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High Concept Document

Team
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Title: Knox Kninja

Genre
This is a casual arcade mobile game in the same vein as Fruit Ninja Classic.

Intended Audience (Target Demographic)
Since the game will focus on Knox students, our target audience will be current students, alumni, staff and faculty.

High Concept
This will be a mobile game, targeted for the Android platform. Just the user defending Knox against the conference. Other components such as food, bed(symbol for sleep) will act as an added bonus.

Description

In the fruit ninja theme, “sliceable” items will fly onto screen that need to be sliced, whereas other items should not be touched. Allowing “sliceable” items to leave the screen without being touched decrements lives, eventually resulting in the end of the game.

The theme will be a Knox sports focus; the world should be athletic themed and the user should be acting as a Knox fan. This school pride should serve as the motivation for the player, as well as the “plot.”

Features/Gameplay

- The game will consist of an initial start screen which will allow users to either play or check their high score, access settings, view credits, and view the tutorial (Help).
- A pause button will be accessible that allows users to quit to the main menu in the middle of gameplay.
- School logos of rival Midwest Conference Teams will fly onto screen. As the number 1 fan, the player is responsible for slicing these other team logos. When the Knox logo appears, the user should avoid touching it
- When either three rival teams logos exit the screen without being touched or when a Knox logo is touched, whichever comes first, the game will exit and the score and high score displayed

Unique Selling Points

- Catered towards Knox faculty and staff.
- Related to Knox experiences like food, weather, sports, conference teams, etc.
- Exciting features include changing weather conditions
- Accessible results and high score

Risk Analysis

- Integrating the slicing to touchscreen.
- Adding movement to logos with correct direction
- Frequency/timing of screen items
- Storing data
- Navigating scenes/panels
- Adding animation
- Familiarity with resources/aids/built in features
- General understanding and comfort with Unity

Game Design Document for Knox Kninja

Three Knox Kninja's, Charles Broomfield, Bishakha Upadhyaya, Nrepesh Joshi
15 January 2019

1 Introduction

Knox Kninja will be an Android platform casual 2D mobile game. This 2D arcade genre game will be a Knox themed game where the user will be defending Knox against the Midwest conference teams by slicing rival team logos. The game will be relevant to the Knox students with the components such as food, weather, and other components relating to students' experiences.

2 Game Overview

Knox Kninja will create a compelling and engaging game that will appeal to Knox students through ease of use, relatable goal, and casual gaming environment.

2.1 Narrative Game Description (including Core Game Play)

Knox Kninja will feature the Knox Number One Fan helping Knox athletic teams defeat conference competition. The game should be easily accessible, fun, visually appealing and easy to play for all Knox fans to support the team.

Users will first be shown a start screen, featuring a few different options such as statistics, help, and play. When the play game button is selected, the game will begin. Game play will consist of the fans swiping the screen in order to slice the logos of other Midwest Conference teams, while avoiding slicing the Knox logo. Extra power-ups will routinely become available as bonus items to assist the Number One Fan in supporting Knox. Play speed will increase, and special items will routinely become available in order to gain point bonuses. The highest score of the user will be stored for future measure. Once the Knox logo is sliced, or three non-Knox logo's fall off the screen, the game will end and the starting screen will be shown again.

2.2 Game Brief

- Knox Number One Fan as player
- One level high score system to see how well the user supported Knox athletics
- Bonuses available to increase score
- Fan attempts to slice Midwest Conference team logos before they fall from the screen, while avoiding the destruction of the Knox logo
- Different backgrounds, such as a football field, basketball court, a soccer field, or track that would be randomly selected each match

2.3 Game Mechanics and Rules

Objectives of the game:

- To bring a sense of communal support of Knox, against other midwest conference teams.
- As members of the cs-292 class, we share accomplishments of building a game by introducing it to the Knox community.
- A casual leisure time game for the members of the Knox community to enjoy.
- Player can show off highscores to other friends and earn bragging rights.

Mechanics and Rules	Function
Play, pause, settings and credit buttons	Buttons for the player to navigate to the game screen, change music volume and get info on credits of the game.
Falling emblems of conference teams	Emblems will start to appear sporadically in projectile motions expecting players' input. As the game progresses (after the player slices enough logos), the logos start appearing more frequently.
Slicing movements	The player has to use the touch screen to cut the logos in half using swiping movements.
Power-ups	Power ups will also appear on the screen along with emblems. The player has to successfully slice it to get additional points.
Highscore table	A counter will record the number of successful slices and bonus points achieved by the player. If the player hits a high score then they will be asked to submit their names for the high score chart.
Game over mechanism	The play continues until the player slices the Knox logo or fails to slice 3-non Knox logos.

2.4 Game Play Elements

The weapon will be automatically selected; the user will notice the trail or the effect of the weapon as they touch the screen. The weapon will follow their finger on the screen, giving the appearance of their finger cutting items.

- Weapon
    - Foam Finger

The Environment will be automatically selected, or chosen by the user. As this game focuses on Knox athletics versus the conference competition, the background will reflect different athletic arena's.

These environments, such as football, basketball, soccer, or baseball fields, will be displayed as the backdrop. Any other screens, such as the title screen and menus, will prominently feature Knox College school colors and design.

- Environment
    - Knox's field house / sports background
    - Knox color theme

Any switches will be easily featured on the main menu under a settings tab. This button will be easily seen from the first screen seen, so that it is easily introduced. Easy to see and bold tabs will allow users to easily interact.

- Switches
    - Changeable background
    - Changeable weapon
    - Sound/music

The items will appear on the screen during different times depending on their function. The rival conference team logos will appear as regularly sliceable items, whereas the Knox logo will appear less regularly, and should not be cut. These rules will be explained in the tutorial. Other power-ups will appear at other times, and their function will become clear.

