

# Team 2 Goofy Lights Editor

## CS-383

[www.github.com/CS383Team2/Goofy\\_Lights\\_Editor](http://www.github.com/CS383Team2/Goofy_Lights_Editor)

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# 1 About this Project

This project is a alteration of the Tower Lights Project done in previous semesters for CS 383 at the University of Idaho. The end goal of this project is to create an editor for the Goofy Glasses. Goofy glasses are a creation of the University of Idaho computer science department. Goofy glasses are normal sun glasses, with RGB LED lighting, and a transmitter to send and receive data to turn the LED's on each pair of glasses on or off, as well as change the color the glasses are currently displaying. The editor we (team 2) are creating will be able to set specific coloring patterns for all of the goofy glasses at once. The general idea behind this is to create a grid with individual squares, where each square represents a single pair of goofy glasses. The user will then be able to create frames, and make a slide show of frames, and transmit the data from the slide show to the goofy glasses to create a scene.

## 1.1 Design process

The general outline of the development process can be simplified into three basic steps. Our first order of business was to start developing back-end functionality for the use cases specified (see appendix). Secondly, we created a basic GUI template to visualize layout, and speculate where extra functionality may be needed. Lastly, our focus was placed on integrating the back-end functionality we created with the GUI to bring everything together.

## 2 Sprint 1 & 2

Preliminary Design: Start: 3/06/2017 End: 3/08/2017 Sprint 1 dates: Start: 3/23/2017 End: 4/30/2017 Sprint 2 dates: Start: 3/30/2017 End: 4/9/2017

### 2.0.1 Problems encountered

Some of the issues we have encountered as a team are presented below. Originally we created a set of global variables, that almost every function would need access to such as, row#, col#, and RGB data. This worked great for testing purposes, but has created scoping issues for future updates. We are currently working on changing all of the global variables previously mentioned into local variables. We are currently working on altering our existing functions to deal with this scope change from global to local. We also originally created a RGB type, and are now altering this to an already existing Qt RGB type called QColor. Lastly, we are currently considering data flow, and how data will be used be in our goofy lights editor, we have discussed creating some data flow diagrams to help visualize this process.

