

Team 2 Goofy Lights Editor

CS-383

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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

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

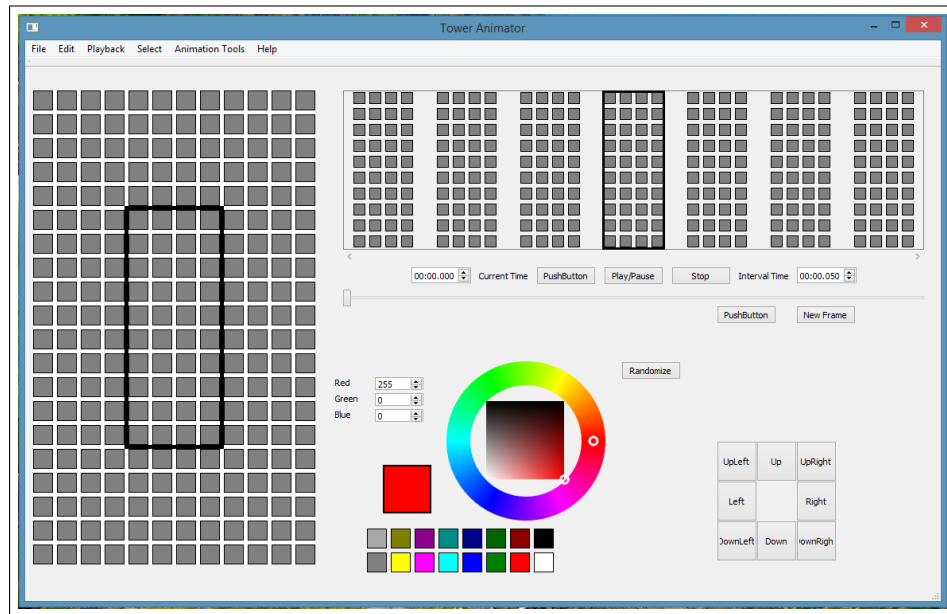


Figure 1: Original GUI design from previous tower lights project

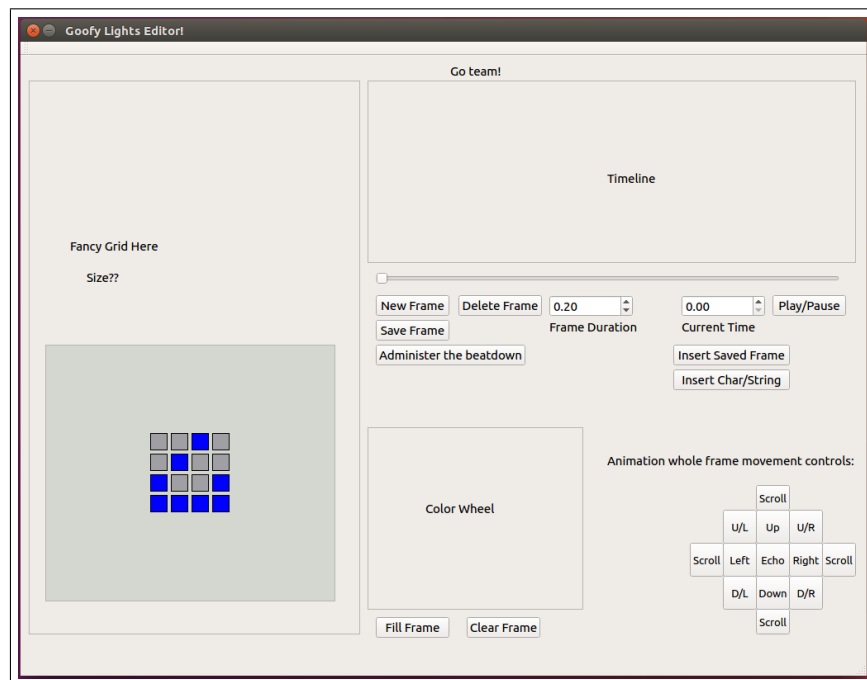