- Items
    - Conference team logos
    - Knox's logo (bomb)
    - food, water, Blaze's spirit, sleep potions that will serve as point bonuses

When the users cut/touch these items, they will gain extra points. These items will be thrown onto screen similarly to other items, but at a different frequency, location, and benefit.

- Power-ups
    - Food items
    - Sleep items
    - Hydration items
    - Knox spirit items

2.5 Targeted Demographic Overview

Demographic **Characteristic**	% of Target
AGE: 17 and above	100%
SEX: Male Female	 50% 50%
EXPERIENCE WITH TECHNOLOGY (Mobile device, web-based apps): Mobile apps (smartphones, tablets) Web-based apps (online, Internet, browser)	 100% 100%
EXPERIENCE WITH DIGITAL GAMES	75%

EXPERIENCE WITH TEXTING	90%
RACE/ETHNICITY (Knox demographics): White Hispanic or Latino Black or African American Asian Other	 50% 15% 10% 15% 10%

3 Legal Analysis

For the development of this game we have used a number of royalty free assets and system services. Listed below are the services used and the legal terms of use.

3.1 Unity (Game development)

We are using Unity Personal to build our game. The terms of use of Unity personal are as follows.

> "The Financial Threshold for Unity Personal is US $100,000 for the most recent twelve (12) month period. To be Tier Eligible to use Unity Personal, your Total Finances may not exceed US $100,000. If your Total Finances exceed US $100,000 you may not use Unity Personal at all, even for internal projects or prototyping." -- Unity Terms of Service Source.

We plan to use royalty free assets and do not plan to advertise the game using any monetary value. Hence, as our total finances for developing the game does not exceed $100,000, we are eligible Tier eligible to use Unity personal for our project.

3.2 Unity Game Assets

We will be using Unity Game Assets for art, GUI, and sounds. The asset policy for unity store is as follows:

> "Once you have purchased an asset from the store, it becomes yours to do with as you like within your games and apps. You will be able to use them in your game for commercial use with no extra payments." Source

3.3 Freepic (Background)

Background pictures seen in the game were used from freepic. freepic.com license of use is as follows:

a. For commercial and personal projects
b. On digital or printed media
c. For an unlimited number of times, continuously

d. From anywhere in the world
e. With modifications or to create derivative works

Source

Our project fulfills all of these requirements, allowing us to freely and legally use the background art for this project.

3.4 Freesound.org

All SFX and background music for this game is from freesound.org which is under the creative commons license, allowing us to:

> "Share — copy and redistribute the material in any medium or format" and
> "Adapt — remix, transform, and build upon the material for any purpose, even commercially."

Source

This creative commons license gives our project freedom to use all sound assets needed for the game with no cost.

3.5 Fonts

3.5.1 Fruit Ninja Font

The title of our game will be displayed in the Fruit Ninja Font. The license for this font is summarized and accessible here:

> "The font is free for both personal and commercial use and you can download it here."
> Source

This license allows us to freely use this font on our title screen.

3.5.2 Google Fonts

Other fonts may be used for instructions, labels, displays, credits, or other. All fonts used will be found through Google Fonts, whose policy is listed here:

> "All the fonts in our catalog are free and open source, making beautiful type accessible to anyone for any project. This means you can share favorites and collaborate easily with friends and colleagues. Google Fonts takes care of all the licensing and hosting, ensuring that the latest and greatest version of any font is available to everyone." Source

3.6 Team Logos

All logos used go under the fair-use policy guidelines, whose regulations and explanation can be found at copyright.gov.

3.7 itch.io

We plan to use a GUI set from itch.io for all of our GUI elements. The set chosen is free, as shown from the link. Source

4 User Experience and Game Play

4.1 Level Design and User Interface

4.1.1 Resolution and Aspect Ratio

The aspect ratio will be 16:9, as this will be a mobile game. We plan to use 1280x720px a s the best resolution.

4.1.2 Moodboard

- Title font : The Fruit Ninja Font will be used for the title.

- Text font: We will use Quattrocento for our text, which may be limited to our Credits pages and any other large pieces of text. https://fonts.google.com/specimen/Quattrocento
We will use the Bangers Font for all short messages.
https://fonts.google.com/specimen/Bangers

- UI font : The Bangers Font will also be used for any UI text that is necessary.

- Color scheme:
We plan to use Knox College colors which include the following:
-Black #000000
-Gold #FCCB0D
-Dark Purple #612D60
-Brown(Woodish) #9E5018
-Light Purple #9F29D6
We used adobe to create our color palette- **https://color.adobe.com/create**

- Style (steampunk, 8-bit, etc.): Sporty and cartooney

- Mood you want to convey (happy, sad, desolate, etc.): Fast-paced competitive. Optimistic sporty

4.1.3 Concept Art

Logos:

Monmouth

Beloit

Cornell

Grinnell College

Illinois College

Knox

Lake Forest

Lawrence

Ripon

St. Norbert

Midwest Conference (Bonus)

GUI: We plan to use this GUI for the game as it goes well with our brown and gold color palette

Background:

4.1.4 Flowcharts and Storyboards


KNOX KNINJA
PLAY
EXIT


SCORE:


SCORE
PAUSED
CONTINUE
HOME

4.2 Functionality

The main screen will allow several user interactions. When the user selects the Play option, the title screen will disappear and game play will begin. As icons fly onto the screen, the users finger motion on the screen must result in the icons splitting in two. All icons must appear to obey gravity no matter the effect.

During the gameplay screen, the lives bar and score will not react to user touch. However, a pause button will be available to be tapped. The pause screen will halt game play and display a panel. The panel will allow users to resume gameplay or to exit to the menu. If a lose-condition is reached, a new panel will be displayed indicating the score reached, and an option to return back to the main menu.