## 2.1 Figures

### 2.1.1 GUI Screenshots

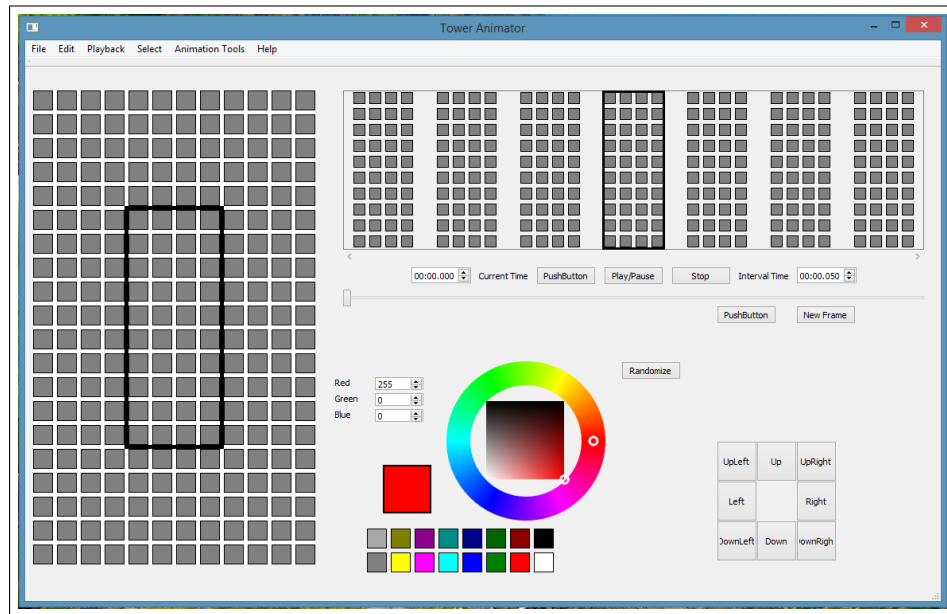


Figure 1: Original GUI design from previous tower lights project

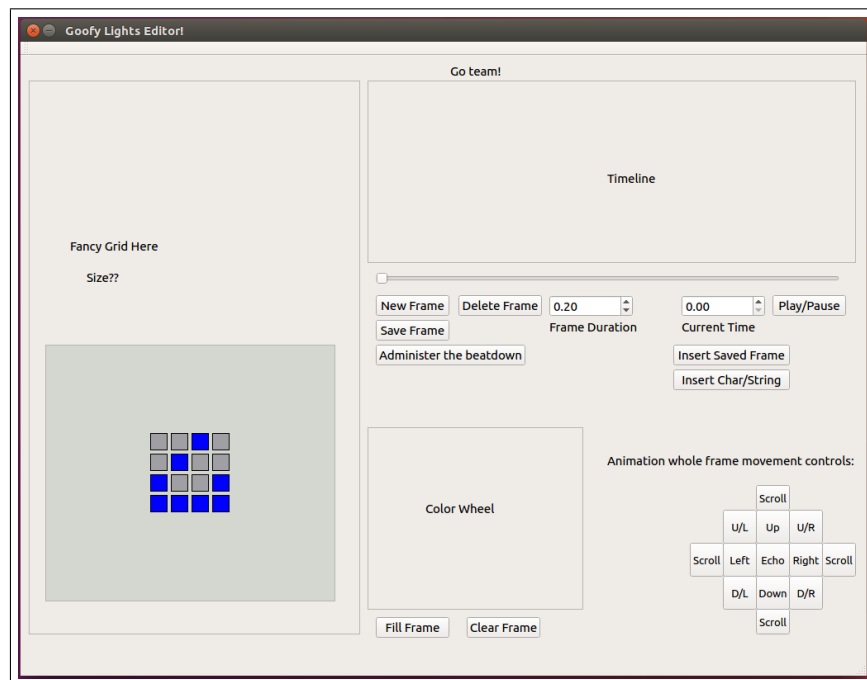


Figure 2: Our initial GUI after first sprint

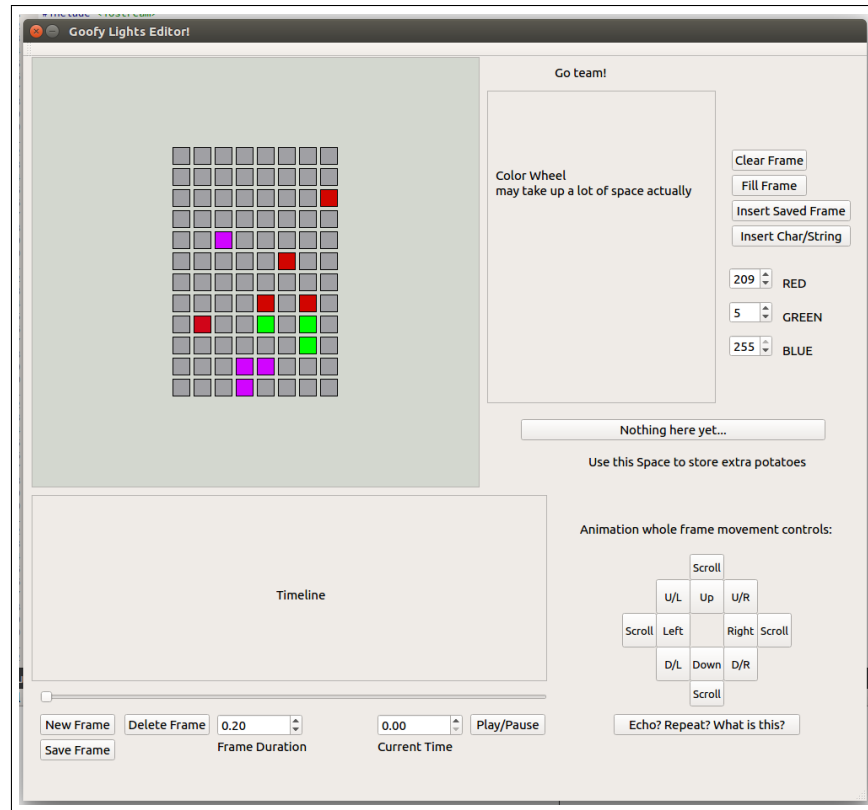


Figure 3: GUI after second sprint, RGB functionality added

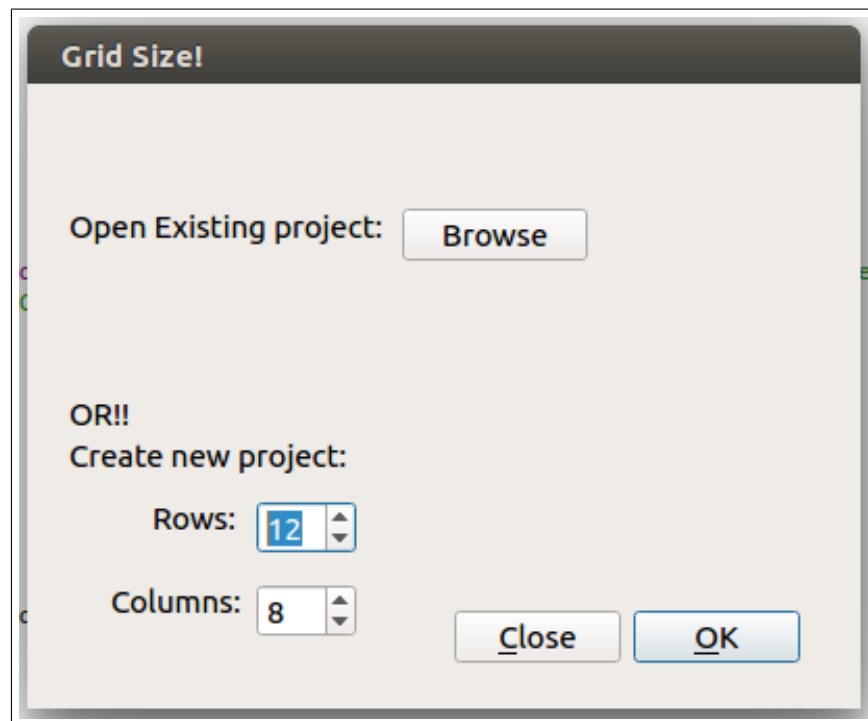


Figure 4: Grid size selection dialog added

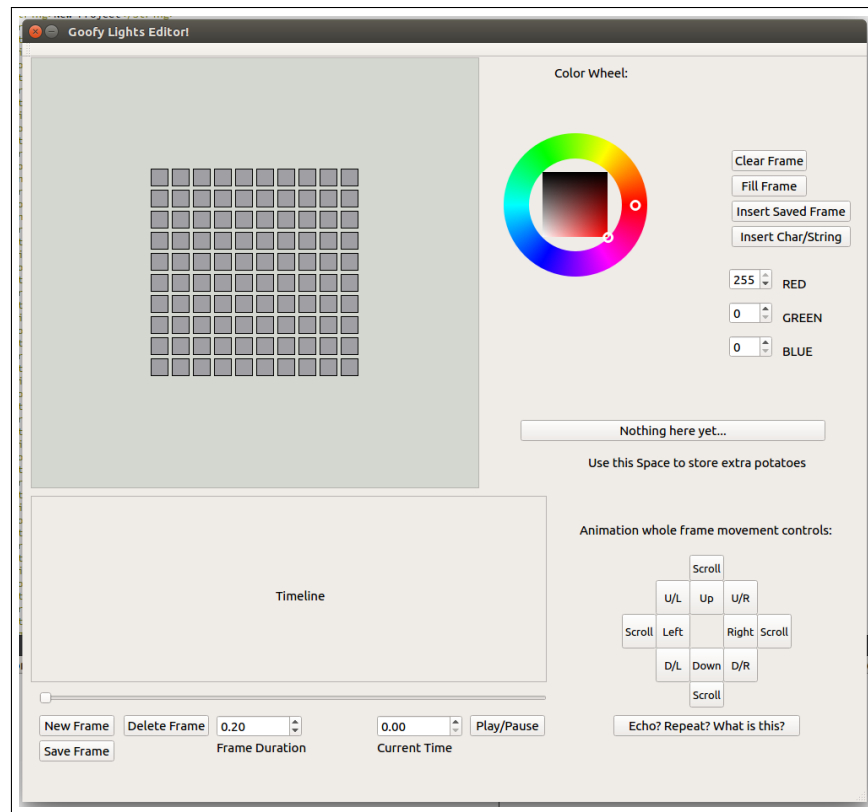


Figure 5: Color wheel added in sprint 3

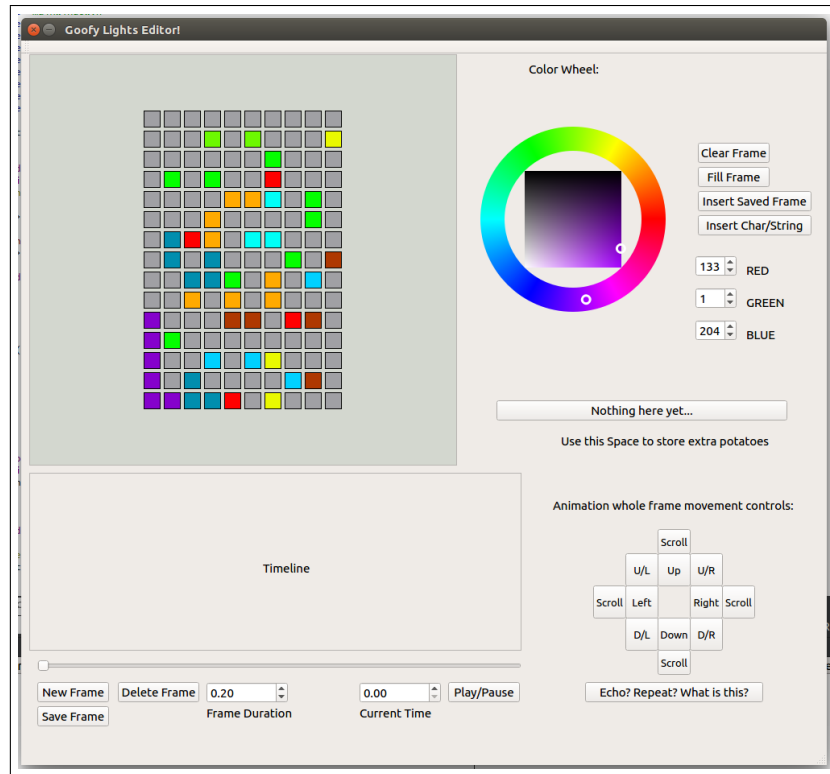


Figure 6: Color wheel demo

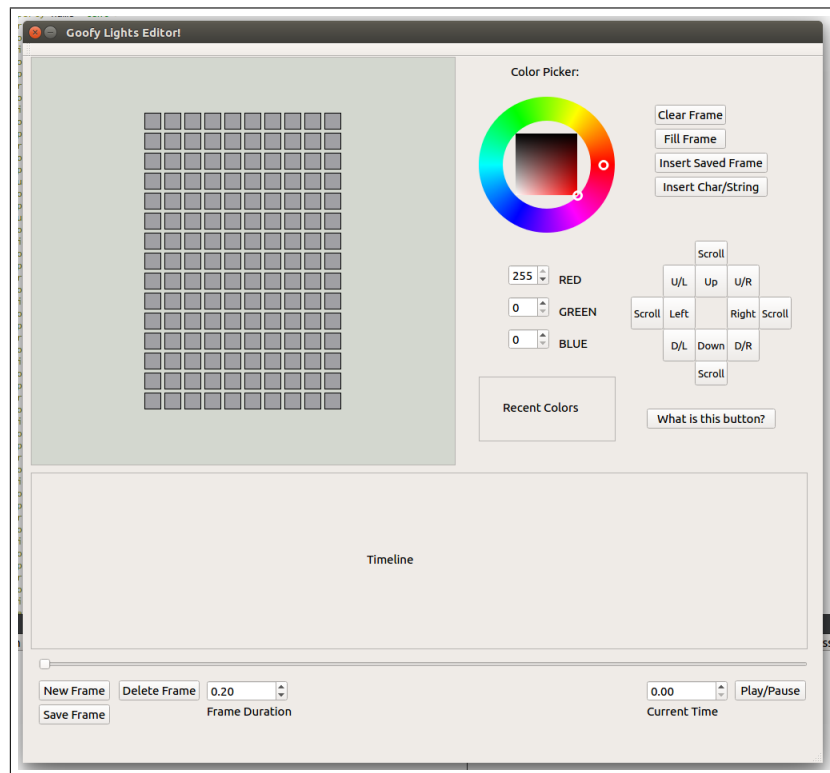


Figure 7: Control buttons moved in sprint 3

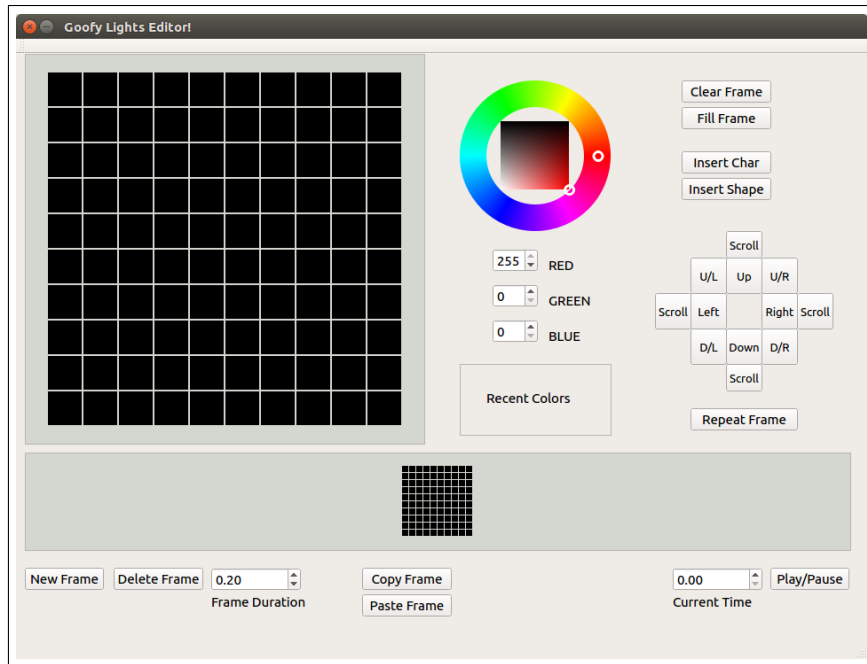


Figure 8: Timeline implemented. Default squares now black

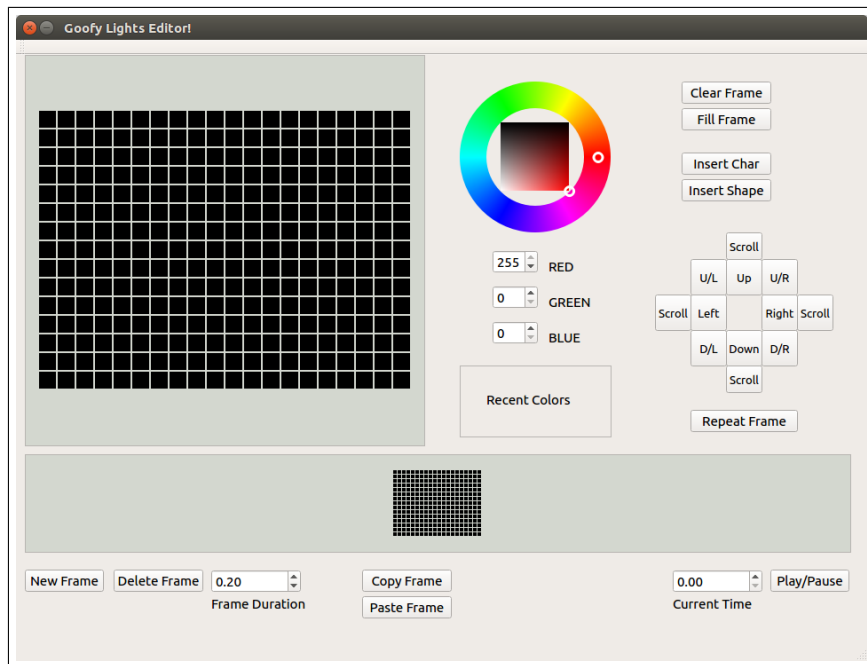


Figure 9: Grid size demo 15x20



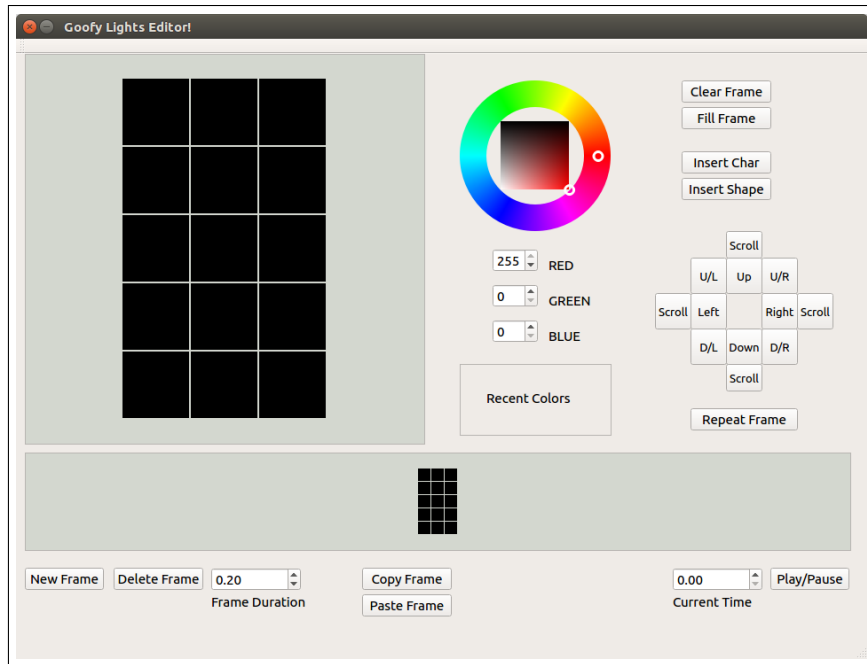


Figure 10: Grid size demo 5x3

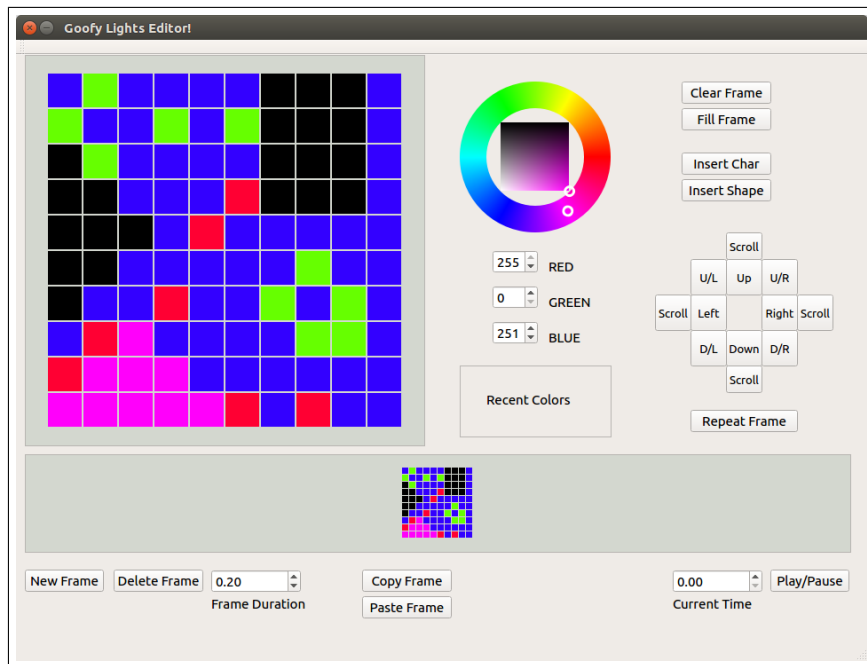


Figure 11: GUI usage demo at the end of sprint 3

## 2.1.2 UML Diagrams

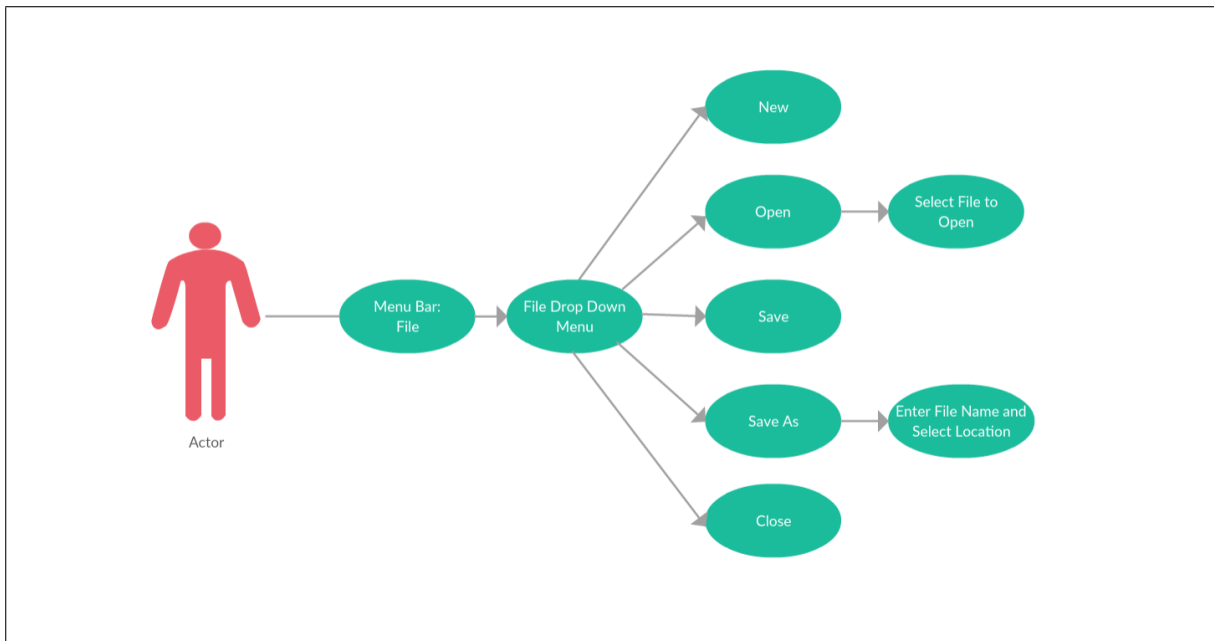


Figure 12: File manipulation

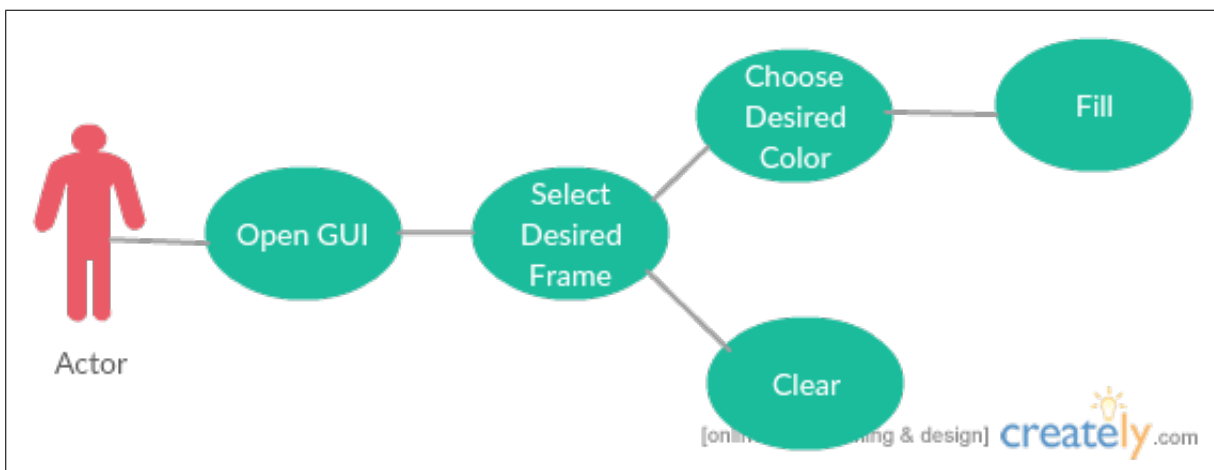


Figure 13: Fill or clear frame with current color

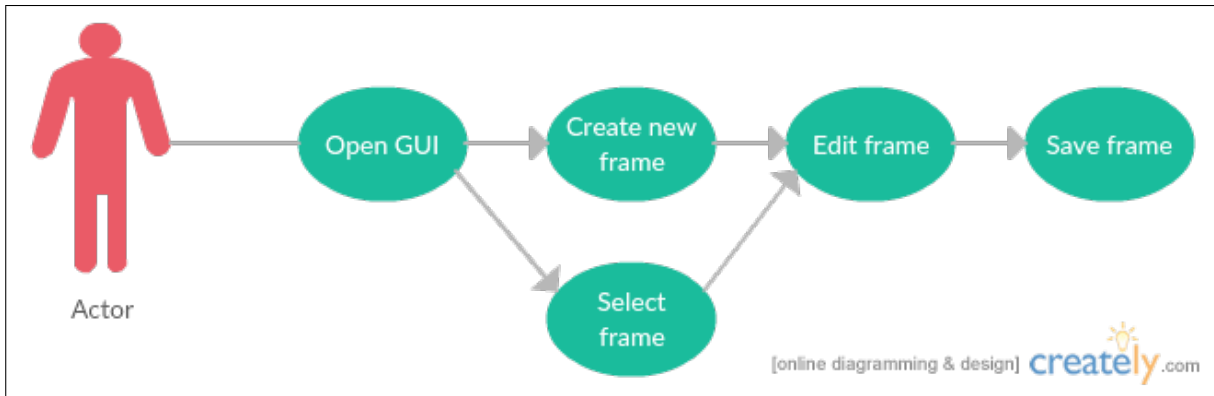


Figure 14: Save/copy current frame for re-use in animation

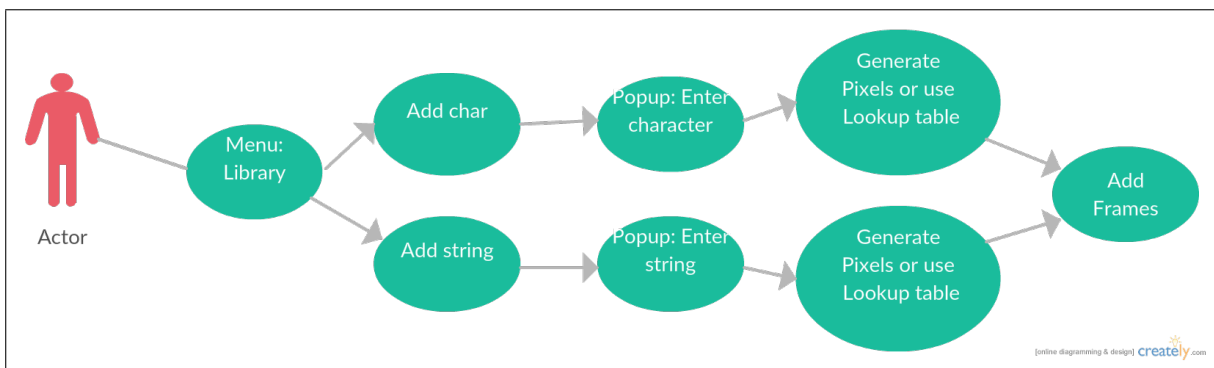


Figure 15: Add char/string from predefined set

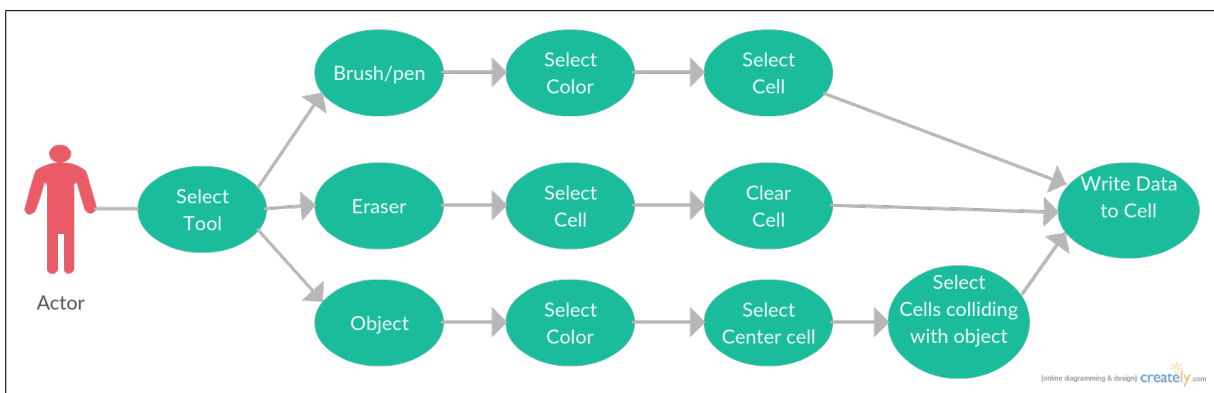


Figure 16: Add a pixel in any position in any color

