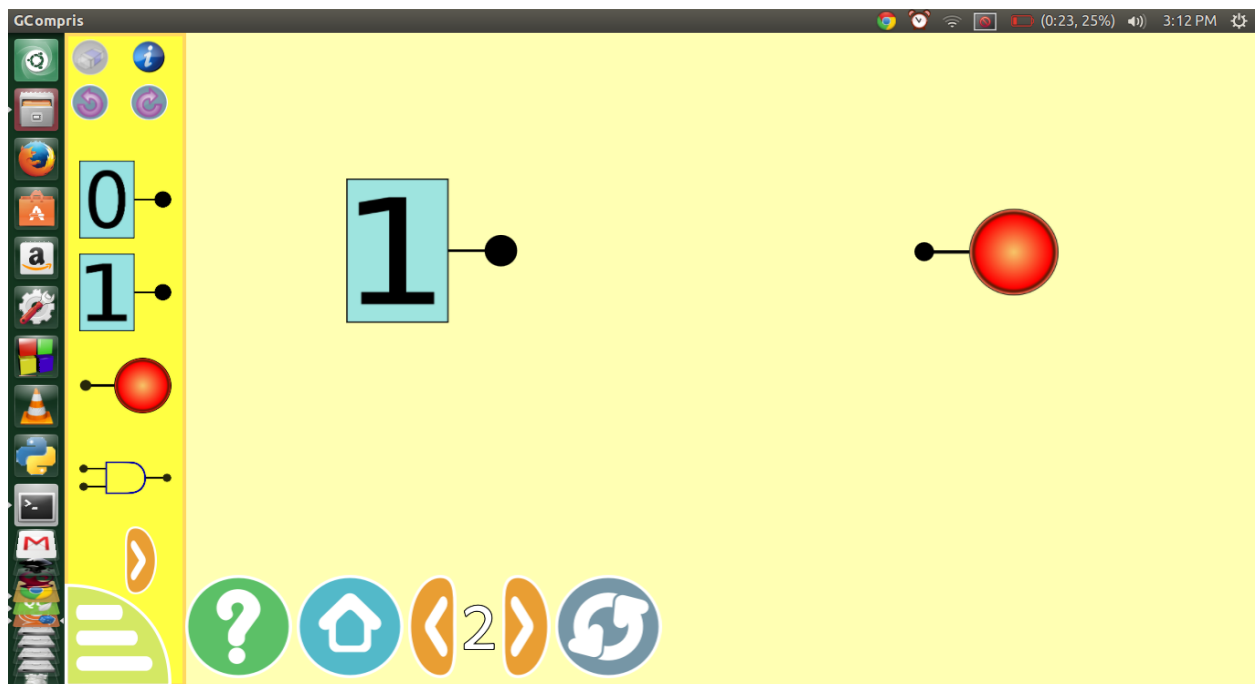
So, a separate activity for this mode is not needed.

Some description of this mode is:

Upon starting of each level, a dialog box will be displayed showing hints to childrens in order to help them to complete that particular level.

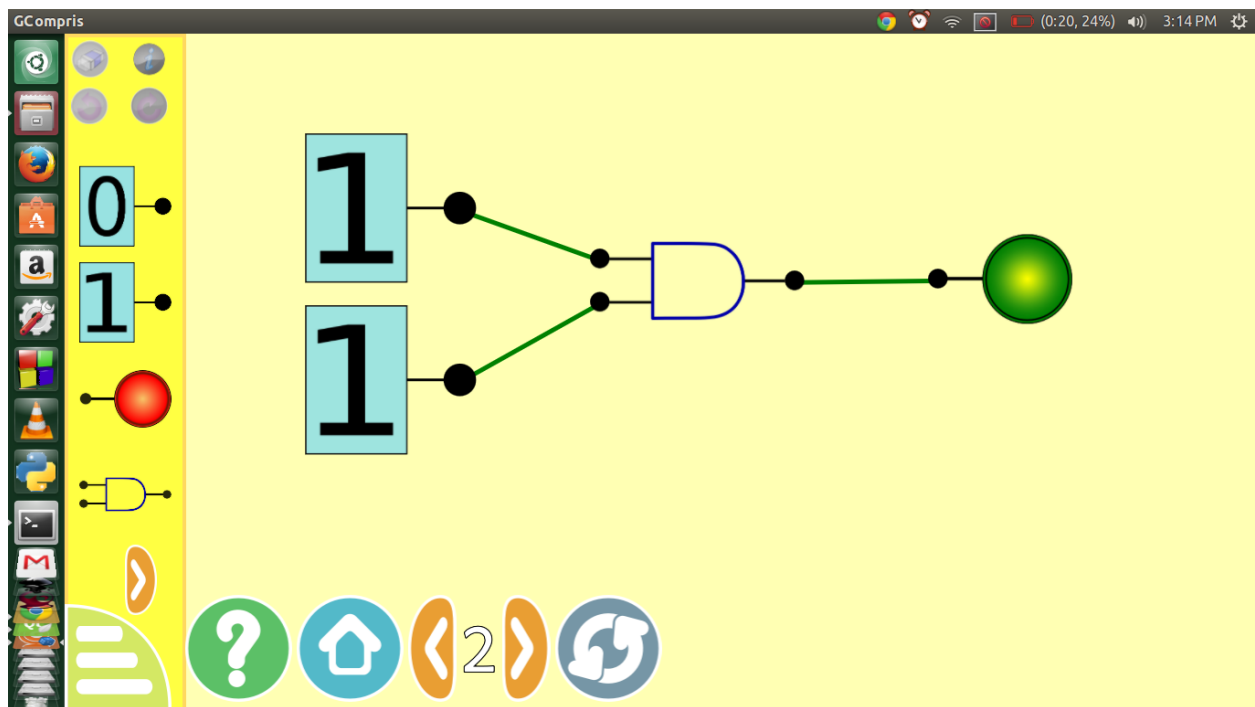
a) Examples of some tasks which will be presented in different levels are :-

