Porting activities in GCompris in Qt-Quick

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1. Motivation

GCompris is about teaching the basics in the most easiest way to children between the age of 2 to 10. The gtk+ version of GCompris was very well recieved, and from there it was decided to Qt version, to make GCompris available for all kinds of devices, like tablets. The latest version of GCompris is 0.70 and as of now it has 137 categories on various topics like science, maths, games and much more, fully supporting 15 languages.

My goal for the project is to port two experimental activities from the Gtk+ version of GCompris to the Qt version.

The best way to teach any concept is by demonstration. But it is not always possible to demonstrate everything that needs to be taught, such as the working of submarine and it's different parts. That's were simulation of real world problems come to play. The aim of this project is to simulate real world situations in two activities, *"Pilot a Submarine"* and *"Sea race (Single Player)"*

2. Project Goals

By the end of the Google Summer of Code's time period, I will be completing the following activities :

- **Pilot a Submarine**: It is a port to the Qt version of a strategic activity originally present in the Gtk+ version aimed to teach how a submarine works. It was started in this branch:

https://cgit.kde.org/gcompris.git/log/?h=gsoc-submarine

- **Garbage Recycle**: This activity is aimed to teach garbage classification. This was started in recyclebin branch

  Discussions:

  https://phabricator.kde.org/T339

- **The Solar System**: This activity aims at providing a basic understanding about our Solar System, it's planets and facts and properties of each of the planets.

3. Implementation Details

3.1. Pilot a Submarine

The *"Pilot a Submarine"* is to learn how a submarine works, explaining the usage of elements such as engine, rudders and air tanks, in order to navigate a submarine to a required depth.

- Since this activity was already present in the Gtk+ version, I will be using the svg and the audio files from the resources used in the Gtk+ submarines activity. This will allow me to dive into the coding part directly.

- There will be a tutorial at the start of the activity, which will give a brief description about the different elements (engine, rudders and air tanks) and it's functions.

- Firstly I will be implementing the submarine and the mechanics of it's elements, namely the engine, rudders and the air tanks. Once that is in place, I will then shift on to create various levels and it's variations.

- The activity will contain pickups in the form of jewels, as it was present in the Gtk+ version

- Besides the regular pickups in the Gtk+ version, there will be additional threats in the form of rocks and caves, in order to maintain an increasing difficulty curve, while still keeping it doable for children within the prescribed age limit.

- In order to enhance the experience, the overall activity and the movement of the submarine and the animations will be smoother compared to the Gtk+ activity.

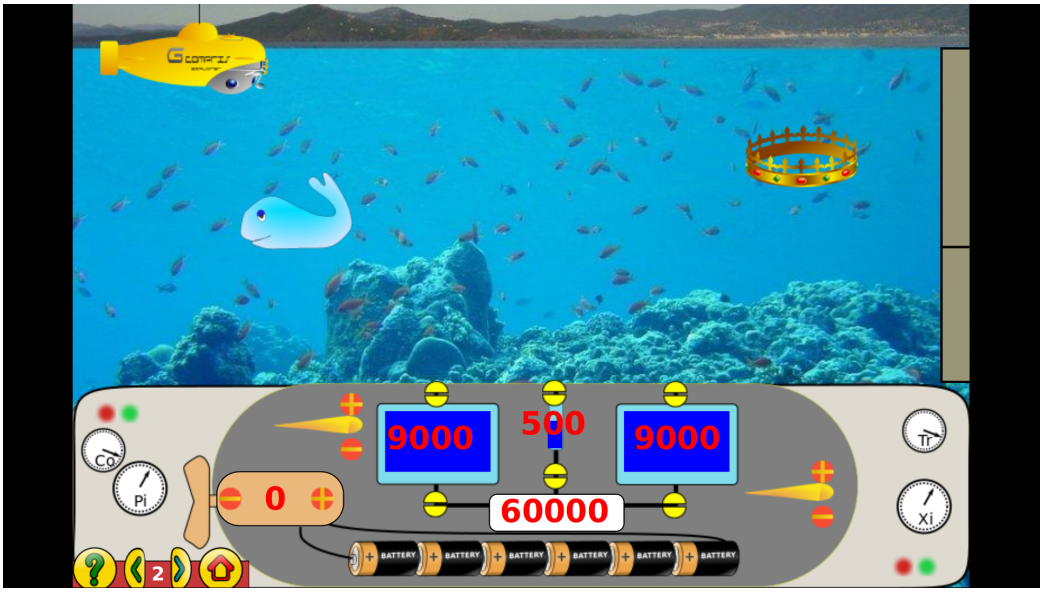

Figure 1: Submarine Activity

3.2. Garbage Recycle

This activity will be done from scratch as the implementation in the given branch doesn't match with the description. I will be using images from openclipart.org and it will have the following features:

- The activity will begin with a tutorial explaining the basics of different types of recycling procedure for different materials, along with the goal of the activity.
- Garbages of different types will be available in the table at the start of each level.
- The user will have to put the waste materials in it's correct recycling bin. On placing the waste in it's correct bin, it will be recycled properly. The goal of the activity is to correctly recycle each of the wastes as provided in each levels.

- Items will be placed on it's respective bin via drag and drop
- With progress of levels, there will be an increase in the categories of waste materials, in order to maintain a proper difficulty curve.

3.3. Object Arrangement

This activity will be created from scratch, in order to expand the current ordering activity to a more generic version of it. It will have the following features:

- Different types of objects will be provided at the start of each levels and the user will be asked to arrange them in a specific order (ascending or descending) based on a given parameter (height or weight)
- A toolbox will be provided to the user with the help of which the user can measure the required property of an item
- The measured properties will be marked on the object. If a property of an object is not yet measured, it will be marked as unknown.
- With the proper measurements, the user will then arrange the items in the correct order of the parameter

4. Timeline

5. About Me

I am a third year undergraduate engineering student from West Bengal University of Technology, pursuing B.Tech in Computer Science and Engineering. I have been contributing to KDE for the past few months on the Qt version of GCompris.

My contributions on GCompris include:

- Display the characters attempted by the user in the Hangman activity

  https://github.com/gcompris/GCompris-qt/commit/8ab75acf49431c685021f3cd0e58cf31f3fa4568
- Adding a Directory class in Core to directly get a list of all files in a given directory

  https://github.com/gcompris/GCompris-qt/commit/955462b943c34fc130d1a68fcfb0e1ec6393a3f0

- Improve the algorithm to add new levels in the categorization activity, so that we do not need to change the code while adding new levels. Also, added odd-even category in the categorization activity

  https://github.com/gcompris/GCompris-qt/commit/db7a4a9b743a3521c7c68f0b2b54719cbc9582db

- Display a black point in drawletters and drawnumbers activity whenever a line cannot be drawn for a given input

  https://github.com/gcompris/GCompris-qt/commit/eaf8dd326dd3f5581995155739be5c72af744f92

- **Ongoing activity**: Ordering activity, which aims at arranging numbers and alphabets in it's increasing or decreasing order

  https://github.com/gcompris/GCompris-qt/pull/172

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