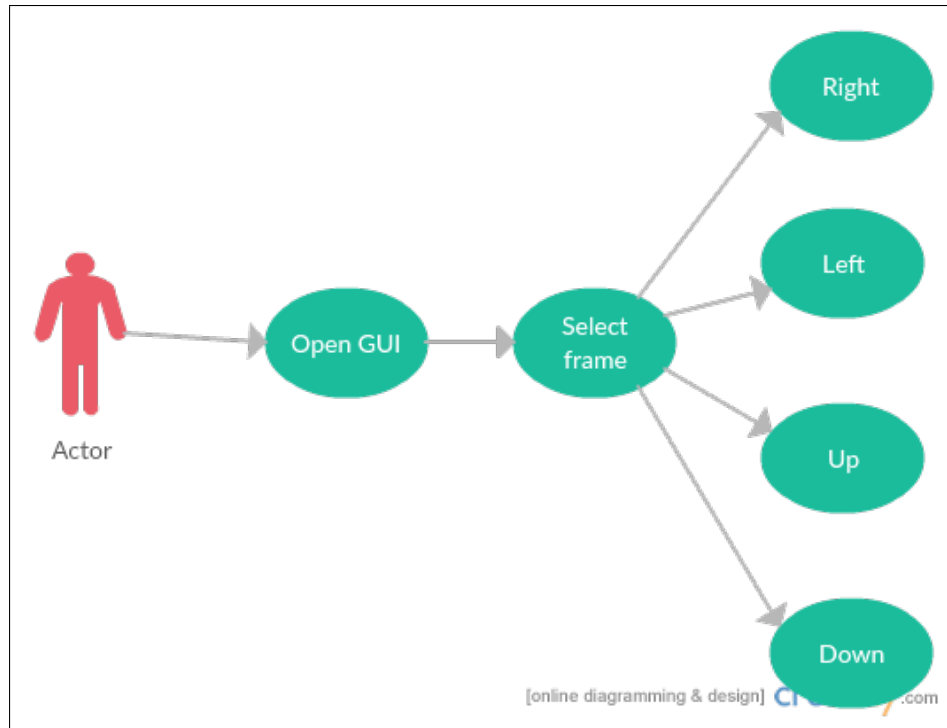


Figure 17: Move everything in frame 1 pixel in a direction

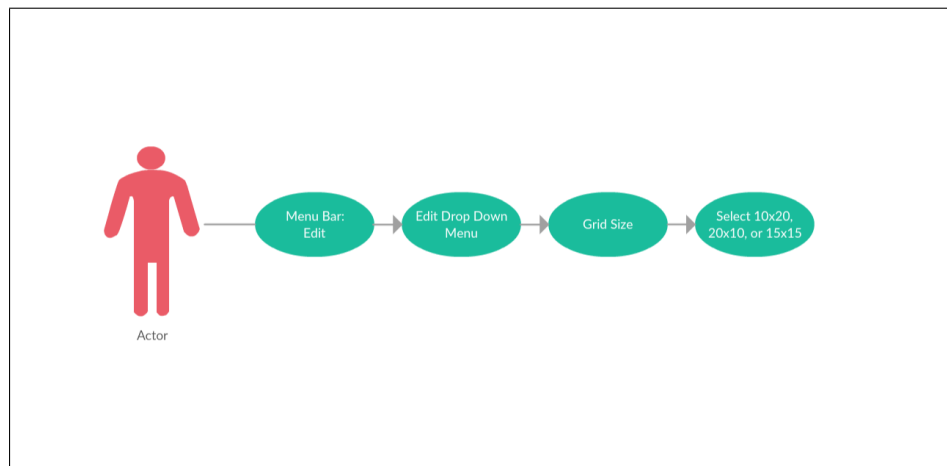


Figure 18: Choose grid size for the file

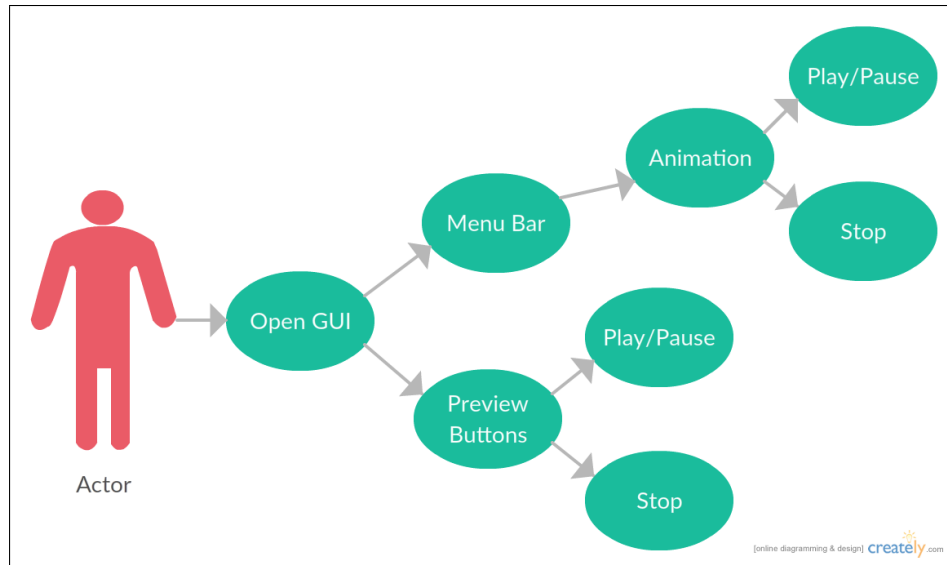


Figure 19: Preview play/pause/stop animation

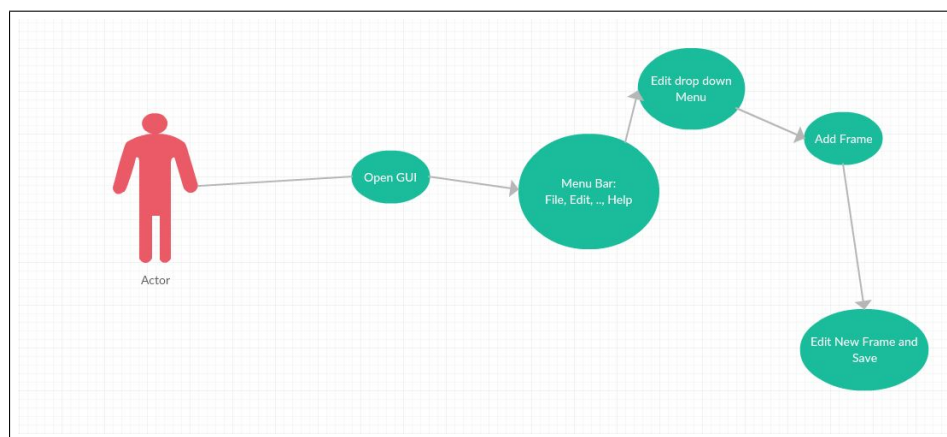


Figure 20: Create new frame

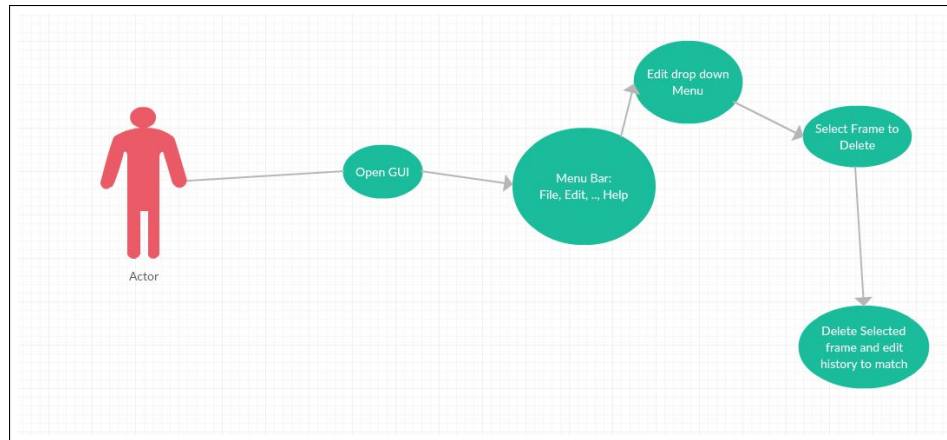


Figure 21: Delete a frame

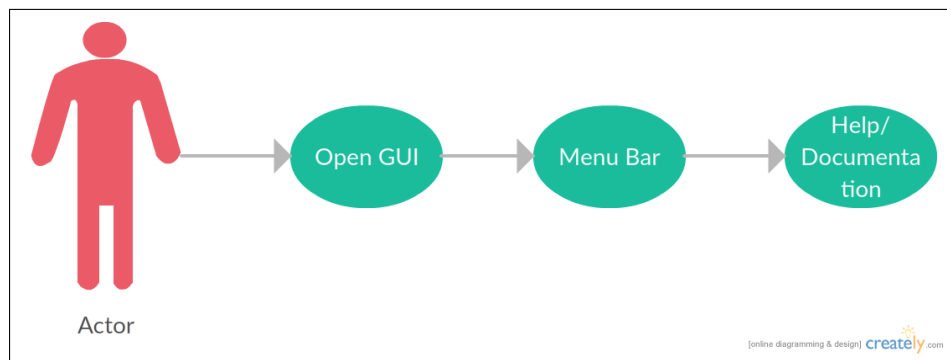


Figure 22: Open help/documentation text

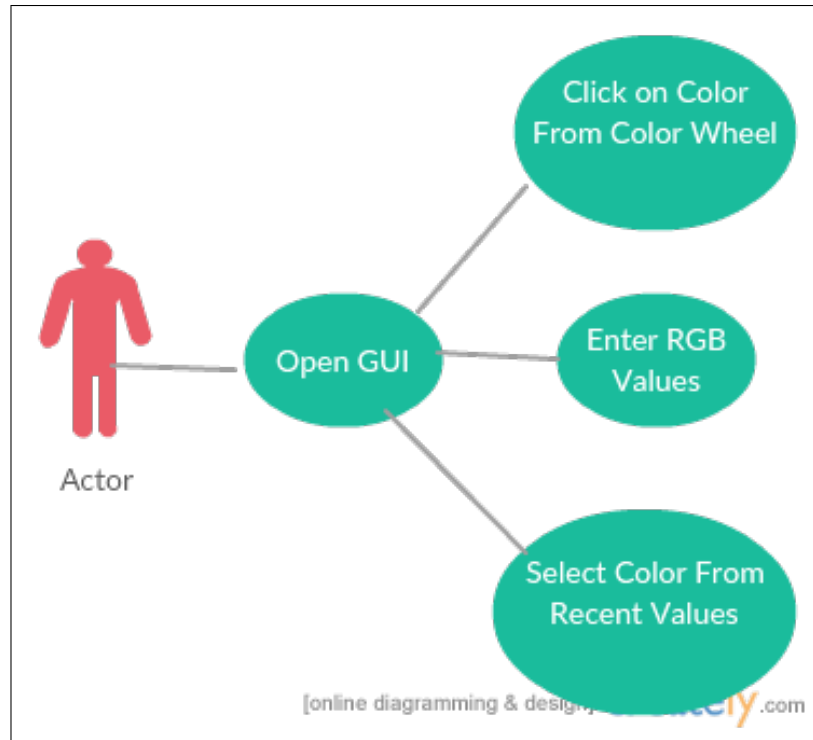


Figure 23: Chose a color on the colorwheel

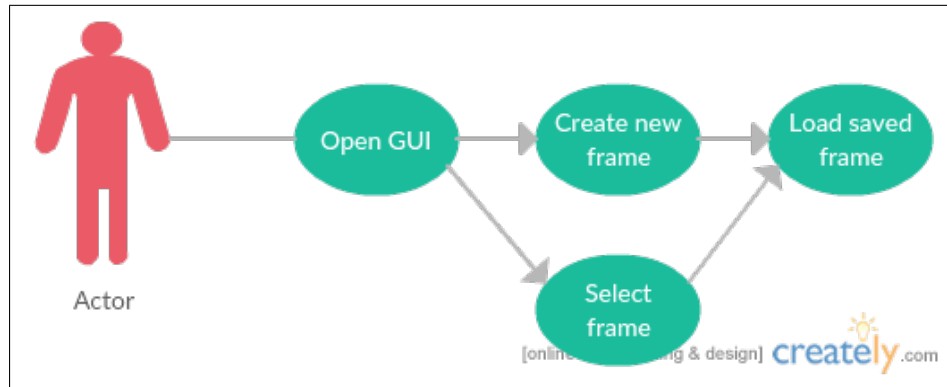


Figure 24: Insert a saved frame

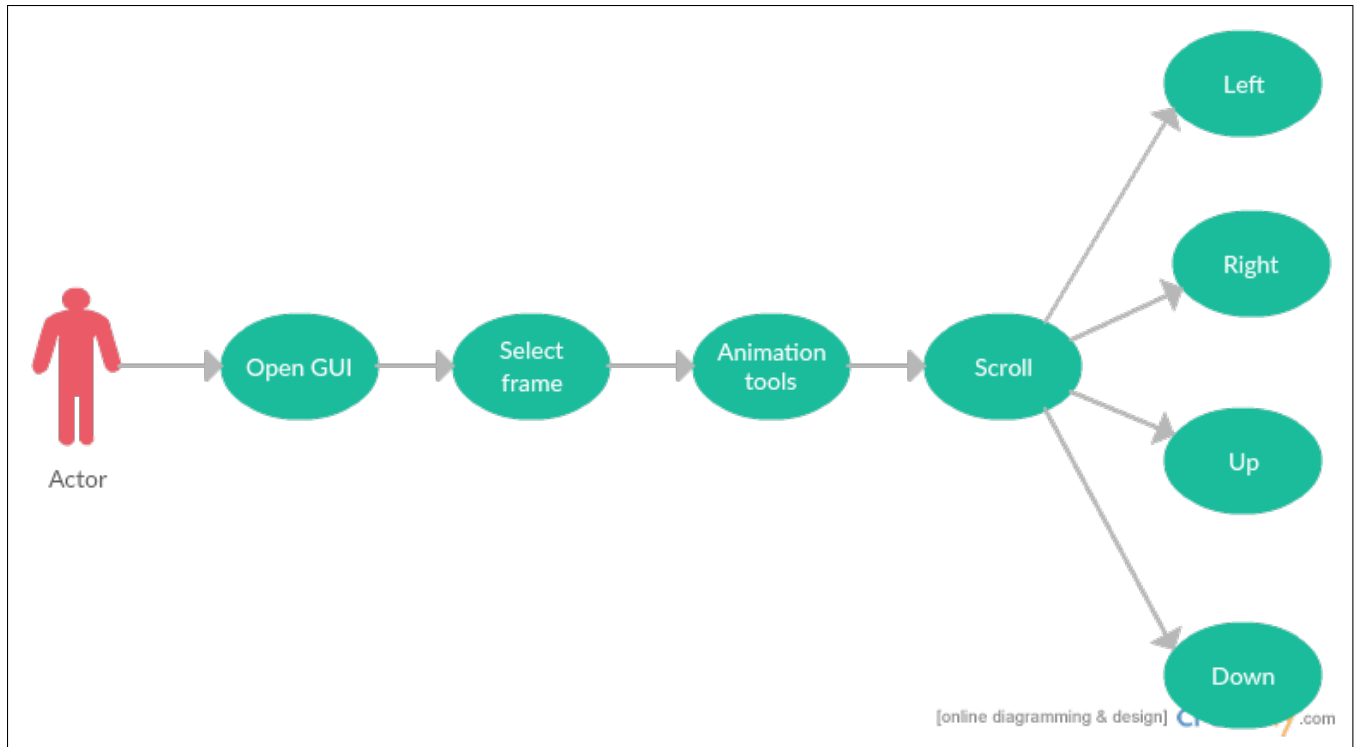


Figure 25: Scroll everything across entire frame



## 2.2 Timeline sprint 2

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Rough timeline, revision #2  
Starting March 30th (Thursday)

Week 1: (completed)

- 1) Rough out GUI
- 2) Create data structure
- 3) Start file manipulation functions
- 4) Make something to look at (pretty colors)

Week 2:

Sprint 2:

- 1) Add Row/Column data to Framedata
  - 2) Delete attached RGB structures
  - 3) Copy Framedata
  - 4) Retrieve frame x
  - 5) Fix RGB bug
  - 6) Update frame x
- //finish by TUESDAY???

Week 3:

Sprint 3:

SOLIDIFY GUI LAYOUT (buttons, sliders, sizes)  
Start filling out the functionality of buttons

Week 4:

Sprint 4:

Finish all functionality  
Add extra features  
Start final documentation

Week 5:

Final sprint??

