GSoC proposal for GNOME (GCompris)

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Why GNOME (GCompris)?

I was introduced to FOSS about a year back where I began using Gnome and absolutely loved it. Since then it has been a total learning experience. GNOME lets me customize things and is an amazing environment to work on. Things like the Application Desktop Launcher, GCompris, Gedit, etc. are reasons why I like using it. It is the feeling of having everything at my fingertips that makes me love it.

I find GCompris a fun and innovative way for kids to learn various basic concepts and the best part is that it allows free and open source education to students**.** I would like to work with GCompris because it uses Python (something I have good working knowledge of) plus it also gives me the chance to create graphical user interfaces using PyGTK and PyGooCanvas and make complete games for kids. The very thought of having kids I know (which includes my cousins) use activities I made to learn new things is one of the most exciting things about doing this project.

This being my first GSoC I feel it would be a great opportunity to learn a lot more about Python (something I've really enjoyed coding in) and get more closely involved with the GNOME community.I do not intend on stopping with just this GSoC but plan on continuing to contribute to GNOME. My exams would end in April itself after which I have absolutely free vacations for about 3 months. Therefore, I can complete the code on time as per the required schedule and definitely hope to complete the project in a professional manner. All in all I hope to have a really good time working on the project.

Abstract

Since GCompris focuses on learning while playing for children, it is important to take note of what catches the attention of the child. It has been noticed that bright colors and peculiar sounds keep them engrossed in the activity. The content has to be meaningful and pertain to issues that are commonly concomitant with society. No doubt the games should be interesting for the kids, but there should be an attempt that the learning from the games help them in their academic knowledge, and some games should also enhance their knowledge/awareness on social values. With cases of child obesity and other health issues being a major concern globally, it would be a great idea to make the children understand the difference between healthy food and junk food through interesting games.

There are two sections that I would be focusing on:

- Science section:
The mystery of space is probably one of the most intriguing and fascinating things for kids of almost all ages but learning about the solar system can be boring if done through static presentations. GCompris always presents activities that complements a book and for which the computer may help the child to learn something interestingly. So, keeping these things in mind I would like to create two space related activities that would experimentally help kids learn more about –
1) The concept of gravity.
2) The orbital speed - distance relation.

- Miscellaneous section:
1) Environmental pollution is one of the major problems in the world today. The large amount of waste disposed is one of the major causes of this problem. Classifying garbage can help reduce environmental pollution and enhance the quality of the recycling and may be beneficial to domestic recycling industry. My task would be to create an activity that would help kids classify garbage into various categories thereby promoting the - “reduce, reuse and recycle” motto.

2) The food groups are a simple way for children to break down and understand their dietary needs, thereby helping them make healthier choices while eating. Foods are classified into five food groups based on similarity of agricultural base and traditional classification and usage of the food. Foods within each food group also contain similar nutrients that contribute to an overall healthy eating pattern. I would like to create an activity that would help kids identify the various categories thereby, promoting healthy eating.

Proposal:

To create four activities touching two sections of the GCompris software.

1) Land Safe: In this activity children would control a spaceship that moves on the 2D screen. They would have to land it on the specified landing area without crashing, by controlling the thrust using right/left/down/up keys. After each safe landing the gravity will change (i.e. they will land on another planet with a different gravitational force).

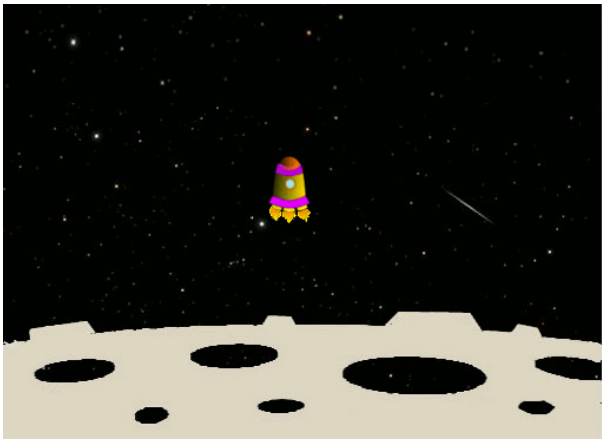

Fig 1: prototype art for game Land Safe

2) Place your Satellite: A rocket will be launched into space where the escape velocity of the rocket will be mentioned. Sliding on to the next screen kids will get to place their satellite in an orbit by controlling the speed and distance from the planet. By doing this, they can experimentally understand how the gravitational pull and satellite's inertia of motion need to be balanced for it to stay in orbit.

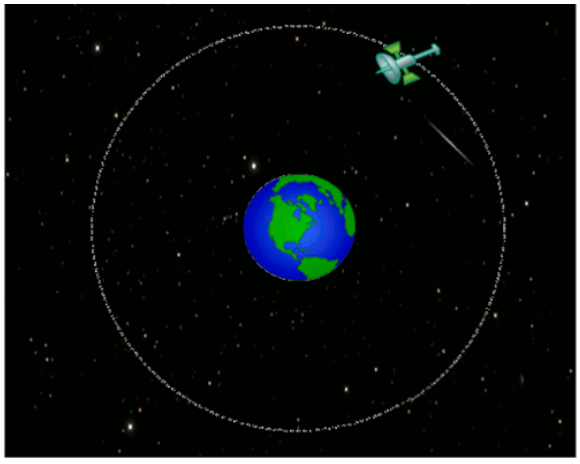

Fig 2: Rough art for game Place your Satellite [19][20]

3) Food Classification: There would be various levels for the various food categories. At Each level a particular food group would be mentioned (e.g. Fruits) and different food items would be present. Kids will have to make GMuncher (a character) eat only the items belonging to that particular category. The importance of these food categories would be mentioned at each level and at the end of completion of the activity a food plate showing the recommended portions would also be displayed encouraging a balanced diet.