Other options on the menu will include a credits option that will access a new panel that will display our names and all resources used, and which will feature a back option to once again return to the main menu. The main menu will also have a user selected option for Settings, which will access a new panel that allows users to select on and off buttons for background music and SFX. This panel will also feature back option that allows the user to navigate back to the main screen. Another option on the main screen will be a help/tutorial option, that should give instructions for how to play the game. This panel will also feature a back option that will return the user to the main option.

In addition, the highest score of that player will be displayed on the home screen. Finally, a quit option on the home screen will allow the user to close the application.

While all screens other than the game screen are shown, background music will be playing. As stated, this music can be turned off from the Setting screen. During the game, there will be no background music. Only sound effects will be attached to “sliceable” objects.

4.2.1 UI

Function	Description	Programmer assigned	Due date	Targeted build (prototype 1 and	Estimated number of

				2)	hours
Title Screen with buttons	Title screen for the game, plus play, settings, credits, tutorial, help, and quit buttons. Includes a high score display	Charles, Bishakha	February 3	Prototype 1	3
Play Screen	The screen displayed during gameplay, including a pause button, score indicator, and lives indicator	Nrepesh	February 3	Prototype 1	5
Game Over Screen	Screen displayed upon loss of game. Includes options to return home or to replay	Charles	February 24	Prototype 2	1
Settings Screen	The screen displayed when the Settings button is selected, including a Back Button and sound control for SFX and background. (Includes adding sound to the game)	Nrepesh	February 24	Prototype 2	1
Credits Screen	The screen displayed when the Settings button is selected, including a Back button	Bishakha	February 24	Prototype 2	1
Tutorial Screen	The screen indicating how to play the game, as well as a back button	Charles	February 24	Prototype 2	1
Quit button	Closes the game application when selected	Bishakha	February 24	Prototype 2	1
Sound Effects	Sound effects connected to all sliceable objects, things falling off the screen, and a score notification	Charles, Bishakha, Nrepesh	February 24	Prototype 2	6

4.2.2 Level 1

This game will consist of one level, which continues until the user reaches a lose condition. The level will require game objects to be shot onto the screen, and then fall off the screen in a manner that resembles gravity as if they had been thrown up from the bottom of the screen. Other objects may be “thrown” in from the side of the screen or have the appearance of being dropped from the top. Lose conditions consist of hitting the Knox logo, or allowing three non-Knox logos to leave the screen

4.3 Art

4.3.1 General UI Objects

The title screen buttons will consist of buttons (play, settings, credits, help, and quit). Upon selecting, the user will be directed to the respective screens. Settings will consist of a background control and SFX control. Health display will have three icons (Knox logos) indicating the number of lives left. Score counter will have a text indicating “Score” and the actual score(number) next to it. Pause menu will have a panel with resume button which will take the player back to the game screen and a home button which will take the player back to the title screen.

Asset	**Who**	**Due date**	**Build (Prototype 1 and 2)**	**Estimated Hours**
Sound controls in Settings panel	Nrepesh	February 24	Prototype 2	0.5
Back Button (on Settings, Credits, and Tutorial/Help	Charles	February 3	Prototype 1	1
Settings button	Charles	February 3	Prototype 1	.5
Credits button	Bishakha	Feb 3	Prototype 1	.5
Tutorial/Help Button	Bishakha	Feb 3	Prototype 1	.5
Quit button	Nrepesh	Feb 3	Prototype 1	.5

4.3.2 Title Screen

Asset	**Who**	**Due date**	**Build (Prototype 1 and 2)**	**Estimated Hours**
Background image	Nrepesh	February 3	Prototype 1	.5
Title	Bishakha	February 3	Prototype 1	.5
Highscore display	Charles	February 24	Prototype 2	2

4.3.3 Level 1

Asset	Who	Due date	Build	Estimated Hours
Rival logos	Charles	February 3	Prototype 1	1
Slash indicator	Bishakha	February 24	Prototype 2	1
Background image	Nrepesh	February 3	Prototype 1	.25
Pause Button	Nrepesh	February 3	Prototype 1	.25
Health indicator	Charles	February 24	Prototype 2	1
Current score display	Bishakha	February 24	Prototype 2	.5
Bonus logo	Charles	February 3	Prototype 1	.25

4.3.4 Other scenes that need descriptions (Instructions, Game Over, etc.)

Asset	Who	Due date	Build	Estimated Hours
Home Button on Game Over Screen	Bishakha	February 24	Prototype 2	.25

4.4 Sound and Music

We hope to create a sporty atmosphere that encourages users to try again. This music should fit the athletic story ark of our game, and make an encouraging environment for the user to continue playing and to do their best.

Background music- https://freesound.org/people/keweldog/sounds/223188/

- Wave: .wav
- Duration: 00:00:275
- Filesize: 37.6 KB
- Sample rate: 44100.0 Hz
- Bit-depth:16 bit
- Channels: Stereo

Slicing Sound Effect- https://freesound.org/people/Yap_Audio_Production/sounds/219002/

- Type: .mp3
- Duration:00:00:513
- Filesize: 145.5 KB
- Samplerate: 48000.0 Hz
- Bitrate: 690 kbps
- Channels: Mono

Knox Logo on screen- https://freesound.org/people/original_sound/sounds/493570/

- Type: .mp3
- Duration:00:08:085
- Filesize: 316.3 KB
- Bitrate: 1378 kbps
- Channels: Stereo

Hitting Knox logo sound effect- https://freesound.org/people/themusicalnomad/sounds/253886/