System testing, find bugs, hopefully something works mostly  
Update UML diagrams  
Polish final documentation

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## 2.3 GitLog during sprint 2

Git log since 20170330

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```
* d8d0fcb - Nick Krenowicz, Sun Apr 9 22:33:48 2017 -0700 : Team schedule finder
* 4baa9a3 - Nick Krenowicz, Sun Apr 9 22:33:24 2017 -0700 : Master Tex Doc: Gitlog
* b9eaba8 - Kevin Dorscher, Sun Apr 9 19:55:53 2017 -0700 : Master Tex Doc & PDF Update
* cd9db6f - Kevin Dorscher, Sun Apr 9 19:29:05 2017 -0700 : Master Tex Documentation
  Changes
* 7152af0 - Kevin Dorscher, Sun Apr 9 19:23:05 2017 -0700 : Documentation Changes
* 5cf9167 - welc2421, Sun Apr 9 19:00:00 2017 -0700 : Current Color Preview
* 94e8b76 - welc2421, Sun Apr 9 18:55:30 2017 -0700 : Current Color Preview
* 7e793d2 - welc2421, Sun Apr 9 18:53:30 2017 -0700 : Current Color Preview
* 3ffd1ca - welc2421, Sun Apr 9 18:52:14 2017 -0700 : Current Color Preview
* 925b27a - welc2421, Sun Apr 9 18:51:16 2017 -0700 : Current Color Preview
* c3516b3 - Emma Bateman, Sun Apr 9 18:40:10 2017 -0700 : framedata.duration ->
  framedata.duration
* c37fc69 - YupHio, Sun Apr 9 13:59:40 2017 -0700 : Tex authors
* f6f7eac - YupHio, Sun Apr 9 13:57:10 2017 -0700 : New Tex author formatting?
* 01f7126 - YupHio, Sun Apr 9 13:46:00 2017 -0700 : Tex author formatting
* 1ade1d0 - Nick Krenowicz, Sun Apr 9 13:12:39 2017 -0700 : FrameList delete mid minor
  fix
* 7f7e37a - YupHio, Sun Apr 9 13:07:50 2017 -0700 : Tex formatting
* 1ddb136 - YupHio, Sun Apr 9 12:50:15 2017 -0700 : Formatting
* 27645e3 - YupHio, Sun Apr 9 12:36:46 2017 -0700 : Seg fault comment
* a84f36b - YupHio, Sun Apr 9 12:34:01 2017 -0700 : Added GUI screenshots to Master Tex
* 78e4838 - Tim Sonnen, Sun Apr 9 12:33:30 2017 -0700 : Merge pull request #35 from
  CS383Team2/fileio
|\
| * 8da54da - tsonnen, Sun Apr 9 12:27:08 2017 -0700 : Merge remote-tracking branch
  'origin/master' into fileio
| |\
| |/\
|/|
* | 294e6cf - YupHio, Sun Apr 9 12:11:27 2017 -0700 : Finally, static grid spacing
* | c0e9938 - YupHio, Sun Apr 9 11:45:28 2017 -0700 : Slightly better cropping
| * b43c853 - tsonnen, Sun Apr 9 12:25:24 2017 -0700 : Cleanup and test
| * f849187 - tsonnen, Sun Apr 9 11:47:58 2017 -0700 : Merge branch 'master' into fileio
| |\
| |/\
|/|
* | 90ed600 - YupHio, Sun Apr 9 10:41:45 2017 -0700 : Latest gui
* | 481358a - YupHio, Sun Apr 9 10:31:49 2017 -0700 : File management
* | b5ec046 - YupHio, Sun Apr 9 10:26:06 2017 -0700 : Historical GUI Screenshots
* | 7162833 - emmabateman, Fri Apr 7 20:38:30 2017 -0700 : Merge pull request #33 from
  CS383Team2/right/left
|\ \
| * \ 52647dd - emmabateman, Fri Apr 7 17:35:29 2017 -0700 : Merge branch 'master' into
  right/left
| |\ \
| * | | 6fc2d6a - Emma Bateman, Fri Apr 7 17:07:51 2017 -0700 : 2 color palette
* | | | 3559c14 - Nick Krenowicz, Fri Apr 7 19:52:59 2017 -0700 : FrameList: Bugfix
* | | | 530ad89 - Nick Krenowicz, Fri Apr 7 19:09:48 2017 -0700 : FrameList: Minor
  renames
```

```

* | | 11106da - Nick Krenowicz, Fri Apr 7 18:50:39 2017 -0700 : FrameList: AddNode
  Middle Update
* | | 09c4899 - Nick Krenowicz, Fri Apr 7 18:24:48 2017 -0700 : FrameList: Delete list
  update
* | | 7d683f8 - Nick Krenowicz, Fri Apr 7 17:57:17 2017 -0700 : FrameList AddTail
  update
| | / /
|/| |
* | | c9cef8a - Nick Krenowicz, Fri Apr 7 16:27:37 2017 -0700 : Doc: Cleanup doc
  directory
* | | e4cec55 - Krenowicz, Fri Apr 7 15:33:46 2017 -0700 : Doc: Added tan files and
  cleanup
* | | 8c8f713 - YupHio, Fri Apr 7 09:09:30 2017 -0700 : Fixed all ambiguous names... :)
* | | 5555462 - YupHio, Fri Apr 7 08:58:11 2017 -0700 : Fixed more widget names
* | | e8f6503 - YupHio, Fri Apr 7 08:42:57 2017 -0700 : Removed unused R and C from .h
  files
* | | 0277b8c - Nick Krenowicz, Thu Apr 6 21:36:49 2017 -0700 : Bug fix. main rc
* | | 39a1ac0 - Nick, Thu Apr 6 21:14:32 2017 -0700 : Merge pull request #31 from
  CS383Team2/Row_Col_Reworks
|\ \ \
| | / /
|/| |
| * | cfa2255 - Nick Krenowicz, Thu Apr 6 20:59:47 2017 -0700 : Removed FrameData r/c
|/ /
* | 42d162d - Nick Krenowicz, Thu Apr 6 13:02:03 2017 -0700 : Minor update & compile
* | f951c05 - Kevin Dorscher, Thu Apr 6 13:02:03 2017 -0700 : Update
  Goofy_Lights_Editor_Master_Doc.tex
* | b75e77e - Kevin Dorscher, Thu Apr 6 12:19:01 2017 -0700 : Images of the GUI design
  from sprint 1 to now
* | 62da4a0 - welc2421, Wed Apr 5 19:13:08 2017 -0700 : double click to clear single
  square
* | 70eb973 - welc2421, Wed Apr 5 19:11:42 2017 -0700 : added double click to clear a
  single square
* | 803bf5f - Nick Krenowicz, Wed Apr 5 18:21:51 2017 -0700 : Doc: Master Doc Changed
  sizes
* | 2c8240f - welc2421, Wed Apr 5 16:04:59 2017 -0700 : I corrected my name
* | 6079165 - Nick Krenowicz, Wed Apr 5 15:59:51 2017 -0700 : Doc: Master Doc added names
* | 74712c4 - Nick Krenowicz, Wed Apr 5 14:35:23 2017 -0700 : Doc: Master tex document
  filled
* | 607d92a - YupHio, Wed Apr 5 13:18:18 2017 -0700 : updateTimeline() lags by 1 click
* | 703fd32 - Nick Krenowicz, Wed Apr 5 13:15:23 2017 -0700 : Doc: Master tex document
* | 98966ac - YupHio, Wed Apr 5 12:09:49 2017 -0700 : GUI scaled to 960x700
* | 76b95ee - YupHio, Wed Apr 5 12:02:35 2017 -0700 : GUI is now 960x768
* | 42dd1b5 - YupHio, Wed Apr 5 10:02:45 2017 -0700 : AUTO-MAGICALLY SCALED GRID! :)
* | 90928cd - YupHio, Wed Apr 5 10:02:11 2017 -0700 : Dialogs for help and doc...
* | 1b9acac - Nick Krenowicz, Wed Apr 5 00:27:13 2017 -0700 : UI Widget Name Changes 4
* | beffff6 - Nick Krenowicz, Wed Apr 5 00:18:52 2017 -0700 : UI Widget Name Changes 3
* | 8a344d1 - Nick Krenowicz, Tue Apr 4 23:57:52 2017 -0700 : UI Widget Name Changes 2
* | e24185f - Nick Krenowicz, Tue Apr 4 23:29:47 2017 -0700 : UI Widget Name Changes
* | 7fd3274 - YupHio, Tue Apr 4 11:35:47 2017 -0700 : Timeline is coming along.
* | 6d48c0c - YupHio, Tue Apr 4 11:23:56 2017 -0700 : Timeline alpha sucks, will work
  soon.
* | 3c43a53 - YupHio, Tue Apr 4 11:23:14 2017 -0700 : TIMELINE is coming soon...
* | 34a9472 - YupHio, Tue Apr 4 11:00:55 2017 -0700 : Actually fixed gridToFrameData

```

```

    segfault
* | cdc50e - welc2421, Tue Apr 4 10:46:07 2017 -0700 : Update Function Round 2
* | 6fff940 - welc2421, Mon Apr 3 22:32:08 2017 -0700 : Added Update Node Functio
* | 1f132d4 - welc2421, Mon Apr 3 22:30:15 2017 -0700 : Added the Update Node Function
* | 62652ba - Nick Krenowicz, Mon Apr 3 22:28:07 2017 -0700 : mainwindow: FrameData
    cleanup
* | 55e9388 - Nick Krenowicz, Mon Apr 3 22:08:31 2017 -0700 : mainwindow: changed r/c
    vars to global G_Row/G_Col
| * 3e14b43 - tsonnen, Mon Apr 3 20:29:42 2017 -0700 : Update load interface. TESTED.
    Frame ID changes when returning back to calling function.
| * ebf7541 - tsonnen, Mon Apr 3 19:38:38 2017 -0700 : Change load file interface
    UNTESTED
|/
* 69f9fae - YupHio, Mon Apr 3 16:01:46 2017 -0700 : Seg Fault "fixed" for R<C
* 75bcc84 - YupHio, Mon Apr 3 15:57:49 2017 -0700 : Push
* ca11db9 - YupHio, Mon Apr 3 15:57:35 2017 -0700 : Help->Documentation dialog created
* b7402ac - YupHio, Mon Apr 3 15:49:03 2017 -0700 : Fixed Fill Frame bug. -P
* 5da2547 - YupHio, Mon Apr 3 00:33:18 2017 -0700 : Slightly looser grid to fix bugs
* 195cfce - YupHio, Mon Apr 3 00:19:37 2017 -0700 : Grid is tight as a drum. NoPen.
* d9d1e23 - YupHio, Sun Apr 2 22:49:29 2017 -0700 : Coding from my cellphone. Working?
* 56ede99 - YupHio, Sun Apr 2 17:54:47 2017 -0700 : FrameDataToGrid stitched in
* e603769 - YupHio, Sun Apr 2 17:42:50 2017 -0700 : Clear Frame stitched to FrameData
* ef64526 - YupHio, Sun Apr 2 17:40:09 2017 -0700 : Stitched a FrameData to the GUI grid
    -P
* 829a0d6 - Nick Krenowicz, Sun Apr 2 17:13:45 2017 -0700 : Cleanup: Removed github
    issues comments from files
* 8304bc7 - Tim Sonnen, Sun Apr 2 16:57:44 2017 -0700 : Merge pull request #20 from
    CS383Team2/fileio
| \
| * 4278d3b - tsonnen, Sun Apr 2 16:00:25 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileio
| | \
| * | 04426cd - tsonnen, Sun Apr 2 15:51:51 2017 -0700 : Changed nullptr to NULL as
    nullptr was not compiling.
| * | 9cb3648 - tsonnen, Sun Apr 2 15:44:30 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileio
| | \ \
| * \ \ 1fbe861 - tsonnen, Sun Apr 2 15:34:29 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileio. Fix FileOperations.cpp error. Commits 38185e0 and
    aa76ef0 somehow overwrote the previous changes.
| | \ \ \
| * | | 1dadec6 - tsonnen, Sun Apr 2 15:25:44 2017 -0700 : Fix overwrite issue. Check
    commit 38185e0
| * | | 656c2ac - Nick Krenowicz, Sun Apr 2 16:45:40 2017 -0700 : Merge
    remote-tracking branch 'origin/master'
| \ \ \ \ \
| * | | | 4ef6c77 - YupHio, Sun Apr 2 16:41:28 2017 -0700 : Comment clarity/ Fill Frame
* | | | 214b4ad - Nick Krenowicz, Sun Apr 2 16:45:08 2017 -0700 : Merge branch
    'copyFrame'
| \ \ \ \ \
| | / / / /
| / | | | |
| * | | | 2e6a099 - Nick Krenowicz, Sun Apr 2 16:24:33 2017 -0700 : copyFrame()
    finalized

```

```

| * | | | | f3739f0 - Nick Krenowicz, Sun Apr 2 16:13:49 2017 -0700 : Fixed pointer
    error and changed copyFrame interface
| * | | | | ca0b44c - Nick Krenowicz, Sun Apr 2 14:53:55 2017 -0700 : Changed copyFrame
    Interface
| * | | | | cfa7db6 - Nick Krenowicz, Sun Apr 2 14:19:34 2017 -0700 : CopyFrame() done
| * | | | | 0f4efa3 - Nick Krenowicz, Sun Apr 2 14:14:10 2017 -0700 : copyFrame row/col
    variables renamed
| * | | | | 1309aad - Nick Krenowicz, Sun Apr 2 14:05:34 2017 -0700 : Moved
    frames.DeleteList Before "Program end" output
| * | | | | 5effc69 - Nick Krenowicz, Sun Apr 2 14:04:34 2017 -0700 : Minor edits to
    FrameList.cpp
* | | | | 525f51f - YupHio, Sun Apr 2 16:37:02 2017 -0700 : Removed ALPHA from all
    code -P
* | | | | ff8cf26 - YupHio, Sun Apr 2 16:26:56 2017 -0700 : Clear Frame is now BLACK
* | | | | 11a1c47 - YupHio, Sun Apr 2 16:21:09 2017 -0700 : copyFrame fixed with error
    checking
* | | | | c196b24 - YupHio, Sun Apr 2 16:14:18 2017 -0700 : copyFrame coded and not
    tested :)
* | | | | fef1693 - YupHio, Sun Apr 2 16:01:03 2017 -0700 : Fill Frame and Clear Frame
    work great
| | _|_|_|/
|/| | | |
* | | | | 2b615f8 - YupHio, Sun Apr 2 15:49:06 2017 -0700 : SmartGit works right?
* | | | | 83e7221 - YupHio, Sun Apr 2 15:47:35 2017 -0700 : Fill Frame+Clear Frame
    buttons work on GUI side
| | _|_|_|/
|/| | | |
* | | | 3b6db45 - YupHio, Sun Apr 2 15:29:05 2017 -0700 : Clarification
| | _|_|_|/
|/| | | |
* | | 87c35d9 - YupHio, Sun Apr 2 15:26:14 2017 -0700 : Testing SmartGit
* | | f6069d4 - Nick Krenowicz, Sun Apr 2 15:10:17 2017 -0700 : Merge pull request #19
    from CS383Team2/fileio
* | | 952ee9d - Tim Sonnen, Sun Apr 2 14:28:23 2017 -0700 : Merge pull request #19 from
    CS383Team2/fileio
|\ \ \ \
| | | | /
| | | | /
| * | 8fec6eb - tsonnen, Sun Apr 2 14:16:07 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileio
|/ /
* | 1448ab3 - YupHio, Sun Apr 2 14:13:56 2017 -0700 : GUI Version 3.0 -P
* | 617bf2d - Nick, Sun Apr 2 14:09:04 2017 -0700 : Merge pull request #16 from
    CS383Team2/Delete_RGB
|\ \
| | | /
|/|
| * 621e903 - Nick Krenowicz, Sun Apr 2 13:38:45 2017 -0700 : Merge branch 'master'
    into Delete_RGB
| |\
| | /
|/|
* | b6139f3 - YupHio, Sun Apr 2 13:12:27 2017 -0700 : Colorwheel linked to spinboxes
    (sorta)(difficult)

```