Figure 2: Our initial GUI after first sprint

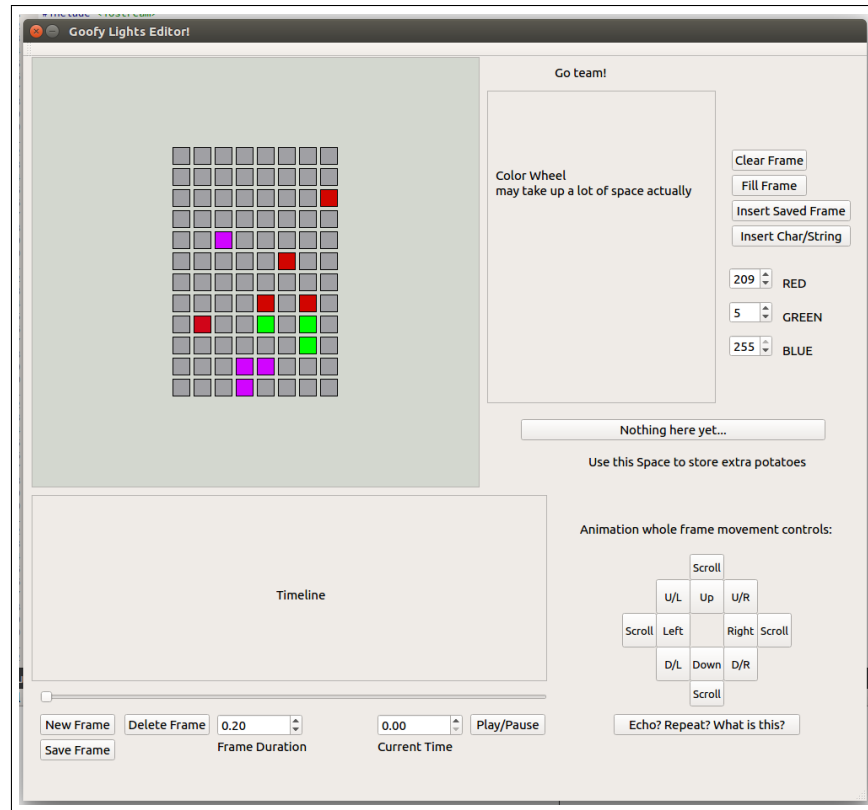


Figure 3: GUI after second sprint, RGB functionality added

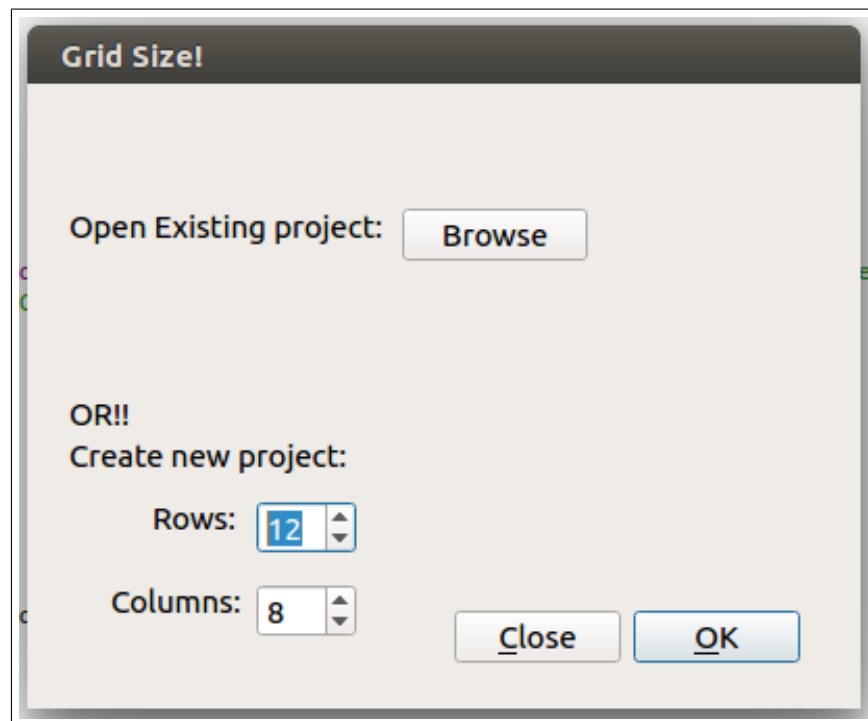


Figure 4: Grid size selection dialog added

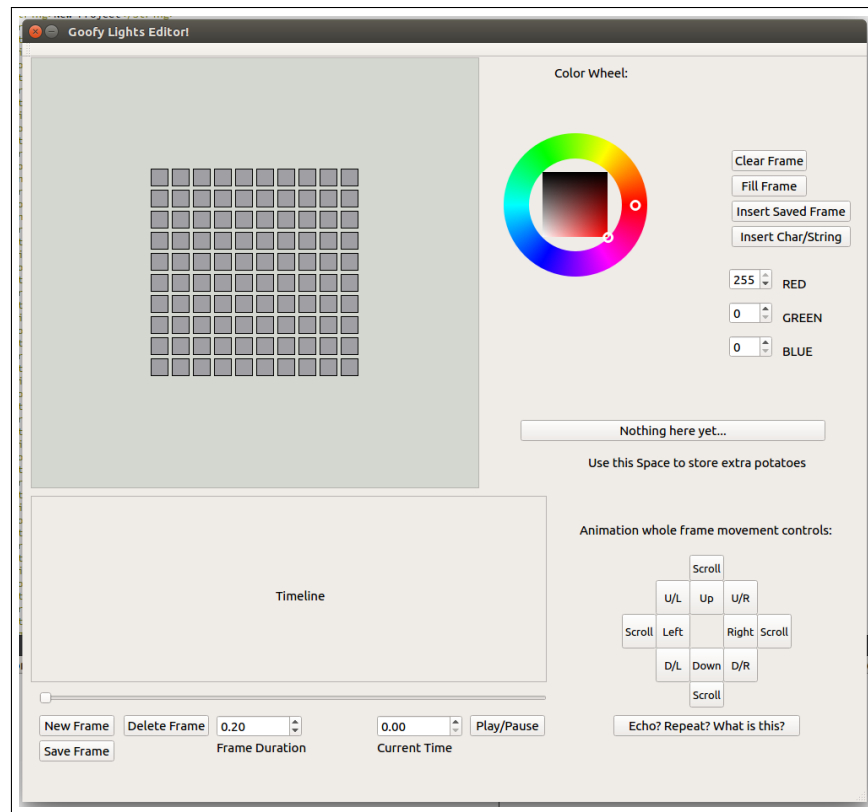


Figure 5: Color wheel added in sprint 3

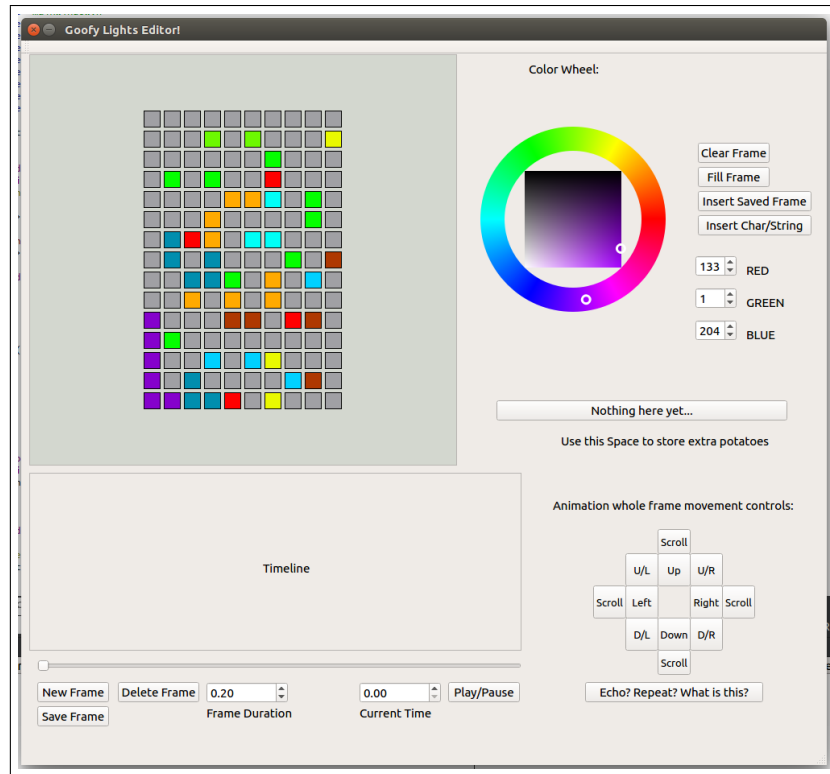