- Wave: .wav
- Duration:00:228
- Filesize: 211.7 KB
- Samplerate: 44100.0 Hz
- Bit-depth: 16 bit
- Channels: Stereo

Rival Logo falls off screen sound effect-https://freesound.org/people/Greencouch/sounds/124897/

- Wave: .wav
- Duration:00:00:998
- Filesize: 172.1 KB
- Samplerate: 44100.0 Hz
- Bit-depth: 16 bit
- Channels: Stereo

Score bonus hit sound effect- https://freesound.org/people/suntemple/sounds/253172/

- Wave: .wav
- Duration:00:00:343
- Filesize: 29.7 KB
- Samplerate: 44100.0 Hz
- Bit-depth: 16 bit
- Channels: Mono

Game Over- https://freesound.org/people/themusicalnomad/sounds/253886/

- Wave: .wav
- Duration:00:228
- Filesize: 211.7 KB
- Samplerate: 44100.0 Hz
- Bit-depth: 16 bit
- Channels: Stereo

Every 100 points indicator- https://freesound.org/people/Mativve/sounds/391539/

- Wave: .wav
- Duration:00:01:718
- Filesize: 296.3 KB
- Samplerate: 44100.0 Hz
- Bit-depth: 16 bit

- Channels: Stereo

4.4.1 Music and Sound Effects

The game will require constant background music that sets the tone of an athletic competition. It will only play during the title screen. Further events will utilize sound effects to indicate different events of the game. A whooshing sound can indicate a swipe on the screen. A crowd roaring can indicate a rival logo being sliced, as well as a bonus item being collected (a different audio file would be used). An indicator could also be used to denote a point mark being hit; such as every 100 points. A less positive sound can be used to denote a rival logo falling from the screen, the Knox logo being hit, and the game being over. A neutral sound can be used to indicate that a button was successfully selected, such as the play game button or credits.

Sound	**Scene**	**Who**	**Due Date**	**Build**	**# hours**
Background music	Title Screen	Nrepesh	Feb 24	Prototype 2	.25
Slicing Sound Effect	Gameplay	Bishakha	Feb 24	Prototype 2	.25
Hitting Knox logo sound effect	Gameplay	Charles	Feb 24	Prototype 2	.25
Rival Logo falls off screen sound effect	Gameplay	Nrepesh	Feb 24	Prototype 2	.25
Score bonus hit sound effect	Gameplay	Bishakha	Feb 24	Prototype 2	.25
Button pressed	Title Screen, Settings, Credits, Tutorial, Help	Charles	Feb 24	Prototype 2	.25
Game Over	Gameplay	Nrepesh	Feb 24	Prototype 2	.25
Every 100 points indicator	Gameplay	Bishakha	Feb 24	Prototype 2	.25

5 Testing

Approximate how many hours each team member will spend testing the game with users. There will be three sessions—paper prototype, digital prototype I, and digital prototype II.

	Who	**Due Date**	**# hours**
Paper Prototype	Charles	January 27	2.5
Paper Prototype	Bishakha	Jan 27	2.5
Paper Prototype	Nrepesh	Jan 27	2.5
Digital Prototype I	Charles	Feb 3	2.5
Digital Prototype I	Bishakha	Feb 3	2.5
Digital Prototype I	Nrepesh	Feb 3	2.5
Digital Prototype II	Charles	Feb 24	2.5
Digital Prototype II	Bishakha	Feb 24	2.5
Digital Prototype II	Charles	Feb 24	2.5

6 Timeline and Estimated Budget

Using the due dates in sakai, create a timeline for completion of the game. This will be the same as in the Proposal, but you will need additional time to create a test plan and run testing sessions for the Prototype, Alpha, and Beta Builds.
Using the estimated hours in the previous sections, propose a budget for your game. Create a table with the team members name, the total hours they have been tasked with, an hourly rate, and the total cost; for each team member. Total the cost for all members. Use rates consistent with entry level employees in industry for each area.
ADD UP ALL HOURS FROM ABOVE for every team member—ARE THEY EQUAL?

Who	**Total hours tasked**	**Hourly Rate**	**Total cost**
Charles	20.75	$31	643.25

Bishakha	18.5	$31	573.5
Nrepesh	18.25	$31	565.75
	Total hours for all: 57.5		$1,782.5

Sprint 1

Planning

All steps necessary to complete Design Doc, Paper prototype, prototype testing, and testing report

- Clean up legal analysis
- Fill out 4.3
- Assign 4.4 tasks and estimate hours
- Calculate hours and sum for sections 5 and 6
- Print out necessary materials for paper prototype
- Prototype testing
- Testing report
- Decide on music
- Clean up design doc

How will it be completed

- Legal Analysis - Nrepesh
- Fill out 4.3 - Charles
- Assign 4.4 tasks and estimate hours - Everyone
- Calculate hours and sum for sections 5 and 6 - Everyone
- Print out necessary materials for paper prototype - Bishakha
- Prototype testing - Everyone
- Testing report - Everyone
- Decide on music - Everyone
- Clean up design doc - Everyone

How long will each task take

- Clean up legal analysis - 15 minutes
- Fill out 4.3 - 15 minutes
- Assign 4.4 tasks and estimate hours - 30 minutes

- Calculate hours and sum for sections 5 and 6 - 30 min
- Print out necessary materials for paper prototype - 30 minutes
- Prototype testing - 1 hour
- Testing report - 2 hours
- Decide on music - 15 min
- Clean up design doc - 30 minutes

Sprint 1 Stand Up Report

January 27, 2020

What have you done since the last daily standup meeting?

Charles: Individually, I helped clean up and reword some sections of the design document, while also filling out many of the tables concerning various assets. Most other work has been with the team, such as helping create the paper prototype, assigning tasks and hours, and agreeing on art and sound decisions.