```

* | 6a3e519 - YupHio, Sun Apr 2 11:54:26 2017 -0700 : The color wheel, IT'S ALIVE!
* | 83f0ba3 - YupHio, Sun Apr 2 11:18:35 2017 -0700 : What is a color wheel? Oh.
* | 9bea306 - YupHio, Fri Mar 31 15:00:10 2017 -0700 : Full RGB support! Woohoo
* | 7059410 - YupHio, Fri Mar 31 14:52:25 2017 -0700 : GridSquares now support RGB,
    ooooo -P
* | 4463f47 - YupHio, Fri Mar 31 14:15:44 2017 -0700 : *another* dialog to browse for
    existing .tan file
* | 9a1fcd0 - YupHio, Fri Mar 31 14:00:54 2017 -0700 : May want to open an existing file?
* | 3700fb1 - YupHio, Fri Mar 31 13:55:39 2017 -0700 : Existing project dialog update
* | abb520a - YupHio, Fri Mar 31 13:15:47 2017 -0700 : Better grid size dialog
* | 78cd88f - YupHio, Fri Mar 31 13:02:26 2017 -0700 : Grid size dialog!
* | 5f6a9da - YupHio, Fri Mar 31 12:19:27 2017 -0700 : Added grid size popup dialog.
    +extern G_ROW, G_COL
/
* 99b16dd - Nick Krenowicz, Fri Mar 31 00:56:25 2017 -0700 : Update comments for
    main.cpp test code
* 0827459 - Nick Krenowicz, Fri Mar 31 00:48:45 2017 -0700 : Added delete_RGB to
    FrameList delete methods
* 19d0eba - Nick Krenowicz, Fri Mar 31 00:27:19 2017 -0700 : Merge branch 'master' into
    Delete_RGB

```

---

## 3 Sprint 3

Sprint 3 dates: Start: 4/11/2017 End: 4/19/2017

### 3.1 Work done and problems encountered

For this sprint in our Goofy Lights Editor we covered a lot of needed basic functionality additions, as well as resolved some issues we created with sprint 2. The summary of these changes can be found below. The main additions our group added to the Goofy Lights Editor in sprint 3, were mostly related to the changes in scope of our variables from local to global, and adding our time line to the GUI.

Paul did most of the work for the addition of the time line, and its functionality. After we had a working timeline, we added extra functionality to some of the pre-existing buttons we already had displayed in our GUI. This allowed us to test our new time line multiple times for correctness. We did run into a small issue with figuring out how to go about adding and updating the timeline frames to match the grid that is currently being edited.

A few of our team members set up a "code review" for some needed clarification on some of the GUI functions, as well as discussed how to fix the small issue with the time line mentioned above. The only other major issue we ran into this sprint, that was carried over from sprint 2, was scoping changes. We changed a lot of our local variables that were being used in multiple functions to a global scope for ease of access.

### 3.2 Timeline sprint 3

Our time line for sprint 3 has almost stayed the same since the last sprint. Original sprint 3 time line: Solidify GUI Layout (buttons, sliders, sizes, ect.)

Updated Sprint 3 time line:

- Recent Color Palette
- Alter adding to the time line (linked list)
- Integration of existing code into GUI

### 3.3 Sprint 3 figures

#### 3.3.1 GUI Screenshots

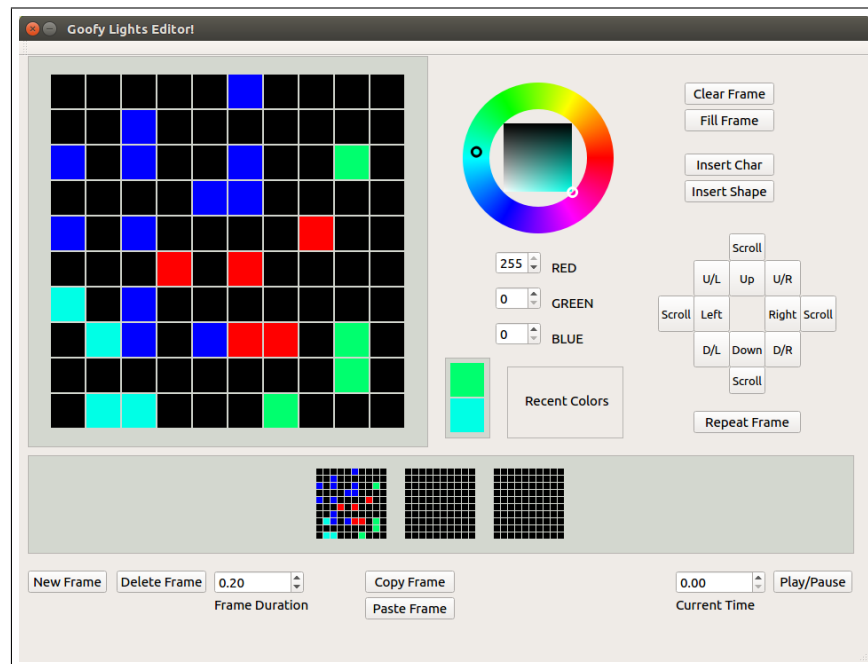


Figure 26: GUI Layout, beginning of sprint 3

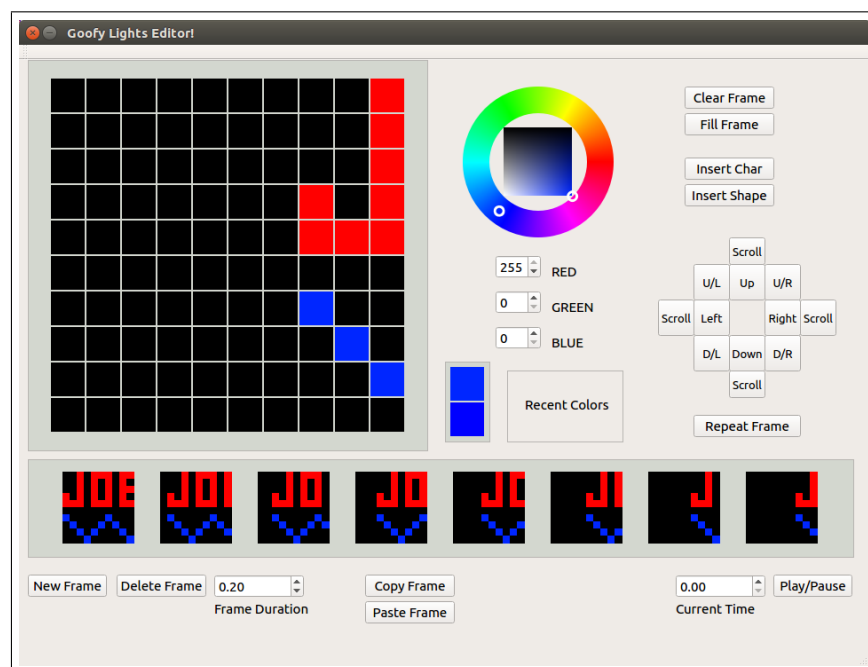


Figure 27: GUI Translate Frame



### 3.4 GitLog during sprint 3

Git log since April 11th, 2017

---

```
* 3f07ea4 - gjcarter, Wed Apr 19 18:04:30 2017 -0700 : Updated fill frame and clear
  frame buttons to use our fillFrame function.
* 506097b - gjcarter, Wed Apr 19 18:02:15 2017 -0700 : Updated fillFrame functions to
  use pointers for FrameData.
* a82a18c - YupHio, Wed Apr 19 17:58:57 2017 -0700 : Playback basically works
* 7b5b8c8 - Kevin Dorscher, Wed Apr 19 16:13:29 2017 -0700 : Merge remote-tracking
  branch 'origin/master' into Time-Line-Position-Rework
|\
| * 5442687 - YupHio, Wed Apr 19 15:08:41 2017 -0700 : Player window started (button
  works)
* | c07c5a7 - Kevin Dorscher, Wed Apr 19 16:12:58 2017 -0700 : Updated Time Line
  Positions to be its own function.
|/
* a81257a - YupHio, Wed Apr 19 14:21:28 2017 -0700 : Red Square works
* 1cc170e - YupHio, Wed Apr 19 13:21:35 2017 -0700 : Red Square started
* d4de72a - Nick Krenowicz, Tue Apr 18 20:51:12 2017 -0700 : Review Notes
* 93abdce - Nick Krenowicz, Tue Apr 18 18:30:31 2017 -0700 : Quick optimize of
  create_RGB with framenummer. Removed loop and combined with current loop.
* 05faa4d - gjcarter, Tue Apr 18 17:25:23 2017 -0700 : Fixed translateFrame to take a
  pointer as an argument. Also cleaned up other translate button functions to match
  the cleaner version.
* 8fcc12b - Kevin Dorscher, Tue Apr 18 15:51:10 2017 -0700 : Time Line Position Update
* c48ff0e - Nick Krenowicz, Tue Apr 18 14:41:38 2017 -0700 : Master doc update
* 19fb068 - Nick Krenowicz, Tue Apr 18 09:52:59 2017 -0700 : Draw grid for first node at
  program start
* c648588 - YupHio, Tue Apr 18 09:34:53 2017 -0700 : Ooops, click lose bug still there
* 462ad1e - YupHio, Tue Apr 18 09:04:34 2017 -0700 : Fixed bug where fill frame gets
  lost in a click
* dc2be91 - YupHio, Tue Apr 18 09:00:20 2017 -0700 : Play button
* 55f66da - YupHio, Tue Apr 18 08:26:53 2017 -0700 : Play window started
* 8fb1794 - Nick Krenowicz, Mon Apr 17 23:58:00 2017 -0700 : Translate rework 2 &
  copyFrame update
* 267299c - Nick Krenowicz, Mon Apr 17 21:39:47 2017 -0700 : Translate Rework
* 4c64aae - Nick Krenowicz, Mon Apr 17 16:52:59 2017 -0700 : More of the same
* 44a2c1b - Nick Krenowicz, Mon Apr 17 16:30:10 2017 -0700 : Mainwindow consistancy work
* bebdb05 - Nick Krenowicz, Mon Apr 17 16:07:19 2017 -0700 : Mainwindow retrieveframe
  rework
* 9464924 - YupHio, Mon Apr 17 11:47:41 2017 -0700 : Delete Frame still needs some work
* d5d235f - YupHio, Mon Apr 17 11:40:25 2017 -0700 : Repeat Frame button implemented
* ad0b81b - Tim Sonnen, Mon Apr 17 01:27:48 2017 -0700 : Merge pull request #40 from
  CS383Team2/fileSegFaultFix
|\
| * ef2a9a8 - tsonnen, Mon Apr 17 01:16:34 2017 -0700 : Merge remote-tracking branch
  'origin/master' into fileSegFaultFix
| |\
| |/\
|/|
* | aeacfa7 - Nick Krenowicz, Mon Apr 17 00:03:06 2017 -0700 : Mainwindow cleanup &
  rework
* | 9cb4f2f - Kevin Dorscher, Mon Apr 17 00:02:17 2017 -0700 : More GUI Screenshots from
```

```

    sprint 3
* | 9740eaf - Nick Krenowicz, Sun Apr 16 21:42:07 2017 -0700 : main cleanup & removed
    test code
* | f9f507d - Kevin Dorscher, Sun Apr 16 20:25:26 2017 -0700 : GUI_3_2_04-16-2017
* | abed582 - Nick Krenowicz, Sun Apr 16 20:08:01 2017 -0700 : Merge branch
    'Doc_MasterDoc_Rework'
|\ \
| * | bcba9d8 - Kevin Dorscher, Sun Apr 16 20:06:07 2017 -0700 : Sprint 3 Info added to
    master doc
| /
* | b07f7be - Emma Bateman, Sun Apr 16 19:21:07 2017 -0700 : Merge remote-tracking
    branch 'origin/master'
|\ \
| * | ddbel13 - YupHio, Sun Apr 16 18:44:31 2017 -0700 : All translate buttons work
| * | 0892c7e - YupHio, Sun Apr 16 18:36:02 2017 -0700 : Translate Right button now
    works :)
* | | 48a5fb7 - Emma Bateman, Sun Apr 16 19:13:24 2017 -0700 : timelineFrameNumer ->
    timelineFrameNumber
* | | 1059107 - Emma Bateman, Sun Apr 16 18:40:04 2017 -0700 : frame duration
|/ /
| * 97ef48f - tsonnen, Sun Apr 16 13:56:55 2017 -0700 : Integrate save/load
| * 0e97eb4 - tsonnen, Sun Apr 16 13:14:35 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileSegFaultFix
| |\
| | /
|/|
* | 87dbf9e - YupHio, Sun Apr 16 12:55:49 2017 -0700 : Fixed merge error
* | 9732e31 - YupHio, Sun Apr 16 12:52:11 2017 -0700 : Merge pull request #38 from
    CS383Team2/MultiFrameReview
|\ \
| * \ 45c0c7d - YupHio, Sun Apr 16 12:51:56 2017 -0700 : Merge branch 'master' into
    MultiFrameReview
| |\ \
| | / /
|/| |
* | | 6356d8c - YupHio, Sat Apr 15 07:09:11 2017 -0700 : Timeline frame spacing fixed
* | | a07ba44 - Emma Bateman, Sat Apr 15 00:46:06 2017 -0700 : start with first frame on
    grid
| * | 2d0aea7 - YupHio, Sun Apr 16 12:35:46 2017 -0700 : Start with zero frames and no
    grid
| * | 59976d7 - YupHio, Sun Apr 16 12:28:31 2017 -0700 : New Frame updates timeline,
    fixes lost click
| * | 37c5f2f - YupHio, Sun Apr 16 11:34:16 2017 -0700 : Delete Frame button does NOT
    work yet
| * | d31dacb - YupHio, Sun Apr 16 11:26:42 2017 -0700 : Delete Node button almost sorta
    works
| * | fefc90c - YupHio, Sun Apr 16 11:10:08 2017 -0700 : Fixed a FillFrame/ClearFrame bug
| * | e8753bb - YupHio, Sun Apr 16 11:00:03 2017 -0700 : New Frame button makes current
    frame the new frame
| * | 5aba45b - YupHio, Sun Apr 16 10:54:18 2017 -0700 : New Frame button implemented :)
|/ /
* | 9d346b0 - Nick Krenowicz, Fri Apr 14 19:00:56 2017 -0700 : Merge branch 'master'
    into MultiFrameReview
|\ \

```

```

| * | cdbf74e - tsonnen, Fri Apr 14 02:34:12 2017 -0700 : Add availability
| * | b6a59fd - gjcarter, Wed Apr 12 22:34:17 2017 -0700 : Updated availability
| * | 091779f - Kevin Dorscher, Wed Apr 12 19:55:21 2017 -0700 : Updated Team Schedule
    (Kevin)
| * | 2e82c1f - Emma Bateman, Wed Apr 12 18:37:46 2017 -0700 : schedule
| * | 176f3a5 - welc2421, Wed Apr 12 12:27:56 2017 -0700 : Add files via upload
| /
* | 516c1ba - Nick Krenowicz, Fri Apr 14 18:54:54 2017 -0700 : Fixed test code to not
    segfault with grid size under 10.
* | dcbac29 - YupHio, Fri Apr 14 16:52:21 2017 -0700 : You can now select which frame to
    edit
* | c5e7c01 - YupHio, Fri Apr 14 15:12:29 2017 -0700 : 10
* | c88d205 - YupHio, Fri Apr 14 15:11:32 2017 -0700 : corner to corner cool
* | b07bfef - YupHio, Fri Apr 14 15:10:18 2017 -0700 : Timeline Scroll demo
* | d3c859f - YupHio, Fri Apr 14 15:08:18 2017 -0700 : Solved object uniqueness problem
* | a250a04 - Nick Krenowicz, Fri Apr 14 13:27:41 2017 -0700 : Mainwindow: MultiFrame
    Review
* | 660efdb - YupHio, Fri Apr 14 12:41:32 2017 -0700 : Cleaned
* | 5f507b4 - YupHio, Fri Apr 14 12:01:50 2017 -0700 : Comment clarity and pretty test
    colors
* | db25304 - YupHio, Fri Apr 14 11:16:21 2017 -0700 : finally more than one frame
* | 344f2b8 - YupHio, Fri Apr 14 11:14:22 2017 -0700 : Fixed palette and 3rd frame
* | 3451bc9 - YupHio, Fri Apr 14 11:02:04 2017 -0700 : 2 frames on timeline, finally.
* | c9585eb - Nick Krenowicz, Fri Apr 14 10:44:09 2017 -0700 : FraemFrameList: Retrieve
    frame fix 2
* | 0c3818f - Nick Krenowicz, Fri Apr 14 10:40:08 2017 -0700 : FrameList: Retrieve frame
    fix
| * | a6ec5d7 - tsonnen, Fri Apr 14 03:09:39 2017 -0700 : Load file seg fault fix
| /
* | eb5a78a - Nick Krenowicz, Thu Apr 13 22:57:32 2017 -0700 : Mainwindow: temp FrameData
    variable rename
* | 95e51a1 - gjcarter, Thu Apr 13 22:08:43 2017 -0700 : Fillframe and fillframe2
    corrected to use QColor variables.
* | e1fa64a - Nick Krenowicz, Thu Apr 13 22:02:33 2017 -0700 : Return Code update
* | 625f94f - Nick Krenowicz, Thu Apr 13 21:53:40 2017 -0700 : First Frame
* | 57a2496 - Nick Krenowicz, Thu Apr 13 21:36:22 2017 -0700 : MainWindow Cleanup
* | 2f0ca2a - Nick Krenowicz, Thu Apr 13 13:44:13 2017 -0700 : FrameList Added methods to
    update internal row,col
* | 5cc9f7e - Nick Krenowicz, Thu Apr 13 13:26:31 2017 -0700 : Reverted: Removed blank
    FrameList constructor
* | 7cf5fac - Nick Krenowicz, Thu Apr 13 13:06:35 2017 -0700 : Merge branch
    'Implementing-square-objects-into-FrameData' into Implementing/FrameList_Advancement
| \
| * | 171d1a8 - YupHio, Thu Apr 13 12:52:59 2017 -0700 : Multiple frames in timeline. Send
    help.
| * | 649c423 - YupHio, Thu Apr 13 12:21:37 2017 -0700 : Timelinegrid now accessed through
    linked list
| * | 618f857 - YupHio, Thu Apr 13 11:11:35 2017 -0700 : Swapped ROW and COL in objects
| * | ec68d6e - YupHio, Thu Apr 13 11:01:04 2017 -0700 : Deleted ALL global variables :)
| * | 6052727 - gjcarter, Wed Apr 12 23:48:40 2017 -0700 : Changed global row and columns
    throughout code to match new global struct. Commented out some FileIO code as it was
    causing some seg faults and isn't currently working with the changes.
| * | c761a19 - gjcarter, Wed Apr 12 22:24:16 2017 -0700 : Added global structure
    containing global row and columns, left and right palette colors, and framelist

```