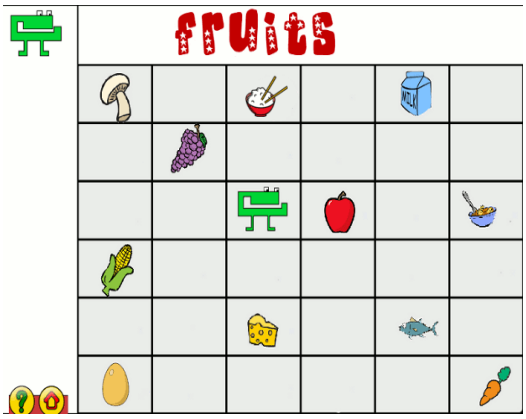

Fig 3: Rough art for game Food Classification
[1],[2],[3],[4],[5],[6],[7],[8],[9],[10]

4) Garbage Classification: The littered garbage will have to be classified into first only organic and inorganic. In the next level the number of categories would be increased - glass, plastic, metal, etc.

Fig 4: Garbage classification game (rough concept and art)
[11][12][13][14][15][16][17][18]

Working Methodology

- Get an insight into the interaction between GCompris core and the activity plugins. Thereby, attaining a deeper understanding of the internals of GCompris. In order to create a better system, deeper understanding is required. The interaction between GCompris core and the activity plugin can be explored by studying the API which includes - GNOME Canvas API and the Plugin API.
- Use pythontest which is a showcase activity to understand code by example.
-Create the activities using python template. Python template which is an empty python activity project will help to serve as a skeleton thereby, making the process of creating an activity easier.
-Collect content and images compatible with the GNU GPL and free for commercial use.
- Using GIMP and Inkscape, design icons, skins and logos. Basically create all the images that would be required in the activities keeping in mind not to include original text that cannot be translated later. The images need to be in sync with the look and feel of GCompris.
-Sketch the UI for the activities so that there is a clearer picture in mind while designing.
-Designing the user interface with PyGoocanvas to implement the canvas widgets and PyGTK for creating the GUI.
-Develop algorithms for the activities.
-Integrate the algorithms with the code.
- Create menus in xml format providing all the activity information, fields and tags. The information in the menus needs to be precise as it selects the plugin, describes the activity and also provides inline documentation.
-While coding for the activity use GCompris API to connect entry point to icon on menu and implement set of functions in order to be operated by core (both mandatory as well as optional entry points). Also, make sure that the activity code initializes the control bar with the relevant buttons and on the event of exit the activity cleansup and end entry connects back to the menu. The activity plugin should includes

Timeline

<u>April 24th - May 20 (Community bonding period)</u>
-Discuss the project in detail with mentor.
-Go through documentations of PyGTK, PyGoocanvas and learn how a UI is built.
-Create simple applications using python test and python template activities.
-Collect pictures, skins, icons, exact information regarding the activities(like speed - distance relation for satellites), design logos using GIMP.
-Sketch the UI for various activities to be built.
-Formulate use cases.
-Formulate algorithms for all activities.

<u>May 21st - July 10th (Coding period)</u>
- Design UI of two activities (Land Safe and Place your Satellite) using PyGooCanvas.
-Code for both the activities using python and by implementing the formulated algorithms.
-Complete code integration with UI.
-Test functionality of code written.
-Documenting

July 13th (Mid Term Evaluation)
Deliverables: Submit two completed activities - Land Safe and Place your satellite along with documentation.

July 14th - August 5th
Design UI for food and garbage classification activities
-Code for both these activities.
-Code integration of activity plugin with UI
-Reduce code complexity
-Test functionality of code written.

August 6th - August 13th
-Code refactoring
-Debugging
-Testing
-Documenting

August 14th - August 20th (Pencils down)
Buffer period (This time can be used for all the last minute tweaks as something can possibly go wrong)

A bit about me
I am a third year student pursuing Bachelors of Technology in Computer Science discipline at Regional Institute of Management and Technology, Punjab Technical University, India. I am well versed with Python and also with the community interactions of OSS projects, I use mailing lists, IRC and version control systems like Git and host all my code on Github so, I can start working on the project early.
I have been working with GCompris for some time now and have also reported two bugs (**#662576** [21] and **#662880** [22]) and also found a fix for the former. I have also added three levels in the "Locate the region" activity. From GSoC I hope to gain experience to be involved in a professionally managed Open Source project and am looking forward to it eagerly.

References:
[1]- http://www.clker.com/clipart-14097.html
[2][3] - http://www.freeclipartpics.com/fruit-clip-art-images.htm
[4][5][6]- http://www.freeclipartpics.com/vegetable-clipart-images/
[7]- http://www.freeclipartpics.com/freecheesewedgeclipart.htm
[8] - http://www.how-to-draw-funny-cartoons.com/image-files/cartoon-tuna-6.gif
[9] - http://www.clker.com/clipart-3921.html
[10] - http://www.clker.com/clipart-29011.html
[11] - http://www.clker.com/clipart-10873.html
[12] - http://www.clker.com/clipart-3929.html
[13] - http://www.clker.com/clipart-3933.html
[14] - http://www.clker.com/clipart-12931.html
[15] - http://www.clker.com/clipart-trash.html

[16] - http://www.clker.com/clipart-3985.html
[17] - http://www.clker.com/clipart-cracked-egg-1.html
[18] - http://www.clker.com/clipart-11816.html
[19] - http://www.clker.com/clipart-2172.html
[20] - http://www.clker.com/clipart-satellite-download.html
[21] - https://bugzilla.gnome.org/show_bug.cgi?id=662576
[22] - https://bugzilla.gnome.org/show_bug.cgi?id=662880

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