Figure 6: Color wheel demo

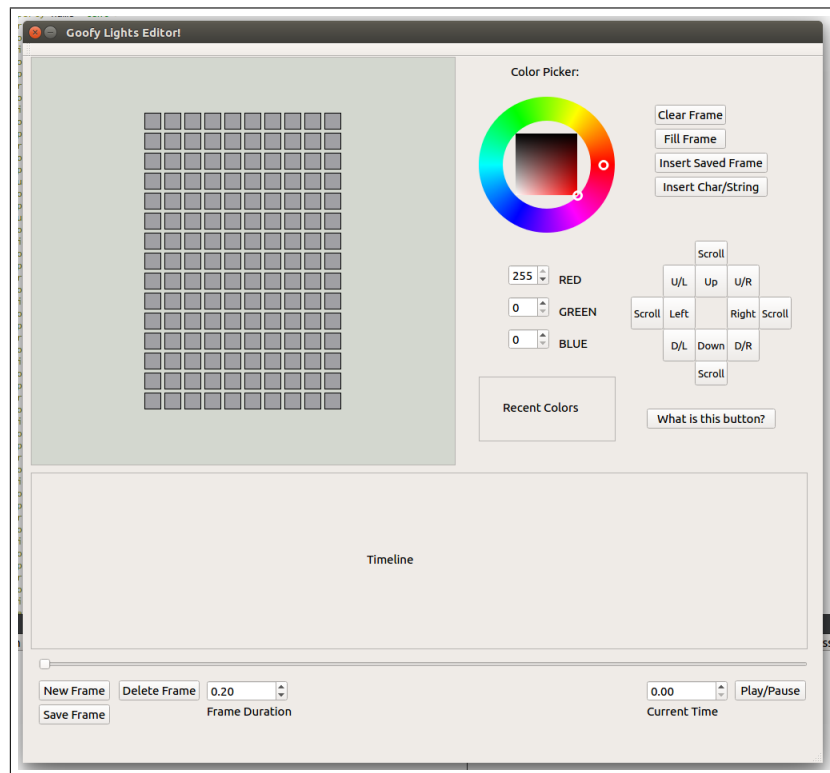


Figure 7: Control buttons moved in sprint 3

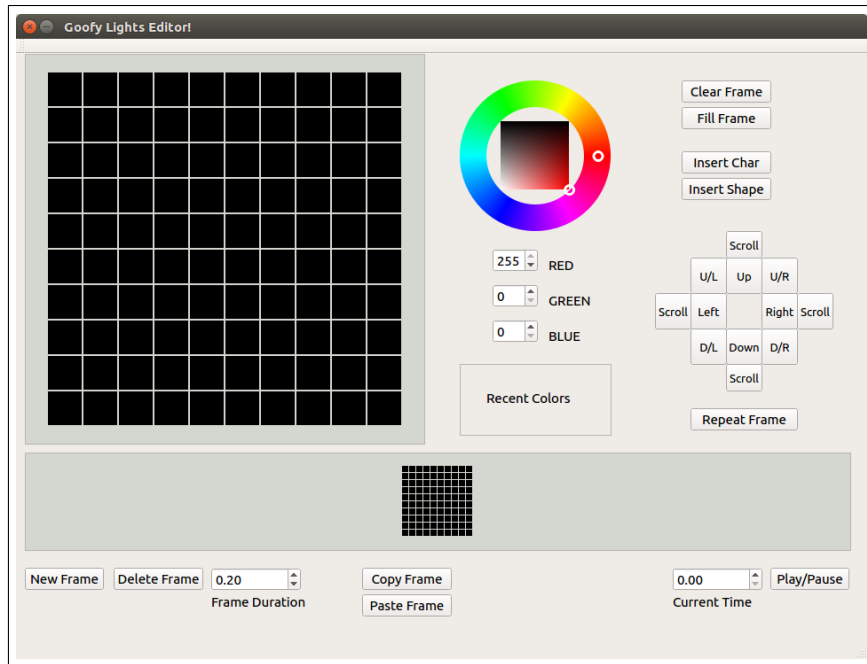


Figure 8: Timeline implemented. Default squares now black

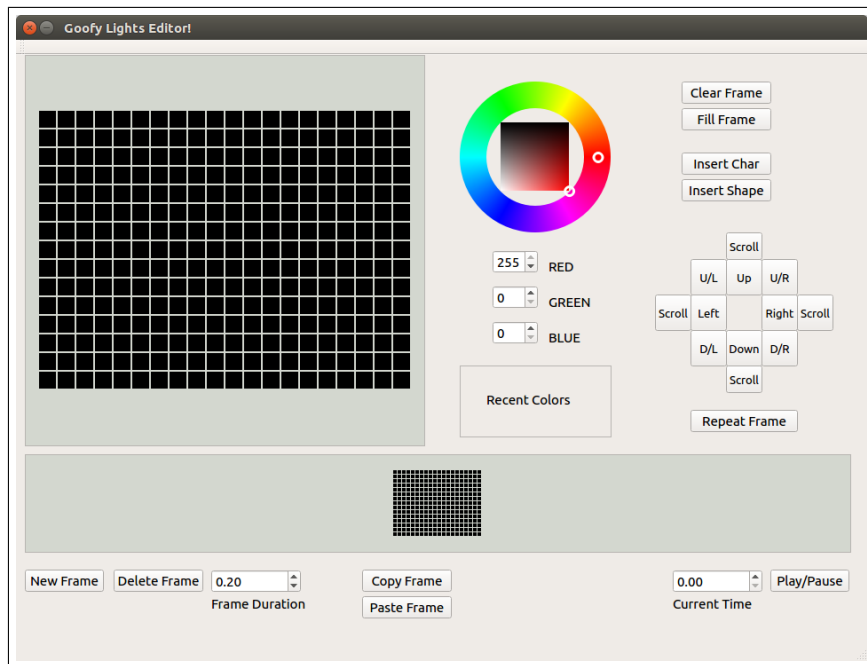


Figure 9: Grid size demo 15x20

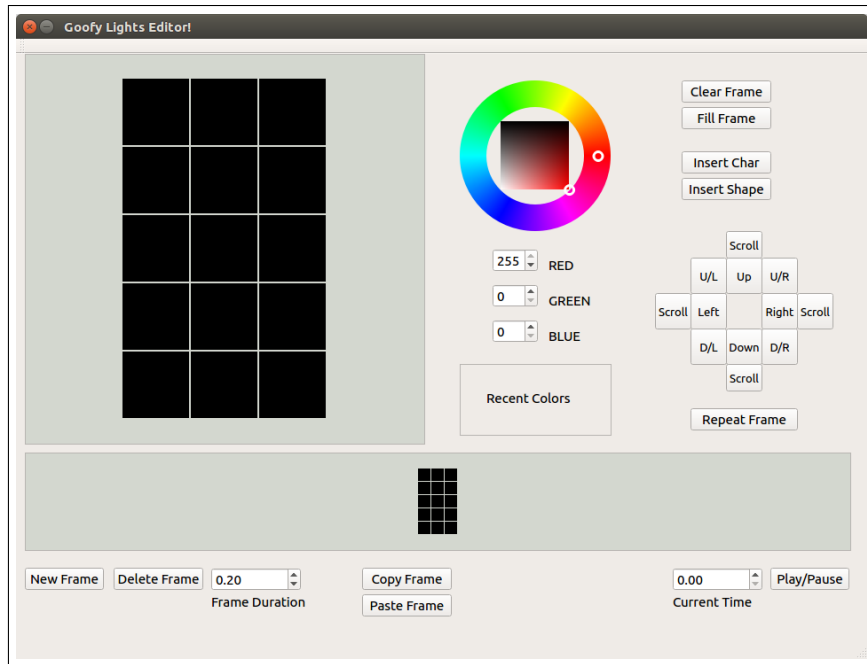


Figure 10: Grid size demo 5x3