1.) Bring a LED to light.



The children can achieve this by simply using 1 input & connecting it to led input gate.

2.) Bring a LED to light through a AND gate



This can be achieved by the user by connecting two 1's to the input terminal of AND gate & finally connecting outer port of AND to led's input.

b) In Initial levels, all the required components will be displayed, and children will just have to connect them together. The order of components will be randomized each time the level is played to keep things interesting.

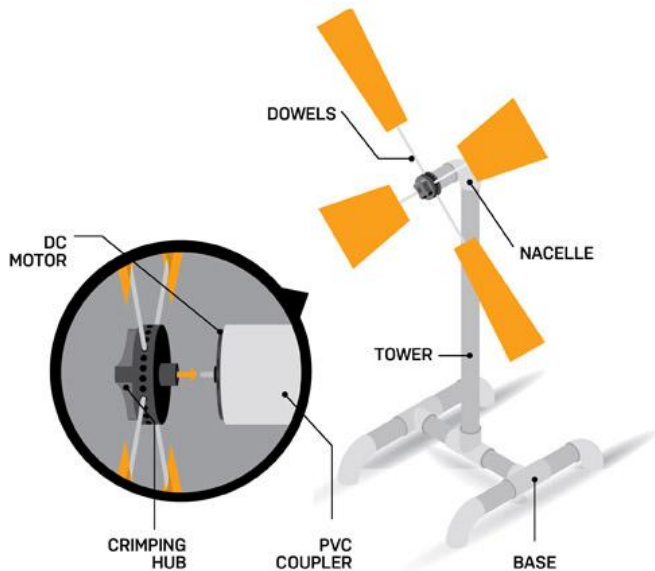
c) As they progress, only some components will be displayed and rest of the needed components would have to be placed by children, and they will have to connect them together.

d) In later levels, children will have to place all the components themselves and connect them together. The difficulty of tasks will also increase as the level increases.

My plans :-

- is to complete remaining work of this activity within a set timespan as this activity is very useful in teaching the most fundamental principle of Electronics to children's which will definitely help them in future.

- I am also planning to include some more components like Rotating motors & windmills which will make the activity more fun. For example, children will be asked to make a simple windmill using electric components like motor, battery , wires , etc.