Bishakha: I worked on making story board and printing the paper prototype essentials. I also worked on some of the description of the tables in the design document and the rest of the decision and work regarding the details of paper prototype and assigned tasks was done was done together as a team.

Nrepesh: Most decision making sections were conducted as a team. Individually, I worked on the legal documentation and documenting the game sound requirements. Reviewing the design document and making a list of possible GUI elements.

What will you be doing between now and the next standup meeting?

Charles: I will assist with testing the paper prototype and in creating the prototype report for the testing session.

Bishakha: I will be working on the paper prototype report and testing.

Nrepesh: Paper prototype and testing report.

Is there anything standing in your way?

Charles: I do not anticipate major barriers between now and Wednesday, but instructions for the testing report are still a variable. Communication about responsibilities for it, and what it entails, will be vital.

Bishakha: I don't think there's anything worrisome about the testing and report other than the testing not going as we have planned.

Nrepesh: Git version control and implementing the mechanism of the game planning for the first prototype.

Sprint 1 Review

What went right?

We had great communication through Sprint 1, and were all able to find time to meet together for the important tasks. Each one of us has contributed meaningful work. We have also been responsive and helpful when members have had questions or been stuck. We have all worked collaboratively on debugging and any issues, and saw a lot of great work come from it.

We are proactively improving our design to optimize our game already, and have seen better design and user interactions already. Openness to new ideas has been crucial to our success.

We all played helpful roles for the testing, as well as the creation of the paper prototype. Individual tasks have been completed in a timely manner, and we do great productive work while working together.

What did not go right in the sprint?

We have had very few issues during Sprint 1; the biggest challenges were determining the game elements we wanted and cleaning up the design document.

We also had limited resources in the creation of the paper prototype, which led to some frustration.

Our testing was also limited; we were unable to show all the mechanics that we would have liked to. This led to some negative reviews, but we are confident this will not be an issue in the digital version.

What will we do to improve the process in future sprints?

We will continue to use all necessary communication channels in order to maintain an efficient and collaborative process. With the implementation of GitKraken, we will be required to create new protocols and processes for the creation of our game. We must also spend more time and effort on effective and fair division of labor to ensure a true collaborative result.

Sprint 2 Stand Up Reports

February 3, 2020

What have you done since the last daily standup meeting?

Charles: During prototype testing, I acted as the notes taker to ensure responses and feedback were accurately recorded. In addition, I assisted with the creation of the testing report to ensure the data was easily accessible and organized for future use.

I have been the primary worker on the design document, ensuring that all formatting is correct and that all feedback is appropriately implemented in terms of layout and presentation.

I have also acted as configuration manager for merging work on the game, and was the primary creator of the tutorial panel.

Nrepesh: For the paper prototype, I made the elements pop up on screen and showed the transitions. We compiled all the findings from the testing and completed our paper prototype report. Made a skeleton transition for the game with panels and coordinated that with GUI buttons. Uploaded the buttons and boards GUI. Worked on making buttons disappear when panels were on.

Bishakha: Worked on paper prototype report together. I edited the background for the game and uploaded the background and font files to the game. I also worked on the credits panel and assisted Charles on the tutorials panel.

What will you be doing between now and the next standup meeting?

Charles: I will likely be working on animations for the game, as I have access to all of the logos that will need animation. I also expect to assist with beautification of the game, and general layout or interactions. Our plans have, by necessity, been flexible so that I may assist with any other tasks or hiccups in the design.

In addition, I will support with the presentation of our progress to the class and prepare for Prototype 1 Testing as needed.

Nrepesh: I will be working on integrating the random elements that pop appear on screen and add the slicing effect to show the animations. We will also be preparing for the presentation on the Prototype 1 in-class review.

Bishakha: I will be working on fixing the images for the tutorials panel and working to randomize the speed and the direction of elements falling on the screen. We will be preparing for our roles during the presentation on Wednesday.

Is there anything standing in your way?

Charles: We are continuing to better our understanding of GitKraken, and as a team must ensure we have an appropriate process for committing our modifications to the game. There are also mechanics or effects that the team and I have not done before, so I am

expecting unexpected issues. With strong communication and proactivity, I am confident we will manage.

Nrepesh: Since we will be working in one scene to include the gameplay, we need to continue communicating for a smooth integration. I still need to do some research on how to make the game mechanics work.

Bishakha: Understanding how to tackle the issues that arise during merging the scenes has been my major concern. In addition to that, limited knowledge and experience with Unity could be a challenge when working on the game play mechanics.

Paper Prototype Game Test Template

Goals, objectives, and research questions

The goals of this study are to determine if Knox Kninja may be fun, engaging, and has good game balance for the targeted demographic, Knox students. This is based on the paper prototype testing only.

The objectives of this study are to:

- Determine if the game play is fun and engaging for Knox Students, Knox Faculty, and Knox Staff
- Determine if the game play has good game balance for Knox Students, Knox Faculty, and Knox Staff
- Get feedback on the game in general

Therefore, the primary research questions for this study are as follows:

- Do Knox Students, Knox Faculty, and Knox Staff find the game fun?
- Do Knox Students, Knox Faculty, and Knox Staff find the game engaging?
- Does the game have good game balance for Knox Students, Knox Faculty, and Knox Staff?
- What feedback do players have about the game?

The test plan and all of the test questions will be derived from these primary research questions.

Methodology

In this paper prototype session, we will investigate the data gathered about the game Knox-Kninja. We plan to test our game only with our targeted demographics (Knox Students, Knox Faculty, and Knox Staff). We will collect data about the actions, experience and general understandings of the participants when they play the game. Data will be collected in both quantitative and qualitative format. Once the data is collected, it will be summarized and a list of recommendations will be provided based on player feedback.