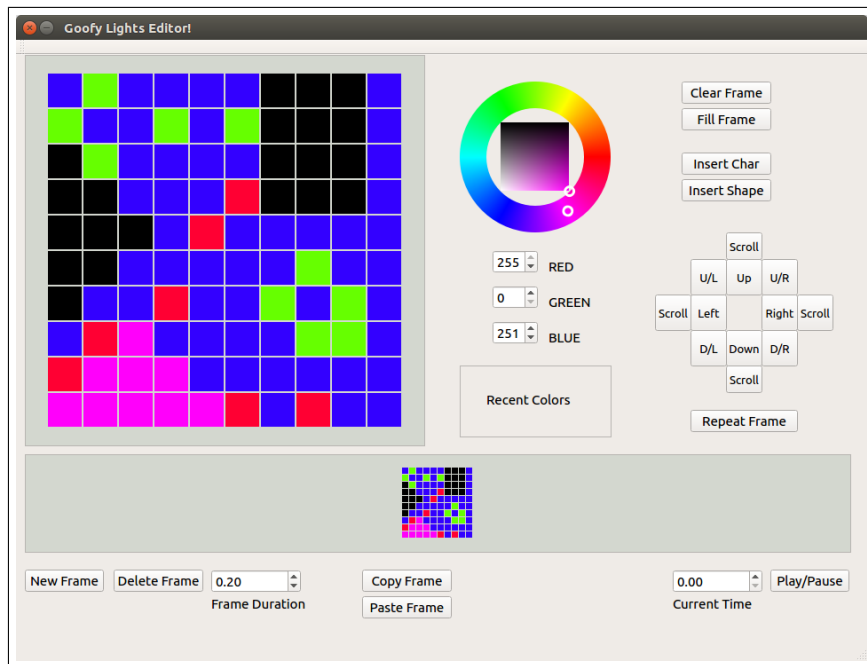


Figure 11: GUI usage demo at the end of sprint 3

2.1.2 UML Diagrams

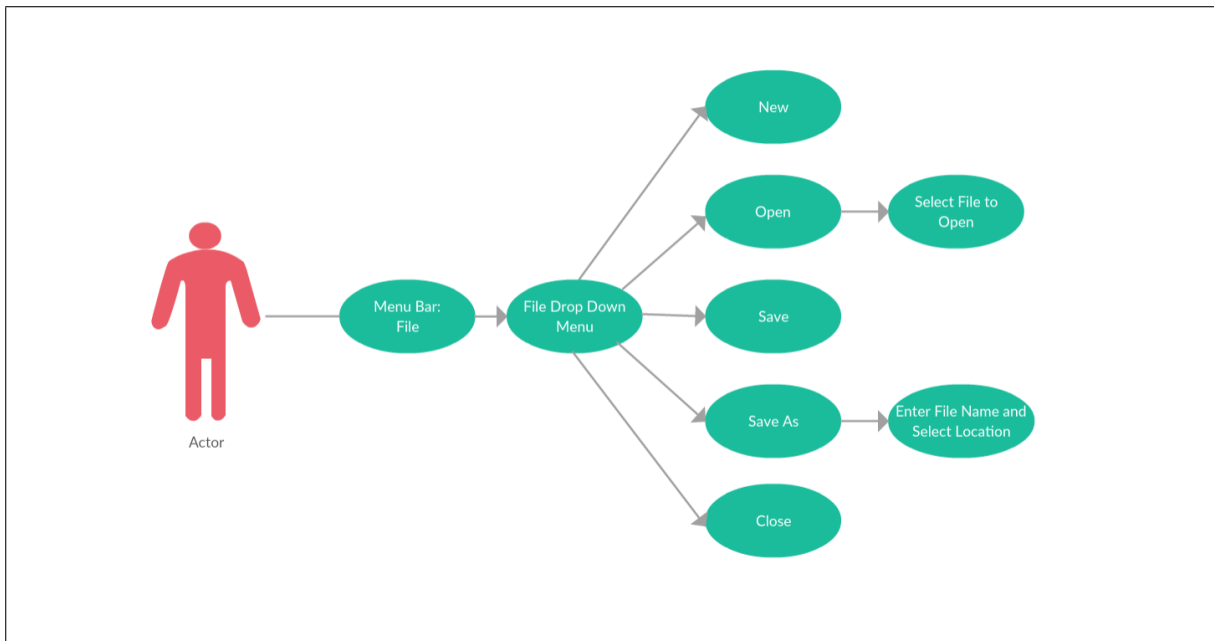


Figure 12: File manipulation

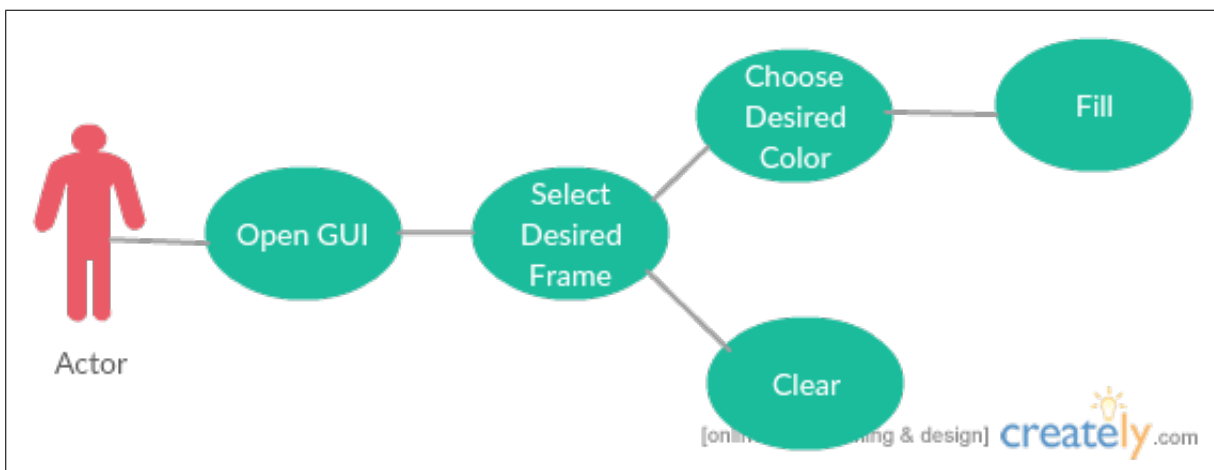


Figure 13: Fill or clear frame with current color

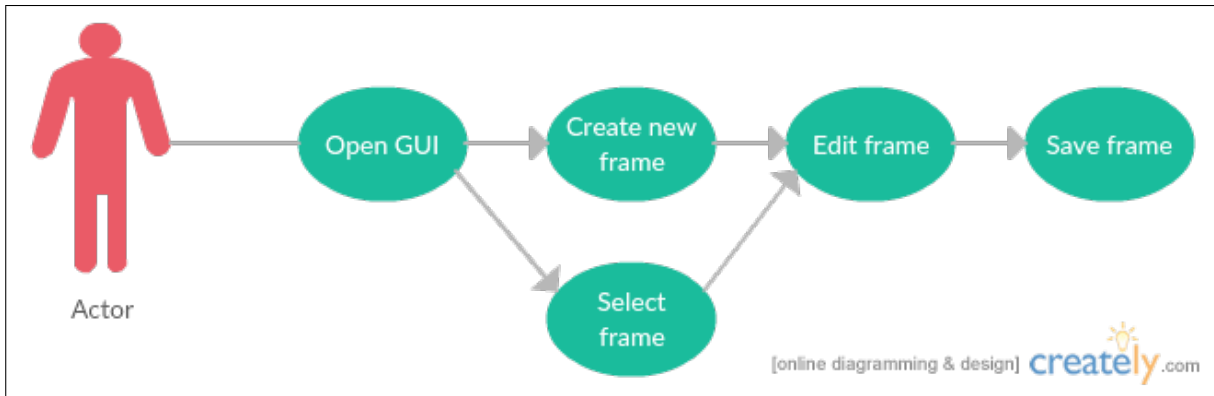