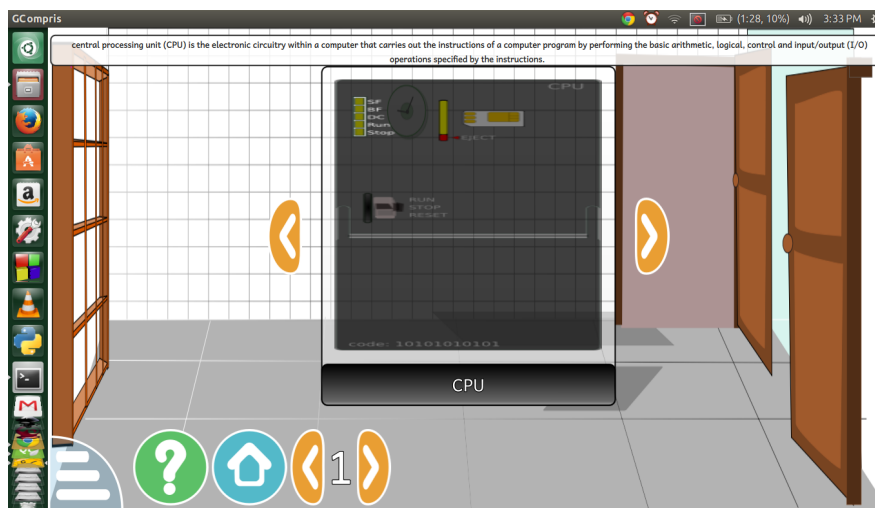
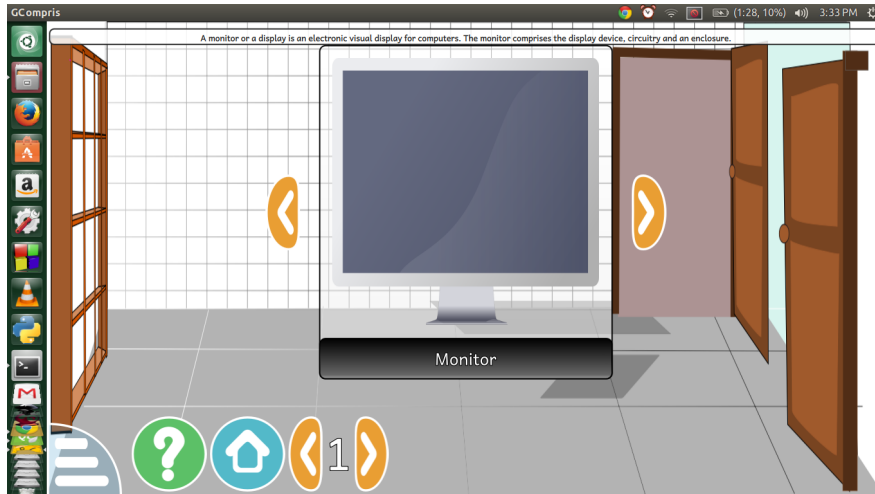
3. Computer parts :

This activity is aimed to teach about computer parts like CPU,monitor,mouse etc to the children in a fun way so that they can know how a computer operates.

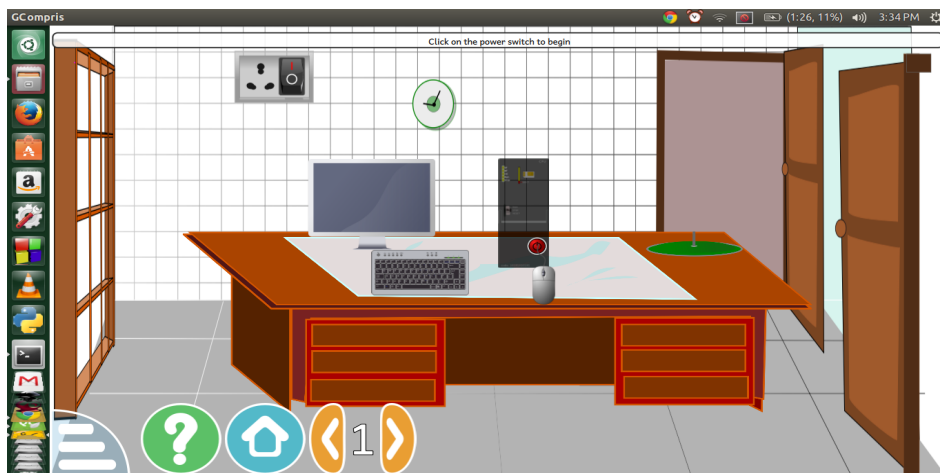
Current status :- <https://github.com/KDE/gcompris/tree/gsoc-sagar-computer>

Following features have been completed :-

- 1.) An image of a computer part like monitor, CPU etc is shown at the screen with the complete description about it's function & use is displayed. The main aim here is to make children aware & familiar about different computer parts.