```
    pointer.  
* | 7dd46f8 - Nick Krenowicz, Tue Apr 11 22:52:53 2017 -0700 : FileOp: advancement fix &  
    pointer debugging  
* | 02d356b - Nick Krenowicz, Tue Apr 11 20:41:02 2017 -0700 : FrameList Advance upgrade  
|/  
* 9eb43c0 - Nick Krenowicz, Tue Apr 11 19:56:55 2017 -0700 : Removed blank FrameList  
    constructor  
* cdb33bc - Nick Krenowicz, Tue Apr 11 19:54:37 2017 -0700 : Merge branch 'master' into  
    Implementing-square-objects-into-FrameData
```

---

## 4 Sprint 4

Sprint 4 dates: Start: 4/20/2017 End: 4/??/2017

### 4.1 Work done and problems encountered

Stuff

### 4.2 Timeline sprint 4

Stuff

Updated Sprint 4 time line:

- thing

### 4.3 Sprint 4 figures

#### 4.3.1 GUI Screenshots

Figure 28: GUI Layout, beginning of sprint 4

Figure 29: GUI Layout, beginning of sprint 4

#### 4.3.2 UML Diagrams

Figure 30: UML

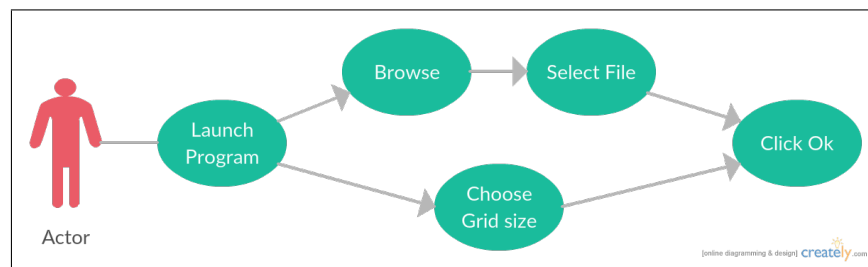


Figure 31: UML Program Start

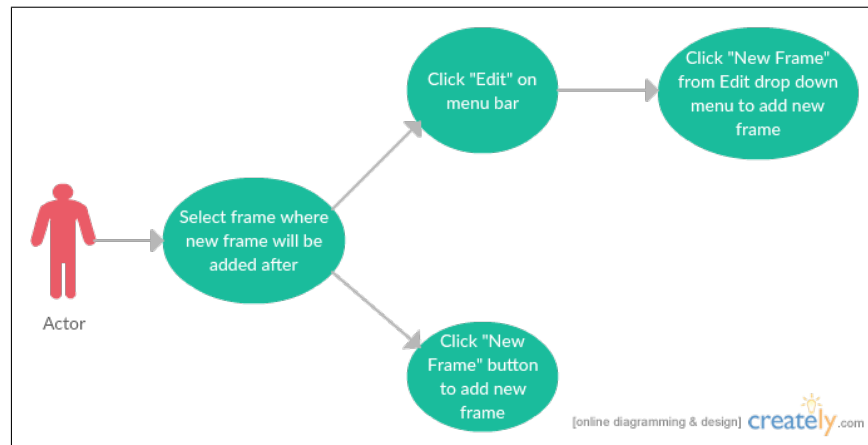


Figure 32: UML New Frame

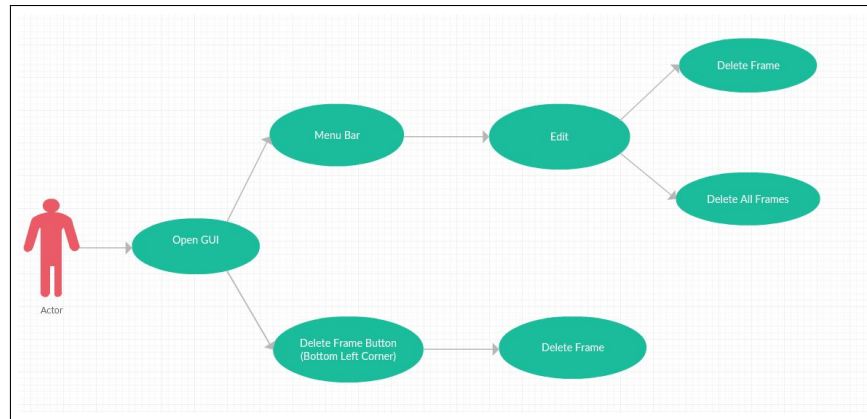


Figure 33: UML Delete Frame

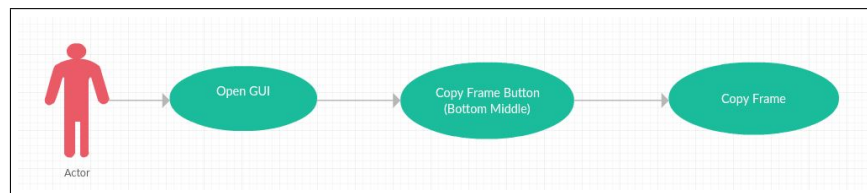


Figure 34: UML Copy Frame

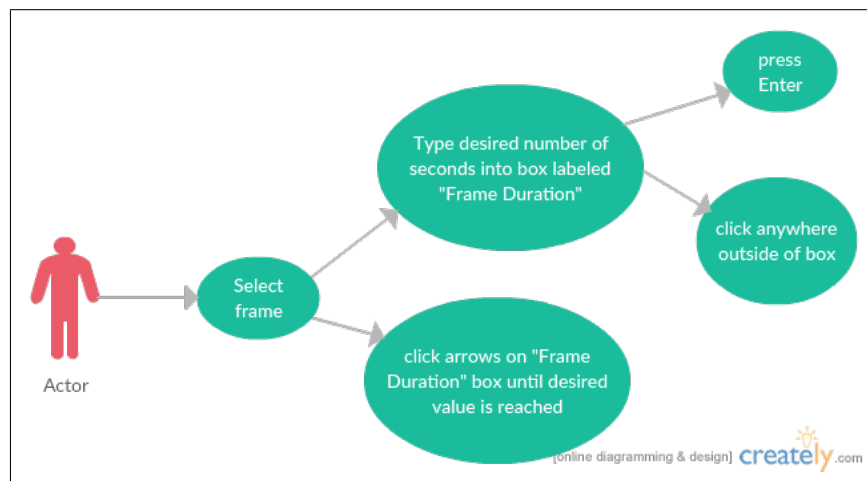


Figure 35: UML Change Frame Duration

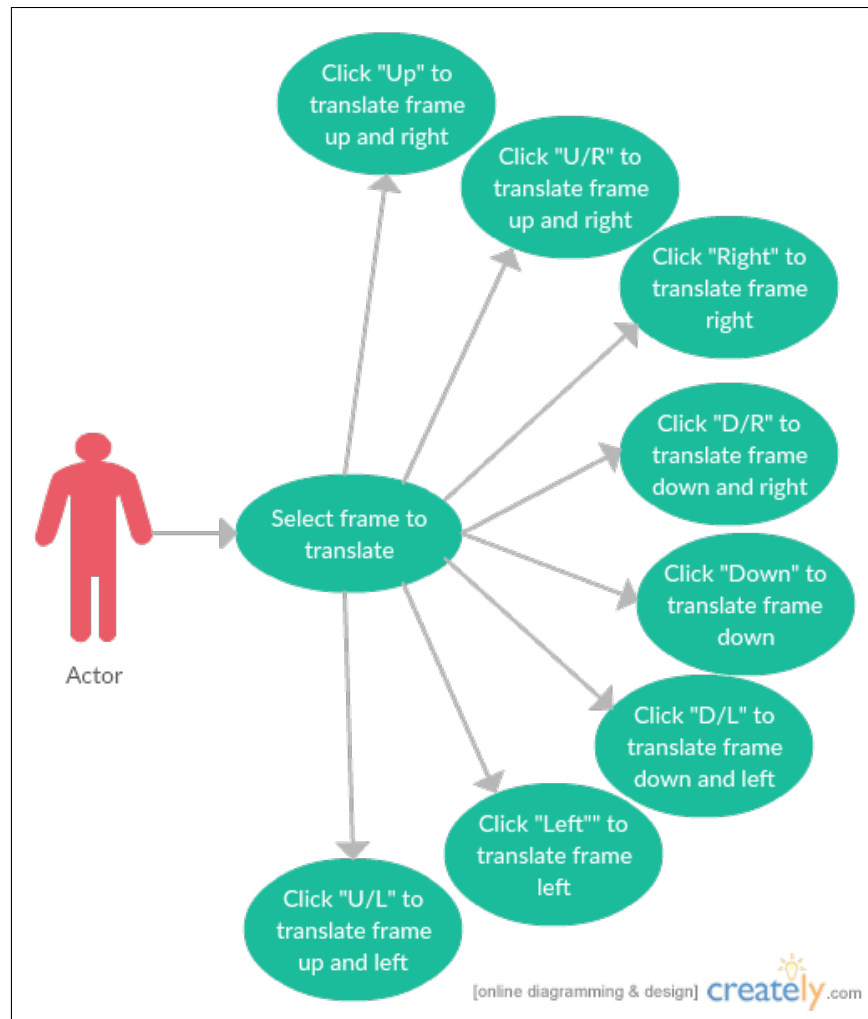


Figure 36: UML Translate Frame

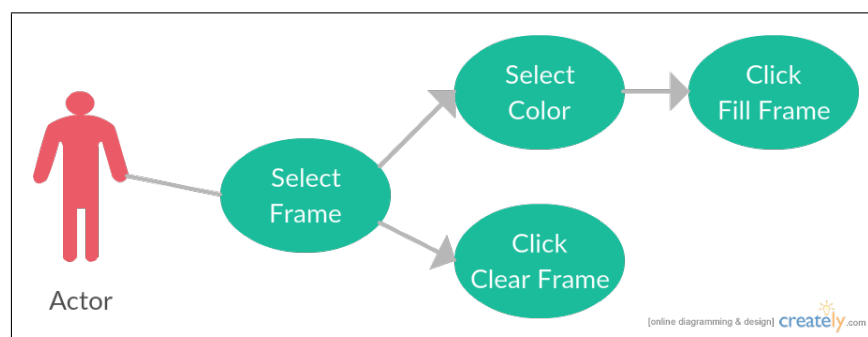


Figure 37: UML Fill/Clear Frame



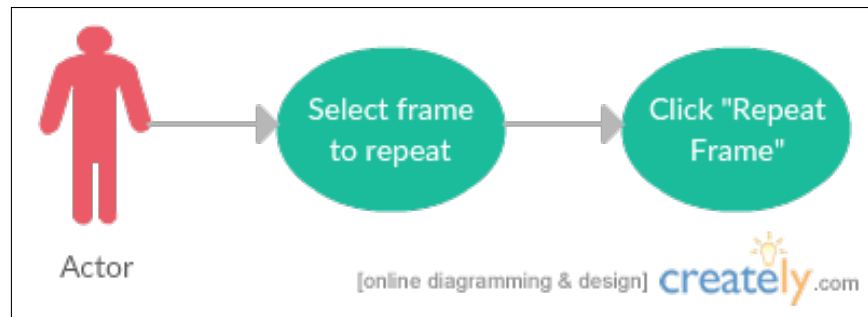


Figure 38: UML Repeat Frame

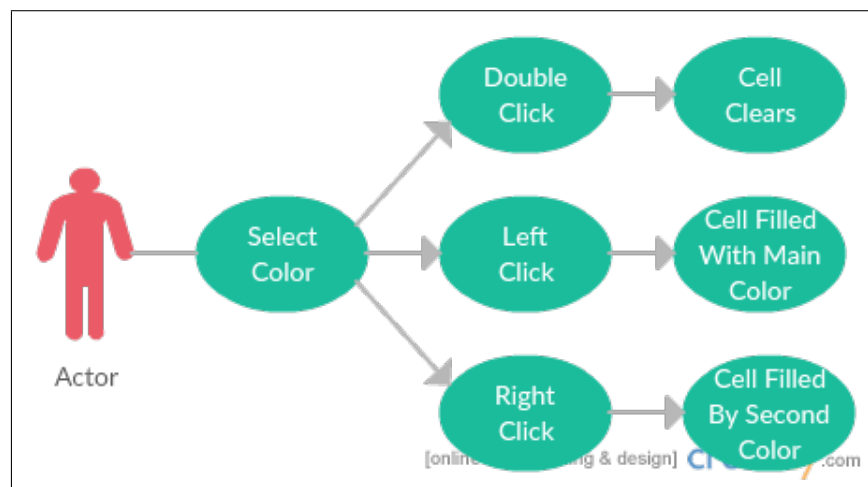


Figure 39: UML Add Pixel

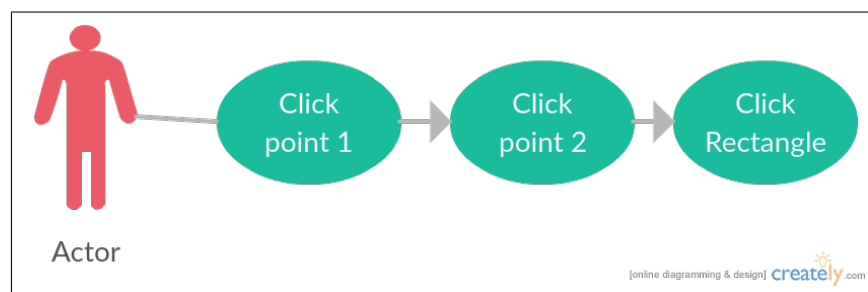


Figure 40: UML Draw Rectangle

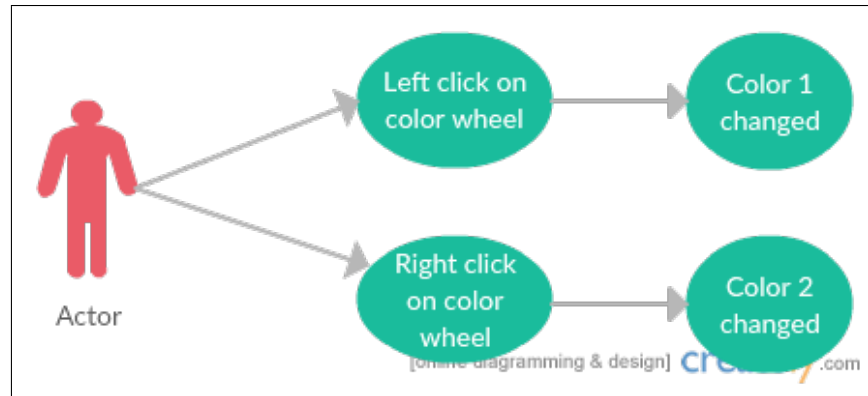


Figure 41: UML Change Colors

## 4.4 GitLog during sprint 4

Git log since April 20th, 2017

---