Figure 14: Save/copy current frame for re-use in animation

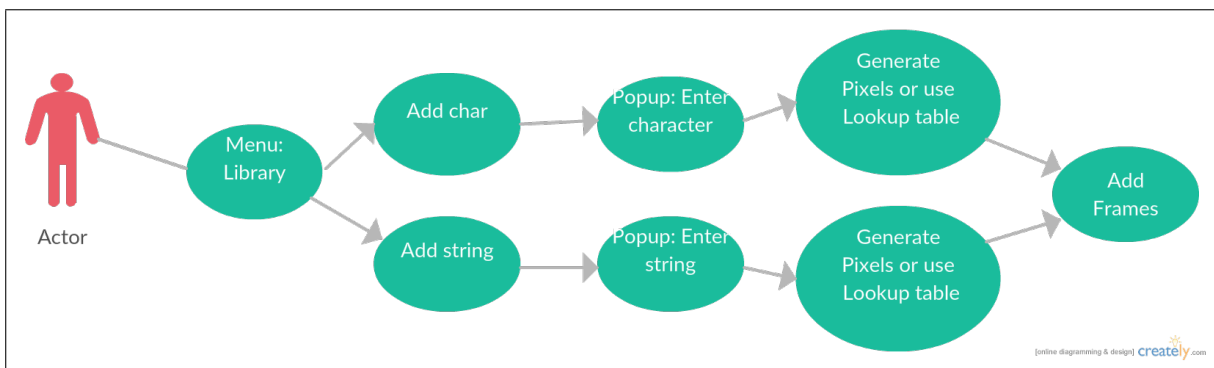


Figure 15: Add char/string from predefined set

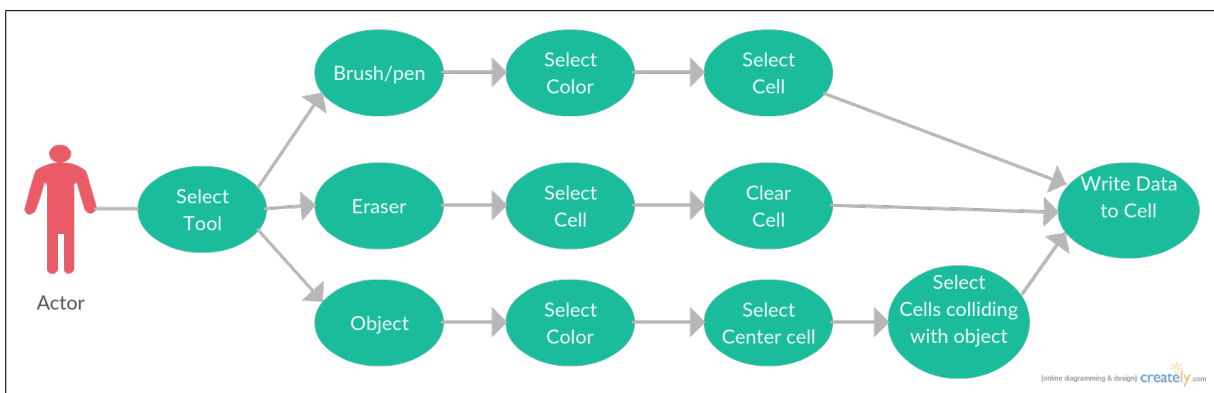


Figure 16: Add a pixel in any position in any color

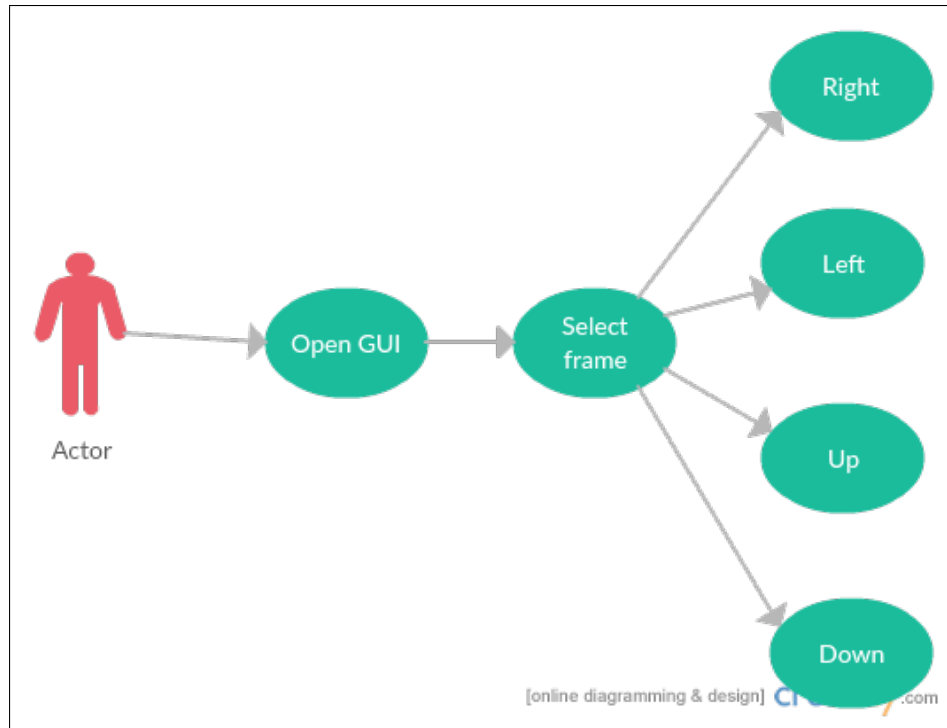


Figure 17: Move everything in frame 1 pixel in a direction

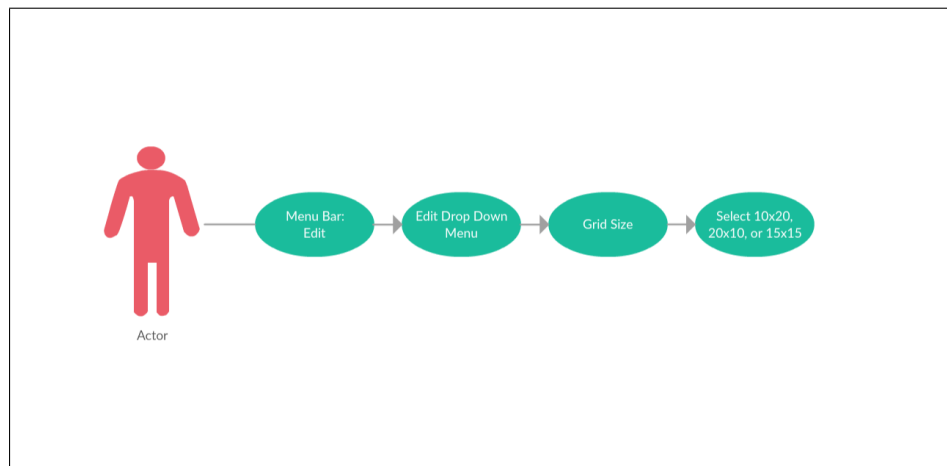