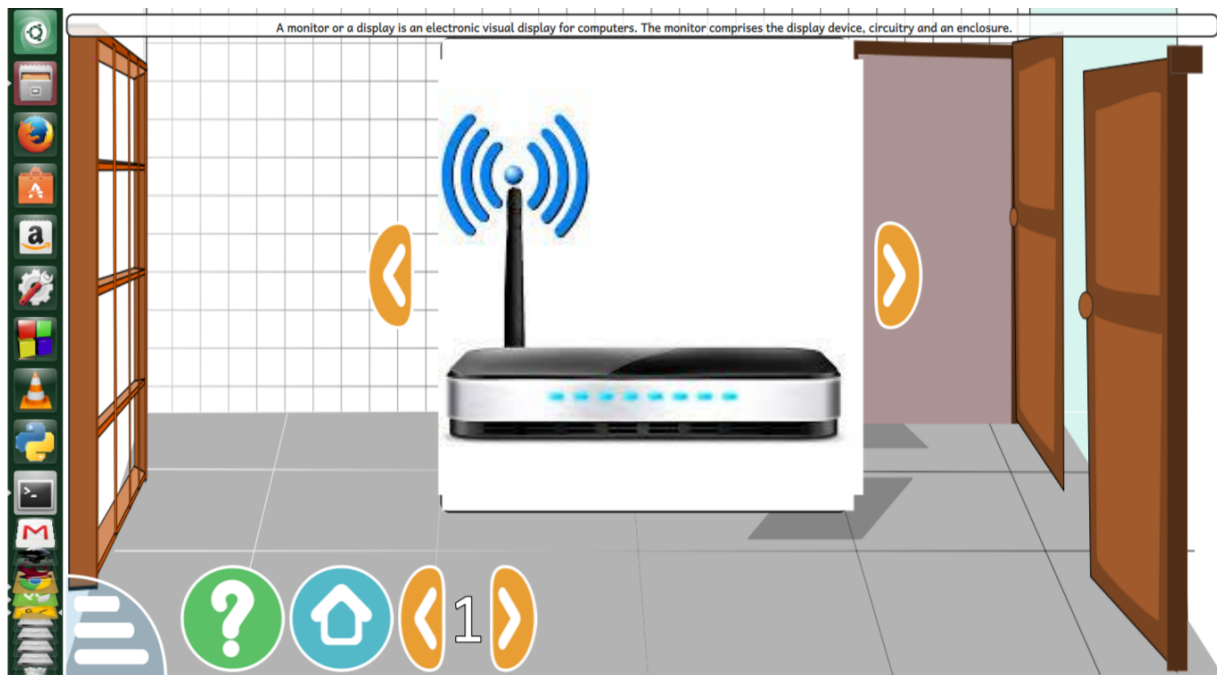
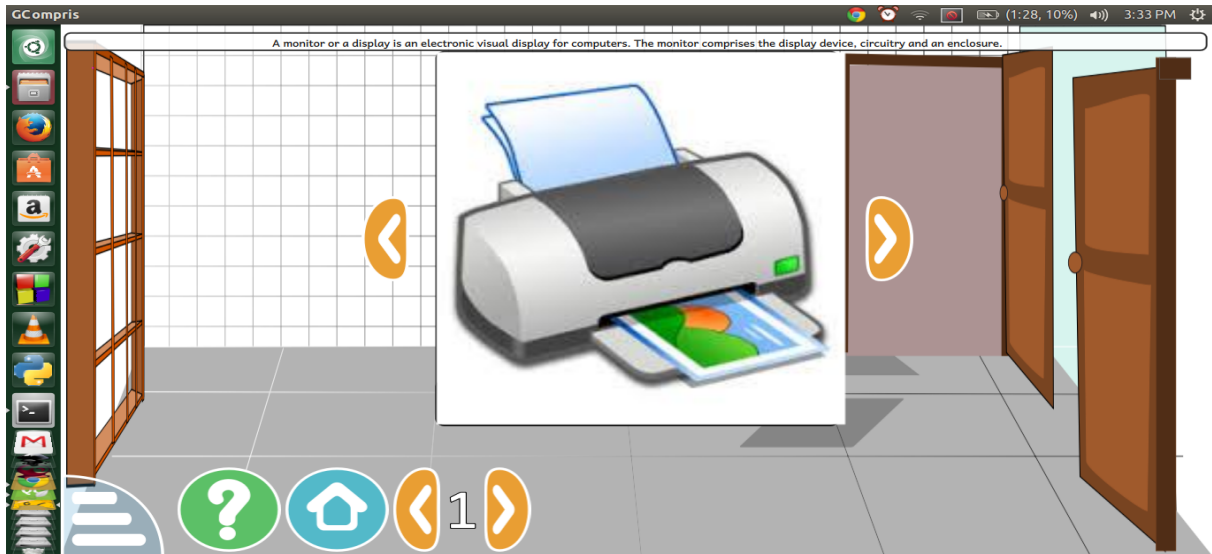


- 2.) Visual Demo feature is also completed where the children have to actually interact with the computer system according to the instructions.



Features pending :-

- 1.) The user has to place the text buttons present on the side of the screen to the correct components. There will be a audio support and text(using tooltip) to aid the user and understand the parts.
- 2.) The activity is not completed yet, so my plan is to complete the activity upto that level where it has all the basic functionality & all are working.
- 3.) I am also planning to add some more components like printer, scanner , wifi router , USB sticks , joystick , speakers , etc which nowadays have become essential part of our lives.