We will sit in our classroom A205 with the participants and all group members. We will introduce the session, conduct a short background interview, introduce tasks as appropriate and conduct a post-game interview about their experience and feedback. During the actual gameplay, no advice or suggestions will be given, but clarifying questions may be asked to better understand the players thoughts and expectations. One of the team members will be observing the user's behaviors/actions and taking detailed notes.

Session outline, Session Scripts, and Timing

The test sessions will be 11 minutes long. We will use approximately three minutes to set up and introduce the tester to the game.

Actions	Time Allotted	Description
Pre-test arrangements	1	Before the participant sits down in front of the game, the home screen will be placed as the starting screen, the high score set to 0, and all other items prepared to the side but off the screen.
Introduction to the session	2	At this point, the script will be read introducing the player to the game, and several demographic questions asked. After this point, if the tester has no questions, they will be allowed to begin play.
Game Play	5	The player will be allowed to play the game, hitting any button and opening any menu. No instructions will be given, but clarifying questions may be asked to better understand the testers thought process.
Post-test Survey/Interview	2	We will give them the post-test survey. (see appendix)
Post-test debriefing	1	We will follow up on any particular problems that came up for the participant. We will make sure they leave the testing session feeling good about their contributions! And we will thank them for their participation.

Findings

The purpose of this paper prototype test was to answer the following questions:

- Do Knox Students, Knox Faculty, and Knox Staff find the game fun?
  Yes, all feedback was positive
- Do Knox Students, Knox Faculty, and Knox Staff find the game engaging?

Yes, players seemed to enjoy the game.

· Does the game have good game balance for Knox Students, Knox Faculty, and Knox Staff?

The game seemed relatively balanced, but difficulty will largely be determined by the digital implementation. It should become harder as the levels increase, so that everyone finds a good spot for them.

· What feedback do players have on the game?

The players seemed to like the overall look, feel and concept of the game. Based on the observation and feedback, the buttons weren't obvious enough so adding text instead of the buttons would be helpful. To make the tutorials more clear, visuals of the details of the game were preferred.

Participant Demographic Summary

Demographic **Characteristic**	% of Target
AGE: 17 and above	100%
SEX: Male Female	 60% 40%
EXPERIENCE WITH TECHNOLOGY (Mobile device, web-based apps): Mobile apps (smartphones, tablets) Web-based apps (online, Internet, browser)	 100% 100%
EXPERIENCE WITH DIGITAL GAMES	100%
EXPERIENCE WITH TEXTING	100%
RACE/ETHNICITY (Knox demographics): White Hispanic or Latino Black or African American Asian Other	 20% 0% 0% 80% 0%

Qualitative Feedback from Testers

- Will it be fun?
    - Yes
    - Yes
    - Yes

    - Yup
    - Yes
- What did you like best?
    - The concept and artwork. Relaxing, but pace might change. Boring if speed does not change
    - Liked the different team logos. Intuitive. Likes GUI
    - Likes the slicing part. Likes the GUI
    - The concept; logos and teams. Likes slicing
    - The slicing effect of the game. UI had no bugs
- What did you like least?
    - Mechanics are the same, not very many variables. More special effects?
    - Not familiar with sports. Did not recognize the footprint.
    - Everything seems fine. Decent animations.
    - Did not know how it ended; we think this is just part of the paper prototype. No win condition
    - Maybe have game over have the score and the high score. Wanted more bugs. Bonus should come more often
- Other suggestions?
    - Make the game faster as it goes. Add special effects.
    - Make logos more familiar; maybe replace lake forest.
    - Randomize speeds, and maybe not 1 by 1
    - Not really. Was wondering about lives. Maybe make lives a part of the tutorial.
    - No

Observations

Feedback on Tutorial:

- Did not hit tutorial, did not know how to play. Had to pause and exit
- Hit tutorial button after play. Laughed when they saw they were not supposed to hit the Knox logo
- Hit play first, but did not need assistance
- Hit tutorial button first
- Hit tutorial button first, implying understanding of its meaning

Feedback on Gameplay

- Understood the gameplay after reading the tutorial
- Understood the gameplay except the Knox logo as a bad thing to hit
- Understood the gameplay, familiar with fruit ninja
- Understood the gameplay after reading the tutorial
- Did not understand the lose condition or purpose, kept playing expecting something

Feedback on UI

- Navigated buttons well, did not seem surprised. Liked the art
- Did not immediately identify what the tutorial and the credits buttons stood for

- Did not navigate all the UI buttons, but liked art
- Only one to use the exit application button
- Expected panel to close by re-tapping icon rather than hitting the X

Recommendations

The reaction to our game was mostly positive, but there were a few suggestions. First off, the tutorial button should be labelled and more helpful to players so that first-time players are not surprised or confused. I think all the buttons could be reordered to easier for players to navigate and make sense of.

There were also recommendations to have increased speed and difficulty for the game. This was already the plan, simply difficult to implement in a paper prototype.

One user recommended making more apparent the teams or mission of the game. A different logo for Lake Forest could be picked for easier understanding of the game, or we could include all enemy logos in the tutorial.

A final recommendation is to have more special effects. This may not be implemented due to time constraints.

Recommendations to be Addressed

Tutorial button should be more clear	Text(Tutorial) will be added on the title screen to make it more apparent
Tutorial should have more visuals instead of text	Testers seemed to prefer more visuals in the tutorial rather than text.
Tutorial needs some context about the teams	Limited knowledge about the conference teams might make it confusing to distinguish what you're supposed to slice or not so we will be adding some more information about it in the tutorial.
Clear indication that hearts/ruby are the lives	Tutorials will have some information about what Ruby/hearts are and how you lose them.
Make it clear that this is a highscore game	Testers seemed to have some confusion about how to win the game. This will be added in the tutorials.
Increased speed and difficulty	This was already the plan, and will be easier to implement digitally than on paper

Recommendations not to be Addressed (and Why)

More special effects	This may not be addressed due to the time constraints of adding additional functionality.