```
* b38498e - Nick, Tue May 9 12:40:19 2017 -0700 : Update README.md
* cc61973 - YupHio, Tue May 9 08:27:31 2017 -0700 : Text was being cut-off in dialog box
  on my machine, I fixed the size.
* 5a67cb5 - Nick Krenowicz, Mon May 8 20:26:05 2017 -0700 : Fix mainGrid not loading a
  grid on file open
* b0ec0e1 - Nick Krenowicz, Mon May 8 20:21:05 2017 -0700 : SaveAs append .tan if not
  specified
* 1b05211 - gjcarter, Mon May 8 20:01:18 2017 -0700 : Fixed a few grammatical errors.
* b629c5f - Nick Krenowicz, Mon May 8 19:48:25 2017 -0700 : save code condense minor fix
* 31a2b36 - Nick Krenowicz, Mon May 8 19:42:31 2017 -0700 : save code condence
* d8a02e7 - Nick Krenowicz, Mon May 8 19:36:24 2017 -0700 : Fix sizeDialog bug
* 35997bf - Nick Krenowicz, Mon May 8 19:18:51 2017 -0700 : Fixed memory error in
  gridsquarewrapper. Fixed call operation in mainwindow
* 71d392e - gjcarter, Mon May 8 19:08:10 2017 -0700 : Fixed a few sizing issues.
* 8bab2b8 - gjcarter, Mon May 8 19:00:06 2017 -0700 : Adding links to UML use case
  diagrams to documentation window.
* d58978a - gjcarter, Mon May 8 18:34:33 2017 -0700 : Some more cleanup. Added some very
  basic info to about menu with link to our GitHub. Changed around sizing window a
  little bit to look a little more pretty.
* df74b2f - Nick Krenowicz, Mon May 8 18:34:10 2017 -0700 : Diagrams 0-10 added to
  master doc
* 21acdc6 - Nick Krenowicz, Mon May 8 18:14:29 2017 -0700 : Doc: gitlog + header files +
  1st 3 diagrams Added gitlog (update later for last few commits) Added header files
  to the document Linked first 3 UseCase files
* 399dad0 - Nick Krenowicz, Mon May 8 17:55:02 2017 -0700 : Added my Diagrams. Removed
  spaces in other filenames
* 979ea2d - gjcarter, Mon May 8 17:34:20 2017 -0700 : Added some comments for various
  functions in header files. Cleaned up some code that was not used and cleaned up
  unneeded comments.
* 116018c - Nick Krenowicz, Mon May 8 17:27:18 2017 -0700 : Moved UML cases back & minor
  renaming
* a2f50fd - Joe, Mon May 8 15:18:58 2017 -0700 : repeat_frame, translate_frame, and
  new_frame use case diagrams
* a2ffba7 - YupHio, Mon May 8 15:13:00 2017 -0700 : Play Animation Use Case
* 0976d7f - YupHio, Mon May 8 15:06:14 2017 -0700 : Add Pixel Use Case
* 9b7c490 - YupHio, Mon May 8 14:58:57 2017 -0700 : Documentation use case
* cef2407 - Emma Bateman, Mon May 8 13:50:44 2017 -0700 : 2 new use cases, and old use
  cases moved to separate folder
* 5fc8b9e - welc2421, Mon May 8 11:34:05 2017 -0700 : New UML Diagrams
* 6b2243a - welc2421, Mon May 8 11:04:36 2017 -0700 : Fixed palette bugs
* e0a2167 - Kevin Dorscher, Mon May 8 10:55:06 2017 -0700 : Delete Frame and Copy Frame
  Final UML Diagrams
* 3ef0925 - tsonnen, Mon May 8 00:37:47 2017 -0700 : Add new UML diagrams
* 321a508 - emmabateman, Sun May 7 22:46:42 2017 -0700 : Merge pull request #48 from
  CS383Team2/fileLoadFix
|\
| * c8c41cb - tsonnen, Sun May 7 17:29:45 2017 -0700 : Fixed save and load issues
| * 3e0152b - tsonnen, Sun May 7 17:01:40 2017 -0700 : Fix load in the middle
* | 6d2dd91 - Emma Bateman, Sun May 7 15:52:19 2017 -0700 : deleted some commented-out
  code
```

```

* | 6fe932e - Emma Bateman, Sun May 7 15:47:43 2017 -0700 : open existing file fix
|/
* 8dd174c - Emma Bateman, Wed May 3 17:34:30 2017 -0700 : save file fix
* b491734 - tsonnen, Tue May 2 19:47:20 2017 -0700 : Re-add Fileio. Force c++11
* a6bb22d - YupHio, Mon May 1 12:01:22 2017 -0700 : Fixed one click lag of Draw Rect
* 4af0730 - Nick Krenowicz, Mon May 1 10:03:40 2017 -0700 : Merge branch 'Draw_Line'
|\
| * 870de59 - Nick Krenowicz, Mon May 1 09:58:30 2017 -0700 : Removed DrawLine. DrawRect
  covers use case
| * 776a454 - Nick Krenowicz, Mon May 1 09:51:42 2017 -0700 : Fixed stupid error mixed
  up c and r directions
| * 7359eb5 - Nick Krenowicz, Mon May 1 01:23:00 2017 -0700 : UI rearranged.
| * 3d8fc23 - Nick Krenowicz, Mon May 1 01:13:48 2017 -0700 : Feature: DrawLine. Slight
  WIP
| * 7f14baa - Nick Krenowicz, Mon May 1 00:37:34 2017 -0700 : Feature: DrawLine
|/
* 2800aa8 - Emma Bateman, Sun Apr 30 12:20:30 2017 -0700 : removed unused "insert char"
  and "insert shape" options
* fe69711 - Emma Bateman, Sun Apr 30 11:34:56 2017 -0700 : save button
* 7bfae05 - Nick Krenowicz, Sun Apr 30 11:28:42 2017 -0700 : Merge branch
  'new-delete-function_emma'
|\
| * da0fb74 - Nick Krenowicz, Sun Apr 30 11:18:29 2017 -0700 : Currentframe behavior
  change after delete Removed old commented code
| * 4f58736 - YupHio, Sun Apr 30 11:07:04 2017 -0700 : It works
| * 1d569dc - Emma Bateman, Sat Apr 29 12:34:57 2017 -0700 : Delete Fix
* | 2bfa2de - YupHio, Sun Apr 30 10:45:09 2017 -0700 : Friendly file dialog.
|/
* 393a0fd - Emma Bateman, Thu Apr 27 23:25:27 2017 -0700 : current time box
* 1b49b93 - welc2421, Thu Apr 27 22:50:50 2017 -0700 : Deleted un-needed function
* 41998cf - gjcarter, Thu Apr 27 22:34:49 2017 -0700 : Fixed small error in
  on_btn_NewFrame_clicked for translateFrame case.
* 08105f4 - gjcarter, Thu Apr 27 22:21:34 2017 -0700 : Did some cleanup relating to the
  addition of the new newFrameHandler function. Fixed add 100 frames. Changed some
  code for consistency.
* 6743d78 - gjcarter, Thu Apr 27 21:56:18 2017 -0700 : Added a majority of the drawing
  of the timeline, refreshing of the grid, etc. into a function. Translate frame now
  shows correctly on the timeline with this change.
* 472480f - Emma Bateman, Thu Apr 27 19:56:43 2017 -0700 : frame duration fix & current
  time box
* d05f3a6 - welc2421, Wed Apr 26 22:45:22 2017 -0700 : Fixed palette lag and made it so
  only colors on the grid appear in recent colors
* b3c8fb2 - Tim Sonnen, Wed Apr 26 19:30:27 2017 -0700 : Merge pull request #46 from
  CS383Team2/fileioInteg
|\
| * 459a3d3 - Tim Sonnen, Wed Apr 26 18:40:32 2017 -0700 : Merge branch 'master' into
  fileioInteg
| |\
| |/\
|/|
* | ed3ad86 - Nick Krenowicz, Wed Apr 26 18:15:47 2017 -0700 : Player segfault fix
| * fcc1d6a - tsonnen, Wed Apr 26 17:44:16 2017 -0700 : Merge remote-tracking branch
  'origin/master' into fileioInteg
| |\

```

```

| | /
| / |
* | f94e3b5 - Nick Krenowicz, Wed Apr 26 16:44:53 2017 -0700 : gridsquareWrapper Now
  deletes allocated memory
* | e5b7bd5 - Nick Krenowicz, Wed Apr 26 16:25:25 2017 -0700 : Merge branch 'master'
  into gridclassWrapper
| \ \
* | | 4a8830c - Nick Krenowicz, Tue Apr 25 19:18:01 2017 -0700 : Fixed mainGrid update
  call, Reworked paste function
* | | 3a70076 - Nick Krenowicz, Tue Apr 25 19:09:43 2017 -0700 : Merge branch 'master'
  into gridclassWrapper
| \ \ \
* | | | 51f417e - Nick Krenowicz, Tue Apr 25 18:57:54 2017 -0700 : gridsquareWrapper
  cleanup
* | | | 81312f4 - Nick Krenowicz, Mon Apr 24 23:11:30 2017 -0700 : Cleaned up #includes
* | | | 3c795cc - Nick Krenowicz, Mon Apr 24 11:27:30 2017 -0700 : gridsquareWrapper
  integration
* | | | 3d2237f - Nick Krenowicz, Mon Apr 24 11:11:05 2017 -0700 : Created gridsquare
  wrapper class
| | | * d426999 - tsonnen, Wed Apr 26 17:06:27 2017 -0700 : Merge remote-tracking
  branch 'origin/master' into fileioInteg
| | | | \
| | | | /
| | | | /
| | * | 9cad758 - Nick Krenowicz, Wed Apr 26 15:54:58 2017 -0700 : up and down
  translation fix (reverted from commit dfae731e9695e40e83174ea79008ab9b799863cc)
| | * | 2a1950a - gjcarter, Wed Apr 26 14:54:23 2017 -0700 : Merge remote-tracking
  branch 'origin/Delete-Frame-Button'
| | | \ \
| | | * \ df33b60 - gjcarter, Tue Apr 25 21:58:24 2017 -0700 : Merge remote-tracking
  branch 'origin/Delete-Frame-Button' into delete_frame
| | | | \ \
| | | | * | 8bad13f - Kevin Dorscher, Sun Apr 23 21:14:52 2017 -0700 : Delete Frame
  WORKS!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
| | | | * | 26cc54a - Kevin Dorscher, Sun Apr 23 19:46:06 2017 -0700 : Delete Frame
  MOSTLY Working
| | | * | | cec410f - gjcarter, Tue Apr 25 20:54:42 2017 -0700 : Fixed a few merge
  errors and cleaned up some existing code. Added initializeTimeline from master code
  and fixed a potential seg fault in the function. Changed scroll bar code in new
  frame to only scroll to the right when the last frame is selected during an add.
| | | * | | 39aa522 - gjcarter, Tue Apr 25 20:11:21 2017 -0700 : Merge remote-tracking
  branch 'origin/master' into fixing_add_frame
| | | | \ \ \ \
| | | * | | | b2324e4 - gjcarter, Tue Apr 25 20:05:43 2017 -0700 : Added
  refreshTimelineDelete function for when a frame is deleted in the middle of the
  list. Needs testing. Renamed refreshTimeline to refreshTimelineAdd as it's only for
  cases where a frame is added in the middle.
| | | * | | | 1b25f7a - gjcarter, Tue Apr 25 19:58:01 2017 -0700 : Fixed that pesky
  final indexing bug. Renamed drawTimeline to drawFrame as it now only handles adding
  a single frame to the timeline.
| | | * | | | 6e1c1a7 - gjcarter, Sun Apr 23 20:07:15 2017 -0700 : New frame now
  correctly adds to the correct place on the timeline but still some bugs with the
  timeline relating to the last frame. Seems like it could be indexing.
| | | | / /

```

```

| | | | / | |
| | | * | | 97a0544 - gjcarter, Sun Apr 23 14:39:20 2017 -0700 : Fixed minor error with
    creating first frame.
| | | * | | e4ec907 - gjcarter, Sun Apr 23 14:37:26 2017 -0700 : Merge remote-tracking
    branch 'origin/master' into fixing_add_frame
| | | | \ \ \ \
| | | * | | | e6e8ce3 - gjcarter, Sun Apr 23 14:31:39 2017 -0700 : Fixed indexing bug.
    Timeline now correctly prints the 0th frame. Still have an issue with the timeline
    not correctly adding new frame to the correct position.
| | | * | | | 9ed1846 - gjcarter, Thu Apr 20 21:16:27 2017 -0700 : Add new frame and
    translate functions now add frame after the selected one. Added refresh timeline
    function to refresh all frames after one is added in middle. Bug with timeline due
    to FrameData always being added to the end of a scene.
| | | * | | | fa5b3bc - gjcarter, Thu Apr 20 19:22:43 2017 -0700 : Fixed issue where
    entire timeline was being updated on every click and new frame creation. Now only
    current selected frame is updated. Also fixed a bug where timeline was being updated
    on mouseClickedEvent causing frame to appear incorrectly in timeline.
| | * | | | 3fa30d1 - YupHio, Wed Apr 26 13:08:14 2017 -0700 : Fixed eye-dropper click
    lag
| | | | _ | / /
| | | | / | | |
| | | | * 8630dcc - tsonnen, Tue Apr 25 20:57:46 2017 -0700 : Fix starting new project
| | | | * 9120c46 - tsonnen, Tue Apr 25 20:40:45 2017 -0700 : Merge remote-tracking
    branch 'origin/master' into fileioInteg
| | | | | \
| | | | _ | _ | /
| | | | / | | |
| | * | | | 1994996 - Emma Bateman, Tue Apr 25 18:29:29 2017 -0700 : keep duration value
    when translating frame
| / / / /
| * | | | dfae731 - Emma Bateman, Tue Apr 25 17:50:42 2017 -0700 : up and down
    translation fix
| * | | | f8e6c2d - welc2421, Tue Apr 25 00:00:02 2017 -0700 : Palette and Eye Dropper
| * | | | e095c47 - Nick Krenowicz, Mon Apr 24 23:49:56 2017 -0700 : Doc screenshots
    update
| * | | | d6a4d39 - Nick Krenowicz, Mon Apr 24 23:44:21 2017 -0700 : Doc update & sprint
    4 outline
| * | | | 4266a52 - Emma Bateman, Mon Apr 24 23:04:24 2017 -0700 : copy and paste frames
| / / / /
| | | * 1577fd8 - tsonnen, Sun Apr 23 23:55:52 2017 -0700 : Merge remote-tracking
    branch 'origin/master' into fileioInteg
| | | | \
| | | | _ | _ | /
| / | | |
* | | | d2ef25d - Nick Krenowicz, Sun Apr 23 20:25:59 2017 -0700 : CopyFrame: missed a
    few instances & slight improvement
* | | | 81c6e76 - Nick Krenowicz, Sun Apr 23 20:07:39 2017 -0700 : Copy Frame into
    gridGridsquare moved to function
* | | | cd4a08f - Nick Krenowicz, Sun Apr 23 19:43:45 2017 -0700 : Removed some Comments
    and CurrentFrameData
| | | * f81c6b7 - tsonnen, Sun Apr 23 19:16:04 2017 -0700 : Draw Timeline on loading.
| | | * 5f4a823 - tsonnen, Sun Apr 23 18:56:48 2017 -0700 : Merge remote-tracking
    branch 'origin/master' into fileioInteg
| | | | \

```

```

|_|_|/
|/| |
* | | d9f0b6a - Nick Krenowicz, Sun Apr 23 14:44:46 2017 -0700 : Major optimize of add
    100 frames
| / /
|/| |
* | | d82461c - Nick Krenowicz, Sun Apr 23 14:08:06 2017 -0700 : Moved translate frame
    to ProcessTranslateFrame() function
* | | 57f025e - Nick Krenowicz, Sun Apr 23 13:46:26 2017 -0700 : Consistency Made sure
    every index, framecount, frameid Used the same data type: int > There were a few
    variations throughout the program > Tried making everything unsigned int but
    something broke the timeline draw.
* | | 358f3c6 - Nick Krenowicz, Sun Apr 23 13:30:49 2017 -0700 : Minor cleanups
* | | 2601ee4 - YupHio, Sun Apr 23 13:15:59 2017 -0700 : Timeline stays scrolled to the
    right when you add frames.
* | | 53456e8 - Nick Krenowicz, Sun Apr 23 12:38:56 2017 -0700 : Merge branch 'master'
    into Feature/Debug_Functions
|\ \ \
* | | 825740d - Nick Krenowicz, Sun Apr 23 12:38:43 2017 -0700 : Added Debug functions
    & removed a lag source
| | | * 4e1f924 - tsonnen, Sun Apr 23 12:39:17 2017 -0700 : Fix merge errors
| | | * c3cd18f - tsonnen, Sun Apr 23 12:30:41 2017 -0700 : Merge remote-tracking
    branch 'origin/master' into fileioInteg
| | | \
| | |_|/
| /| |
| * | | b33aa5d - YupHio, Sun Apr 23 12:19:54 2017 -0700 : Paint function for Tim
| * | | 871efb3 - YupHio, Sun Apr 23 12:02:35 2017 -0700 : Added some hover tooltips on
    buttons, kinda cool I guess.
| / / /
* | | 41225b6 - YupHio, Sun Apr 23 11:45:55 2017 -0700 : Filled out the rest of the menu
    slots.
* | | 7c298d1 - YupHio, Sun Apr 23 11:26:55 2017 -0700 : Play menu and Help menus are
    now functional.
| | * b364909 - tsonnen, Sat Apr 22 22:28:33 2017 -0700 : Added Save. Load is WIP
| | * 1f0f261 - tsonnen, Sat Apr 22 15:56:45 2017 -0700 : Change duration to sec.
| | * 867d717 - tsonnen, Sat Apr 22 15:12:41 2017 -0700 : Error Handling. Fix seg fault
    on not loading file
| | * c91650d - tsonnen, Sat Apr 22 14:49:14 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileioInteg
| | \
| |_|/
|/| |
* | | 67debeb - gjcarter, Fri Apr 21 19:34:47 2017 -0700 : Small optimization for new
    frames created. Timeline and grid already updated in newFrame function. drawGrid
    only needed on startup.
| | * a0bf15b - tsonnen, Fri Apr 21 19:45:10 2017 -0700 : Not Painting but no seg fault
| | * 50ffe8f - tsonnen, Fri Apr 21 19:06:50 2017 -0700 : Merge remote-tracking branch
    'origin/master' into fileioInteg
| | \
| | | * 51b4a71 - YupHio, Fri Apr 21 16:36:44 2017 -0700 : Add Frame now adds to next,
    not to end. Doesn't re-draw rest of frames tho
| | | * 7bd8c4d - YupHio, Fri Apr 21 16:23:36 2017 -0700 : Invisible frame and indexing
    fixed.

```