Figure 18: Choose grid size for the file

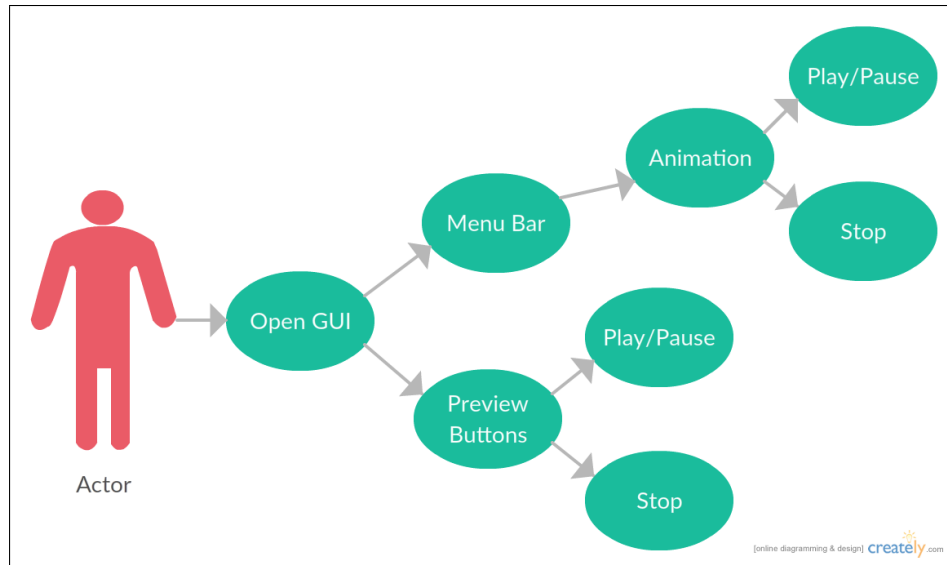


Figure 19: Preview play/pause/stop animation

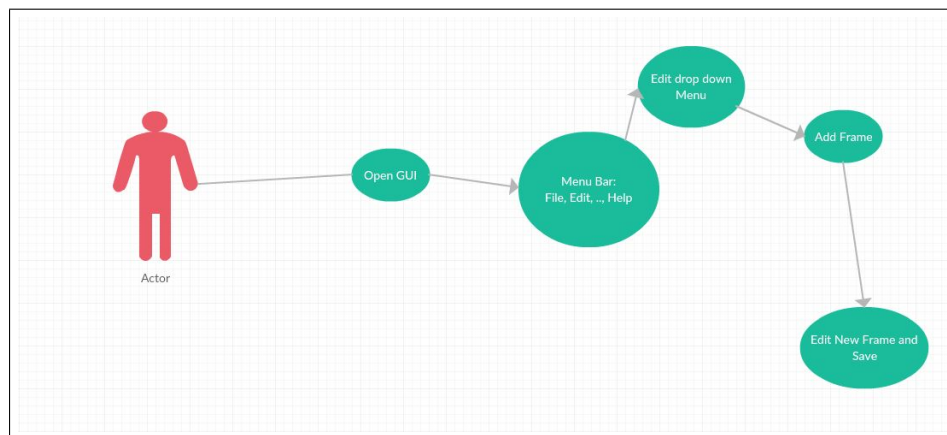


Figure 20: Create new frame

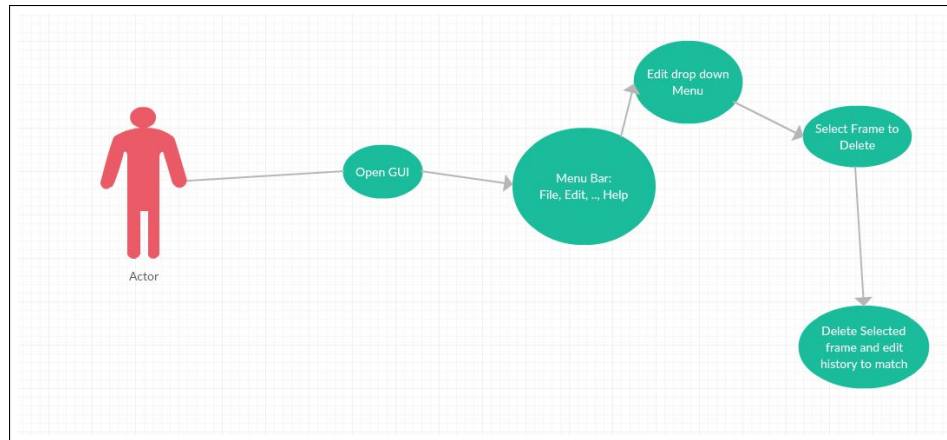


Figure 21: Delete a frame

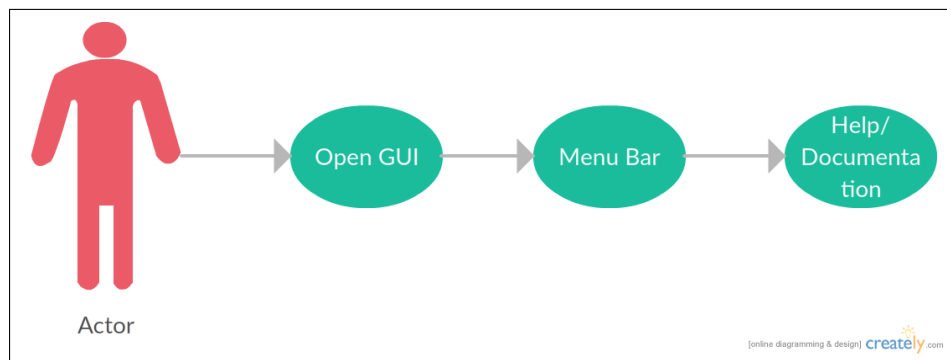


Figure 22: Open help/documentation text