Timeline:

10 May 2017 - 28 May 2017 (Community Bonding Period):

- I will be discussing and brainstorming with my mentors about the proposed work mentioned in my proposal.
- Also, I will be figuring out how I have to approach & execute all my agenda's mentioned in my proposal.

30 May 2017 - 20 June 2017 :

Focus : Multiplication tables activity

a.) 30 May - 10 June

- In School mode(Chosen questions), the feature where the selected questions are displayed in random order upon clicking on level button needs to be implemented during this period. I will be using JS random function for this.

b.) 11 June - 20 June

- Small features like a reset button which will reset all the selected questions instead of deselecting them one by one in School mode needs to be implemented.
- Apart from that, some code cleaning up needs to be done like proper variable names, code comments, etc.
- Also, testing of activity with real children's needs to done.

22 June 2017 - 22 July 2017:

Focus : Computer parts activity

a.) 22 june - 5 july

- Focus will be to add more computer parts like printer, scanner ,USB stick , wifi router in the mode which displays all the computer parts with their description to students.
- June 26 - June 30 :- phase 1 evaluation will take place.

b.) 6 july - 20 july

- I will be working on the mode where user has to place the text buttons present on the side of the screen to the correct components.
- There will be a audio support and text(using tooltip) to aid the user and understand the parts.

c.) 21 july - 22 july

- Testing of activity with real children's needs to done.

24 July 2017 - 21 August 2017:

Focus : Digital electricity activity

a.) 24 july - 15 August

- 24 july :- phase 2 evaluation.
- Free mode of the activity is almost complete. I will be working on pending issues like :-
 - 1.) I will be working on goals & level mode. All levels except the last one will have this mode where the user will be given a problem statement to solve.
 - 2.) I am also planning to add some more components like rotating motors etc which will make the Activity more fun. During this period i will be working on this feature.

b.) 16 August - 21 August

- Code cleanup like proper variable name, comments , etc will be done.
- Testing with children will be done for their feedback.

22 August 2017 - 30 August 2017:

- During the final week , I will be testing all 3 activities for some edge cases & bug elimination with the help of mentors.
- Final submission of code take place for evaluation.

Availability:

I am available full time during the entire GSOC 2017 period. I have no other commitments during this period.

Typical Working Hours: 10 am to 12 pm, 2pm to 4 pm , 9pm to 11:30pm IST (6 days a week, amounting to 40 hours per week.)

Other Commitments: None

Why I consider myself the right person for this task?

In addition to all the skills required for project, I have a never give up attitude.

I'm very much passionate about this field and will fully devote my Skills & time in order to develop a great project with the organization.

I am a quick learner & very much willing to learn new technologies & Hacks.

I'm an avid coder who learns quickly, so if anything new is to be learnt in the process I would be able to give my best shot. Meeting the deadlines, Interacting with new people , debugging the code are some of my other skills set.

About Me:

Myself Nitish Chauhan ,an undergraduate final year student pursuing B.Tech from LNMIIT,India.I am a tech freak who loves to code in C++ & python. I also loves contributing to open source projects.

I have been contributing in kde for past 7 to 8 months so now I am quite familiar with the code structure & code flow of gcompris.

I started contributing in gcompris by adding two new Activities named **Drawletters** & **Drawnumbers** where children have to draw different alphabets & numbers by connecting the dots with mouse click.

Links :-

1.) Drawletters :-

<https://github.com/gcompris/GCompris-qt/commit/1af09b76f0b5f42b5e5658b59b69a8c0da8d85ac>

2.) Drawnummbers :-

<https://github.com/gcompris/GCompris-qt/commit/532f73c9fbac4b67340159b4efcf158f44f75251>

Recently, I successfully completed Season of KDE'17 under the mentorship of Johnny,Emmanuel, & Sagar.

The status of SOK can be tracked with following links :-

1.) https://season.kde.org/?q=view_projects&prg=41&p=626

2.) https://cgit.kde.org/gcompris.git/log/?h=sok_nitishc_multiplicationtables

I love competitive & Backend coding, therefore I am quite good in searching for a optimised solution for a problem.I have good experience in frameworks like Flask, pyramid & Django. I have good understanding of Git & MVC pattern. Also, knows the use of code review platforms like phabricator & Jira.Apart from that I am also familiar with Java,JS,QML and Qt. Familiar with databases like Mysql, sqlalchemy, & Elasticsearch.

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BLOG :- <https://nitish18blog.wordpress.com>