APPENDIX A. Session Script

Thank you so much for coming in today. My name is Bishakha. I will be the moderator today for this session. My teammates are Charles and Nrepesh. They will be observing and taking notes while you test.

I wanted to give you a little information about what you will be doing today and give you time to ask any questions you might have before we get started.

Today we are asking you to serve as a tester of a game. Our goal is to see how easy or difficult you find the game to use and to see what impact it has on you.

During this session, I would like you to **think aloud** as you work to complete the tasks. I will not be able to offer any suggestions or hints, but from time to time, I may ask you to clarify what you are doing or ask you for information on what you were looking for or what you expect to have happen.

The game you will be playing is a paper prototype. You may encounter difficulties while playing – if so, please ask us for directions or assistance. Also, there are no right or wrong ways to approach the game or play it.

Do you mind filling out this pre-survey before I introduce you to the game?

What is your age?
What is your gender?
Do you have prior experience with digital games and texting?
What is your race/ethnicity?

Thank you for completing that for me.

If you have any questions, comments or areas of confusion while you are working, please let me know. I may ask you other questions as we go and we will have wrap up questions at the end.

Do you have any questions before we begin?

<< tester will play game >>

Okay, thank you for playing our game. Now I have just a few follow-up questions for you. Again, please be as honest as possible so we can consider your feedback and improve our game.

APPENDIX B. Post-Test Survey

1. When this game is turned into a digital game, do you think it would be fun to play? Why or why not?
2. What did you like best about the game?
3. What did you like least about the game?
4. What suggestions would you have to improve it?

Sprint 2

Planning

Steps that need to be completed:

- Upload background art
- Upload the GUI
- Upload appropriate fonts
- Create Settings panel
- Create Credits Panel
- Create Tutorial Panel
- Create Title Screen
- Create Game Screen
- Add GUI actions
- Upload logos
- Turn everything into a prefab

How will it be completed

- Upload background art - Bishakha
- Upload the GUI- Nrepesh
- Upload appropriate fonts - Bishakha
- Create Settings panel - Nrepesh

- Create Credits Panel - Bishakha
- Create Tutorial Panel - Charles
- Create Title Screen - Nrepesh
- Create Game Screen- Bishakha
- Add GUI actions - Charles
- Upload logos - Nrepesh
- Turn everything into a prefab - Charles

How long will it take

- Upload background art - 15 minutes
- Upload the GUI- .25 hours
- Upload appropriate fonts - 15 minutes
- Create Settings panel - 1 hr
- Create Credits Panel - 30 minutes
- Create Tutorial Panel - 1 hr
- Create Title Screen - 2hrs
- Create Game Screen- 1 hour
- Add GUI actions - 30 mins
- Upload logos - 10 mins
- Turn everything into a prefab - 10 mins

Digital Prototype Game I Testing Plan and Report

1. Goals, objectives, and research questions

The goals of this study are to determine if Knox Kninja may be fun, engaging, and has good game balance for the targeted demographic, Knox students, alum, faculty, and staff. This is based on the paper prototype testing only.

The objectives of this study are to:

- Determine if the game play is fun and engaging for Knox students, alum, faculty, and staff
- Determine if the game play has good game balance for Knox students, alum, faculty, and staff
- Determine how usable the game is

Therefore, the primary research questions for this study are as follows:

- Do Knox students, alum, faculty, and staff find the game fun?
- Do Knox students, alum, faculty, and staff find the game engaging?
- Do Knox students, alum, faculty, and staff find the game usable?

The test plan and all of the test questions will be derived from these primary research questions.

2. Methodology

This study will be somewhat exploratory but will also gather assessment data about Knox Kninja. People in the targeted demographic will be tested. We will collect data about participants' experiences playing the game, their general observations and feelings about the game, their general understanding of conference competition, and more. Data will be collected in both quantitative and qualitative format. Once the data is collected, it will be summarized and a list of recommendations will be provided based on the player feedback.

2.1 Session outline, Session Scripts, and Timing

The session will be held in class (Period 3,4) and an extended period if our quota of 10 testers are not met. We will use a total of 5 minutes of each session for pre-test introductions and post-test debriefing interviews. The moderator will start by introducing the team members and talk about what the game is about. The moderator will ask for pre-survey questions and ask the tester to speak aloud his actions.

The tester will test the game as one of our team members will be noting down observations. We will ask the tester if they want to play the game again. We will ask the testers to answer a few post test questions and fill out a survey. Screening Questionnaires and Surveys/Interview Questions are attached in the Appendix.

Actions	Time Allotted	Description
Pre-test arrangements	1	The team will arrive a few minutes early. They will set up the game for the user to test it. Seating will all be arranged and any miscellaneous tasks (pens and paper for writing, etc.) will be in place. The device will be wiped with a hand sanitizer towel to avoid contamination of germs.
Introduction to the session	3	At this point, we will discuss the participant's age, gender, race and experience with gaming. We will explain who the moderator is and the other people in the room, and we will stress the importance of their involvement in the study. We will also ask them to inquire with us about any confusion. We will describe the protocol for the rest of the session. We will stress the importance of and encourage the participant to "think aloud."
Game Play	5	We will identify the tasks that we will have the participant perform and one of our team members will take notes of observation. If they lose the game, we will ask them if they want to play the game again.
Post-test Survey/Interview	2	We will first ask them a few qualitative post-test questions. We will then give them the post-test survey. (see appendix)
Post-test debriefing	1	We will follow up on any particular problems that came up for the participant and explain to them our initial intentions and what we plan to improve. We will make sure they leave the testing session feeling good about their contributions! And we will thank them for their participation.