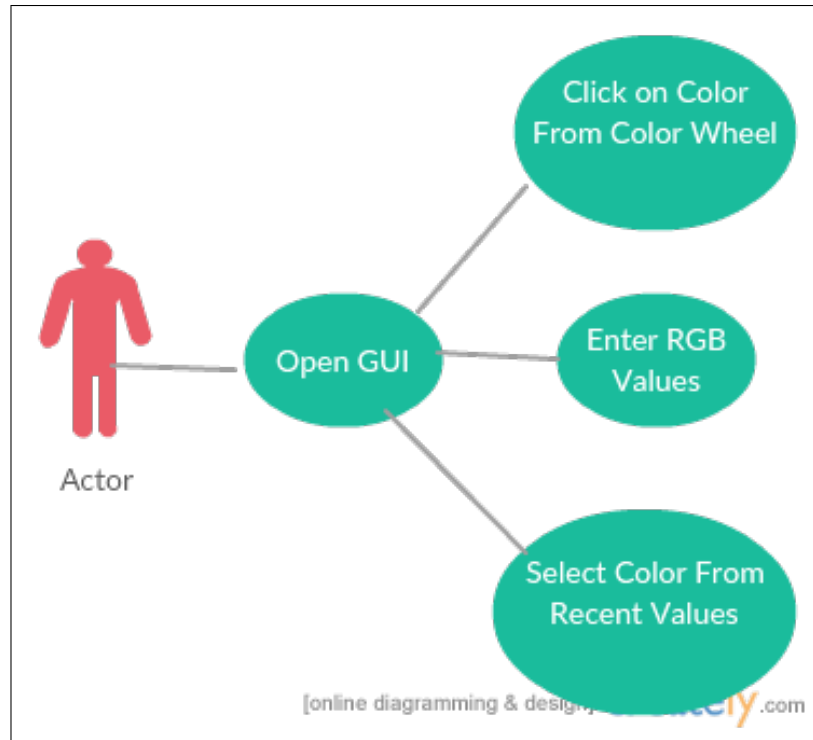


Figure 23: Chose a color on the colorwheel

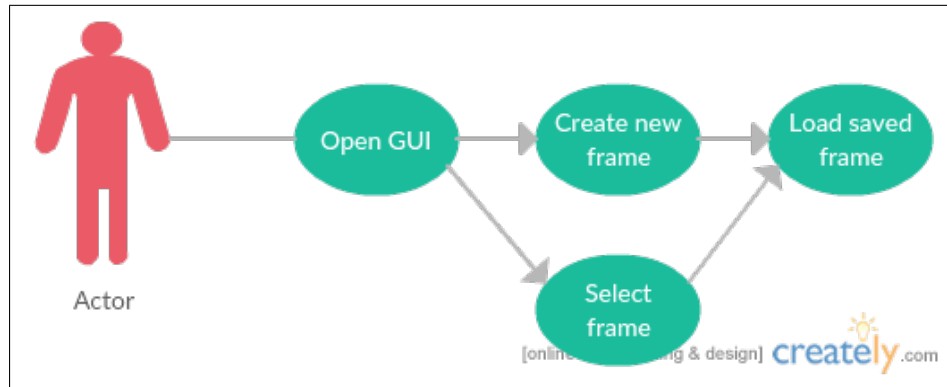


Figure 24: Insert a saved frame

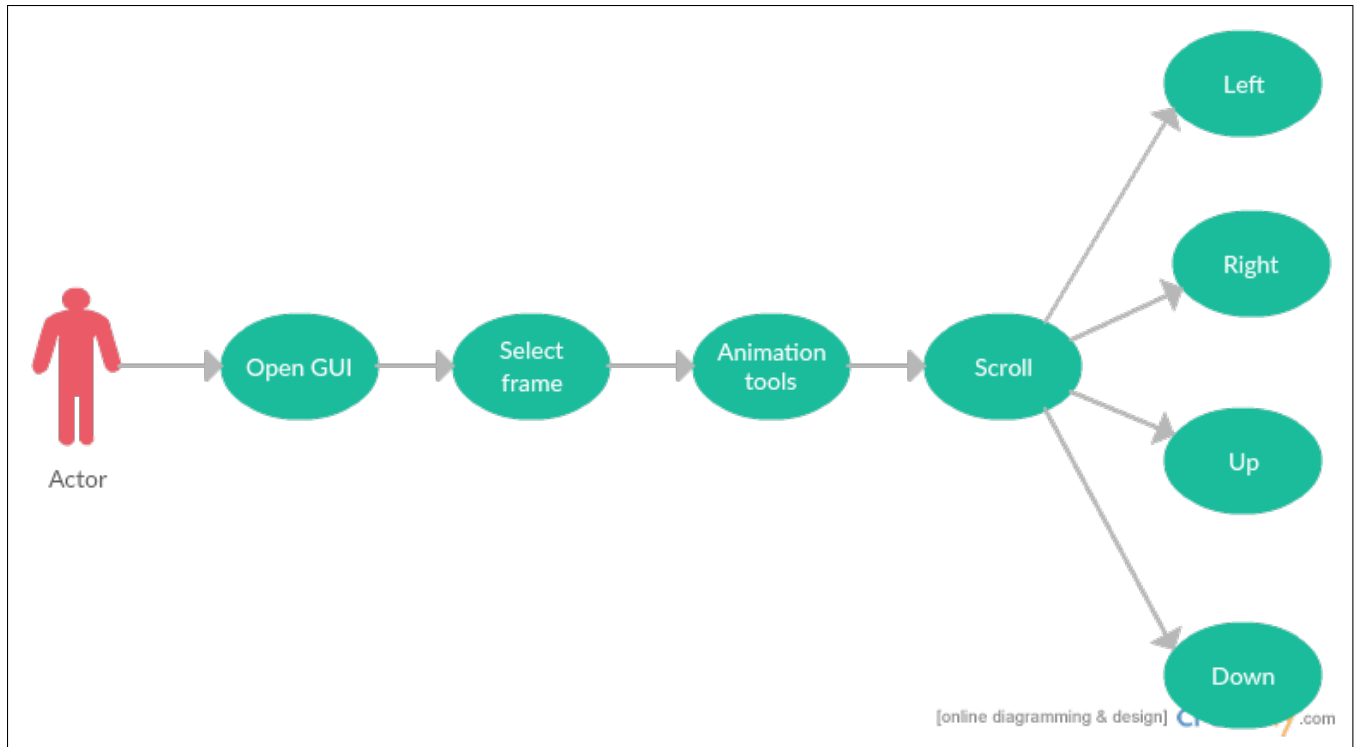


Figure 25: Scroll everything across entire frame

2.2 Timeline sprint 2

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

2.3 GitLog during sprint 2

Git log since 20170330

```
* 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

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```

| * | | | 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

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 Layout, beginning of sprint 3

3.4 GitLog during sprint 3

Git log since April 11th, 2017