```

| | _|/
|/| |
| | * 414ba7e - tsonnen, Fri Apr 21 18:55:10 2017 -0700 : Seg fault work
| | * 5af8fe8 - tsonnen, Fri Apr 21 13:26:18 2017 -0700 : Work on segfault
| | * e4af5a4 - tsonnen, Fri Apr 21 12:38:23 2017 -0700 : Merge branch 'fileioInteg' of
      github.com:CS383Team2/Goofy_Lights_Editor into fileioInteg
| | |\
| | / /
|/| |
| | * a444668 - tsonnen, Fri Apr 21 00:44:31 2017 -0700 : Add load functionality to size
      select dialog
| | /
* | 9cea632 - YupHio, Fri Apr 21 12:05:47 2017 -0700 : Adds frame to timeline on start.
      Fix this later Nick. There is still an invisible frame or 2 created at program start?
* | efbf232 - YupHio, Fri Apr 21 11:39:49 2017 -0700 : Fixed crazy lag on drawing
      timeline
* | 1e4c953 - YupHio, Fri Apr 21 11:31:09 2017 -0700 : Red box is now Blue, by Joe's
      request.
* | bd16e1a - YupHio, Fri Apr 21 11:29:11 2017 -0700 : Fixed one click lag! Fixed player!
|/
* 177bac9 - Joe, Thu Apr 20 18:34:53 2017 -0700 : Updated timeline for sprint 4.
* 8d0d909 - Joe, Thu Apr 20 18:30:39 2017 -0700 : Added new timeline from meeting on
      4/20/2017

```

---



## 5 Files

### 5.1 globals.h file

This defines our global structure for all the global variables.

---

```
#ifndef GLOBALS_H
#define GLOBALS_H
#include "FrameList.h"

typedef struct point{
    int r;
    int c;
} point;

typedef struct Globals{

    int G_ROW;
    int G_COL;
    int G_FRAMECOUNT = 0;

    // For DrawLine
    point graphicPoint_1;
    point graphicPoint_2;

    QColor G_RIGHT = (Qt::blue); //default to blue just for hoots -P
    QColor G_LEFT = (Qt::red); //default to red to match colorwheel default -P
    bool EyeDropper = false;

    FrameList * G_FRAMELIST = new FrameList();

    int G_CURRENTFRAME = 0;
    bool G_TIMELINESELECTED = false;

    QString G_FILENAME = QString();
}V_Goofy;

extern V_Goofy V_GLOBAL;

#endif // GLOBALS_H
```

---

## 5.2 framestructure.h file

The FrameData structure used for every frame.

---

```
#ifndef FRAMESTRUCTURE_H
#define FRAMESTRUCTURE_H

#include <timelinegrid.h>

//Structre containing the data for each frame. This includes frame position,
//duration, and the color for each square of the frame.
typedef struct
{
    int ID = 0;           // Unique ID of frame. Static once generated.
    int Position = 0;     // Each Frames position in the time line, starting with (Head
                          // Nodes Position = 0)
    double duration = 0.2; // Frame Duration in MS

    TimelineGrid **squareData = new TimelineGrid*[20]; //Always set to 20
} t_FrameData;

#endif // FRAMESTRUCTURE_H
```

---

### 5.3 mainwindow.h file

Defines all the events for the GUI.

---

```
#ifndef MAINWINDOW_H
#define MAINWINDOW_H

#include <QMainWindow>
#include <QtCore>
#include <QtGui>
#include <QtWidgets>
#include <gridsquare.h>
#include <palettesquare.h>
#include <palette.h>
#include "FrameList.h"
#include <colorwheel.h>
#include <globals.h>
#include <timelinegrid.h>

extern PaletteSquare *Rcolor;
extern PaletteSquare *Lcolor;

namespace Ui {
class MainWindow;
}

class MainWindow : public QMainWindow
{
    Q_OBJECT

public:
    explicit MainWindow(QWidget *parent = 0);
    ~MainWindow();

    //MAIN WINDOW TOO BIG, gonna take the scaling down to 85% -P
    double max_size;
    double G_SCALE;
    int timelineScale;
    int t_SPACING;

    GridSquare **gridGridSquare; //Type is GridSquare, square is object
    t_FrameData FrameData;      // THE frame data (this is in mainwindow.h) -P
    t_FrameData CurrentFrameData;
    t_FrameData clipboard;
    bool clipboard_empty = true;
    QRect redSquare; //in .h -P

    //Updates timeline with current grid square
    void updateTimeline();

    //Function used to initialize timeline when many frames are being added at once
    void initializeEntireTimeline();
};
```

```

private slots:
    void on_actionSave_As_triggered();

    void on_actionOpenProject_triggered();

    void on_sbox_ValueRed_editingFinished();

    void on_sbox_ValueGreen_editingFinished();

    void on_sbox_ValueBlue_editingFinished();

    void mousePressEvent(QMouseEvent *event);

    void on_btn_FillFrame_clicked();

    void on_btn_ClearFrame_clicked();

    //Creates first frame of a new project or frame 0
    void createFirstFrame();

    void on_btn_NewFrame_clicked();

    void on_btn_DeleteFrame_clicked();

    void on_btn_TransRight_clicked();

    void insertFrame(t_FrameData newFrame);

    void on_dsbox_FrameDur_valueChanged(double arg1);

    //Processes translate button presses and performs actual translation actions
    void ProcessTranslateFrame(int DIR);

    void on_btn_TransUP_clicked();

    void on_btn_TransLeft_clicked();

    void on_btn_TransDwn_clicked();

    void on_btn_TransDwnRight_clicked();

    void on_btn_TransDwnLeft_clicked();

    void on_btn_TransUpLeft_clicked();

    void on_btn_TransUpRight_clicked();

    void on_btn_RepeatFrame_clicked();

    //Big function that handles all the actions that are needed related to drawing when
    //a new frame is
    //added. This includes adding the frame to the timeline, updating the timeline to
    //fit the new frame,
    //drawing the square around the new frame, and updating the grid with the new frame.

```

```

void newFrameHandler();

//Adds new frame to timeline
void drawFrame();

//Refreshes/updates the timeline after a new frame is added. This changes the
    timelinenumber of frames
//if needed to match the new indexing with the frame being added.
void refreshTimelineAdd();

void on_btn_PlayPause_clicked();

void on_actionAbout_triggered(); //Nick, check this out

void on_actionDocumentation_triggered();

void on_actionPlay_All_triggered();

void on_actionSave_2_triggered();

void on_actionNew_Project_triggered();

void on_actionClear_Frame_triggered();

void on_actionFill_Frame_triggered();

void on_actionNew_Frame_triggered();

void on_actionDelete_Frame_triggered();

void on_actionAdd_100_Frames_triggered();

void on_actionPrint_Frames_triggered();

void on_btn_CopyFrame_clicked();

void on_btn_PasteFrame_clicked();

void on_EyeDropper_clicked();

void drawPalette();

void on_btn_DrawRect_clicked();

private:
    Ui::MainWindow *ui;

    QGraphicsScene *gridScene; //grid -P

    QGraphicsScene *timelineScene; //timeline -P

    QGraphicsScene *currentcolorsScene;

    QGraphicsScene *paletteScene;

```

```
//Variable used to keep track if translate button was clicked so that
    newFrameHandler is
//only run once as it is in both the translate frame button click function and the
    new frame button
//press function.
bool translateClicked = false;

void createActions();
};

#endif // MAINWINDOW_H
```

---

## 5.4 FrameManipulation.h file

Functions for manipulating and creating FrameData

---

```
#ifndef FRAMEMANIPULATION_H
#define FRAMEMANIPULATION_H

#include "framestructure.h"

// Directions used in translate frame function
#define D_UP      1
#define D_DWN     2
#define D_LEFT    3
#define D_RIGHT   4
#define D_UP_L    5
#define D_UP_R    6
#define D_DWN_L   7
#define D_DWN_R   8

// Return codes
#define RTN_SUCCESSFUL 0
#define RTN_ERROR      1

// Prototypes

//creates a RGB Array and returns a pointer to it.
TimelineGrid** create_RGB(int r, int c);

//creates a RGB Array, returns a pointer to it, and assigns a frame number to the data
TimelineGrid** create_RGB(int r, int c, int frameNumber);

//Takes original frame and returns a new copy of it
int copyFrame(t_FrameData *copyFrame, t_FrameData *origFrame);

//Translate a frame to the given direction. For up and down swaps pointer rows around to
//move data. For left and right function has to move every single data point in the
//array in the
//specified direction.
int translateFrame(t_FrameData *d, int direction);

//Fills given frame with color
int fillFrame(t_FrameData *d, QColor rgb_fill);

//Takes in rgb values and assigns them to a QColor variable that is passed into
//fill frame along with the FrameData
int fillFrame2(t_FrameData *d, int r, int g, int b);

#endif // FRAMEMANIPULATION_H
```

---

## 5.5 FrameList.h file

The main linked list for storing all the Frames.

---

```
/* Tim Sonnen      Lab #5
 * 9/24/2015
 *
 * FrameList.h
 * Class that holds a linked list
 */

#ifndef LINK_H
#define LINK_H

#include <iostream>
#include "framestructure.h"
class FrameList{
private:
    struct Node{
        t_FrameData FrameData;
        struct Node *next;
        struct Node *prev;
    };
    typedef struct Node* NodePtr;

    NodePtr head;
    NodePtr tail;
    NodePtr advPtr; // pointer for advancing through the list
    int row, col;
    int count;

public:
    /* Constructors moved to the source file to comply with standards -T */
    // Constructor
    FrameList(int r, int c);

    FrameList(FrameList * frameList);

    // Constructor for empty FrameList
    FrameList();

    // Destructor
    ~FrameList(){
        FrameList::DeleteList();
    }
    // Add a node onto the end of the linked list.
    void AddTail(t_FrameData x);

    // Function will call DeleteNode for every item in the Linked List, and delete
    // the head node until all items in the linked list have been deleted.
    void DeleteList();

    // Delete the first node in the list.
    void DeleteNode();
```



```

// Add node at position x
// 0 will be the first node. 1 would be the 2nd node in the list.
void AddNode_Middle(t_FrameData x, int pos);

// Delete node at position x in the list
// If pos == 0 this refers to the head node, and
// If pos == count - 1 this refers to the tail node.
void DeleteNode_Middle(int pos);

// Added this function to do all of the time line adjustments in a stand alone
// function.
// This function will be called from the AddNode_Middle(), and DeleteNode_Middle(),
// before return.
// This function iterates through the FrameList and updates the Time Line Position
// index(s)
// after every add or delete.
void UpdateTimeLine();

// retrieve node at given position x.
// If pos == 0 this refers to the head node and,
// If pos == count - 1 this refers to the tail node.
t_FrameData * RetrieveNode_Middle(int pos);

// Return the first node found in the list
t_FrameData FirstNode();

/* Sets internal advance pointer back to head */
void AdvanceListReset();

/* Advance one node through the list & return Framedata pointer*/
t_FrameData * AdvanceList();

// Sets the row count
void SetRowCount(int r);

// Sets the column count
void SetColCount(int c);

// Get the row count
int GetRowCount();

// Get the column count
int GetColCount();

// Output the values in the nodes, one integer per line.
void PrintNode();

//Returns a value if the list is empty
int IsEmpty();

// Return a count of the number of nodes in the list.
int Size();

```

```
// Updates frame data
void UpdateNode(t_FrameData d, int position);

// Copies frameList into current frameList
int CopyFrameList(FrameList frameList);
};
#endif
```

---

## 5.6 FileOperations.h file

Handles all file related IO.

---

```
#ifndef FILEOPERATIONS_H
#define FILEOPERATIONS_H

#include "FrameList.h"
#include <QString>

class FileOperations
{
public:
    /* Save to a file */
    static int SaveToFile(QString fileName, FrameList * frameList);
    /* Load from a file */
    static int LoadFromFile(QString fileName, FrameList * frameList);
};

#endif // FILEOPERATIONS_H
```

---

## 5.7 gridsquare.h file

Handles the main grid and events

---

```
#ifndef GRIDSQUARE_H
#define GRIDSQUARE_H

#include <QPainter>
#include <QGraphicsItem> //What I'm building with this class -Paul
#include <QDebug>

extern bool newGridColor;

class GridSquare : public QGraphicsItem //inherit the public methods of QGraphicsItem
    -Paul
{
public:
    GridSquare();
    ~GridSquare();

    QRectF boundingRect() const; //MUST have a bounding rectangle for each square -P

    void paint(QPainter *painter, const QStyleOptionGraphicsItem *option, QWidget
        *widget); //paint function -P

    QColor square_RGB = Qt::black;

    bool Selected; //is this square selected? -P
    bool ClearSquare;
    bool leftclick;

    int x = 0; //drawing locations -P
    int y = 0;

    // For drawLine feature
    short row_pos = 0;
    short col_pos = 0;

protected:
    void mousePressEvent(QGraphicsSceneMouseEvent *event); //need to know when the
        things are clicked on -P
    void mouseDoubleClickEvent(QGraphicsSceneMouseEvent *event);
};

#endif // GRIDSQUARE_H
```

---

## 5.8 gridsquarewrapper.h file

Wrapper for gridsquare. Contains all the code that works with the main grid.

---

```
#ifndef GRIDSQUAREWRAPPER_H
#define GRIDSQUAREWRAPPER_H

#include "gridsquare.h"
#include "globals.h"
#include "framestructure.h"

class gridsquarewrapper
{
public:
    gridsquarewrapper();
    ~gridsquarewrapper();

    GridSquare ** gridSquareData = nullptr;
    QGraphicsScene *gridScenePtr; // This is created in mainwindow.cpp & passed to this
    object
    void loadFrame(t_FrameData *frameData);
    void setScene(QGraphicsScene *gridScene);
    void generate(); // creates memory
    void degenerate(); // deletes memory
    void drawGrid();

    void graphic_drawRect(point p1, point p2, QColor fillColor);
};

#endif // GRIDSQUAREWRAPPER_H
```

---

## 5.9 palette.h file

The palette class for recent colors.

---

```
#ifndef GRIDSQUAREWRAPPER_H
#define GRIDSQUAREWRAPPER_H

#include "gridsquare.h"
#include "globals.h"
#include "framestructure.h"

class gridsquarewrapper
{
public:
    gridsquarewrapper();
    ~gridsquarewrapper();

    GridSquare ** gridSquareData = nullptr;
    QGraphicsScene *gridScenePtr; // This is created in mainwindow.cpp & passed to this
    object
    void loadFrame(t_FrameData *frameData);
    void setScene(QGraphicsScene *gridScene);
    void generate(); // creates memory
    void degenerate(); // deletes memory
    void drawGrid();

    void graphic_drawRect(point p1, point p2, QColor fillColor);
};

#endif // GRIDSQUAREWRAPPER_H
```

---

## 5.10 player.h file

The animation player.

---

```
#ifndef PLAYER_H
#define PLAYER_H

#include <QDialog>
#include <QtCore>
#include <QtGui>
#include <QtWidgets>
#include <gridsquare.h>

namespace Ui {
class Player;
}

class Sleeper : public QThread
{
public:
    static void usleep(unsigned long usecs){QThread::usleep(usecs);}
    static void msleep(unsigned long msecs){QThread::msleep(msecs);}
    static void sleep(unsigned long secs){QThread::sleep(secs);}
};

class Player : public QDialog
{
    Q_OBJECT

public:
    explicit Player(QWidget *parent = NULL);
    ~Player();

    GridSquare **gridGridSquare;

    double max;
    double G_SCALE;
    int gridScale;
    int timelineScale;
    int g_SPACING;
    int t_SPACING;

private slots:
    void on_Btn_close_clicked();

    void on_pushButton_clicked();

    void drawGrid();

private:
    Ui::Player *ui;

    QGraphicsScene *gridScene; //grid -P
};
```

```
#endif // PLAYER_H
```

---



## 5.11 helpdialog.h file

Displays help and documentation dialog.

---

```
#ifndef HELPDIALOG_H
#define HELPDIALOG_H

#include <QDialog>

namespace Ui {
class helpdialog;
}

class helpdialog : public QDialog
{
    Q_OBJECT

public:
    explicit helpdialog(QWidget *parent = 0);
    ~helpdialog();

private slots:
    void on_pushButton_clicked();

    void on_pushButton_2_clicked();

private:
    Ui::helpdialog *ui;
};

#endif // HELPDIALOG_H
```

---