3. Findings

The purpose of this paper prototype test was to answer the following questions:

- Do Knox students, alum, faculty, and staff find the game fun?
- Do Knox students, alum, faculty, and staff find the game engaging?
- Do Knox students, alum, faculty, and staff find the game usable?

3.1 Participant Summary

Demographic **Characteristic**	% of Target
AGE: 17 and above	100%
SEX: Male Female	 80% 20%
EXPERIENCE WITH TECHNOLOGY (Mobile device, web-based apps): Mobile apps (smartphones, tablets) Web-based apps (online, Internet, browser)	 100% 100%
EXPERIENCE WITH DIGITAL GAMES	100%
EXPERIENCE WITH TEXTING	100%
RACE/ETHNICITY (Knox demographics): White Hispanic or Latino Black or African American Asian Other	 40% 10% 0% 50% 0%

3.2 Did the testers find the game fun?

3.2.1 Qualitative feedback: Observations

Tester 4:

- Liked the explosions

Tester 9:

- Trajectory is the same

Tester 10:

- Hit knox logo, said oops
- Hard part was recognizing knox logo
- Combos would be cool

3.2.2 Qualitative feedback: Answers to Open-ended questions

1. What did you like best about the game?

Tester 1:

- The art/color combinations
- The sound worked well

Tester 2:

- The art style for sure
- Sounds was nice
- Good overall design
- Liked the concept

Tester 3:

- Liked swiping
- Liked the explosions

Tester 4:

- Liked the Knox design
- Liked the blaze explosion
- UI looked good

Tester 5:

- Liked the responsiveness
- Smooth
- Not clunky

Tester 6:

- Good pace
- Scoring

Tester 7:

- Good replica of fruit ninja

Tester 8:

- Cool lives
- Good speed
- Quit button worked

Tester 9:

- Solid
- Most things
- Looks like it goes together
- Easy controls
- Pick it up quickly
- Tutorial was up there, just didn't click on it
- Liked the life system

Tester 10:

- The music
- Wish trajectory would change
- Its amusing

2. What did you like least about the game?

Tester 1:

- Rush of game objects

- Did not understand the score
- Did not understand lose condition

Tester 2:

- The trail when clicking is annoying

Tester 3:

- The font. Just personal preference
- Not enough sounds
- Thought the trail was a bug on the swipe

Tester 4:

- Confused by the lives
- Thought the lives and the score were the same

Tester 5:

- Did not know why touching showed up on the swipe
- Wanted to exploit bug

Tester 6:

- Doesn't know
- Distractions in the background
- Make more opaque
- Sound effects
- Was not aware of the lives
- Audio for lives lost would help

Tester 7:

- Does the sound fit?
- Better with sound effects
- Fix the swipe bug

Tester 8:

- No comment
- Add new stuff

Tester 9:

- End game screen does not need quit button

Tester 10:

- Didn't know the other logos

3.2.3 Quantitative Feedback

For the purpose of this analysis, we divided the scale from 1-5 with 1 being Strongly Disagree and 5 being Strongly Agree.

The mean and standard deviation below are for items that correlate with the fun aspect of the game. The average for people who would like to play the game was 4.6 out of a scale of 5. The standard deviation of 0.49 tells us that most people agree with the mean of 4.6.

Similarly, ease of use, learning curve and confidence level of the game all received a mean of 4.70, 4.80 and 4.60 respectively with a standard deviation of 0.46, 0.40 and 0.49. From this

analysis we can conclude that our game was fairly easy to play and was fun for the group of testers.

One improvement aspect we understood from the data was the need for more instructions on how to play the game. The mean was 2.40 but the standard deviation was 1.11 so we think there was a big discrepancy on testers who needed more instructions and not.

Item	Mean (n=10)	Standard Deviation
I think that I would like to play this game.	4.60	0.49
I found the game to be unnecessarily complex.	1.50	0.50
I thought the game was easy to use.	4.70	0.46
I think that I would need more instructions to know how to play this game.	2.40	1.11
I would imagine that most people would learn to play this game very quickly.	4.80	0.40
I found the game very cumbersome to play.	1.40	0.66
I felt very confident playing the game.	4.60	0.49

3.2.4 Recommendations to make the game more fun

- Flew from different sides, which was nice
- Special effects
- Different modes, like a timed mode
- Reverse powerup?
- Make more harmful things

3.3 Did the testers find the game engaging?

3.3.1 Qualitative feedback: Observations

Tester 1:

- Hit high score first, expected something
- Read the tutorial
- Did not understand difference between Home and Quit on game over screen

Tester 2:

- Liked the art style

- Read the tutorial
- Hit the exit button
- Seemed to understand how to play the game
- Used the pause menu, wanted the options to work
- Did not notice logos falling off the screen or lives disappearing

Tester 3:

- Credits first
- Wanted something to happen on the high score button
- Read the tutorial
- Used the settings
- Did not realize why the game ended
- Replayed
- Hit the quit button instead of Home
- Did not notice the lives going down

Tester 4:

- Tutorial first
- Started fast
- Lives and points too close together
- Hit the quit button

Tester 5:

- Read the tutorial
- Noticed the clicking glitch
- Tried tapping the first time played
- Hit the Knox logo a few times

Tester 6:

- Read the tutorial
- Make upper lower case so its easier to read
- Rearrange, a bit smashed
- Hit the Knox logo first try
- Quit applications
- Kept accidentally hitting the Knox logo
- Didn’t realize the logos falling off the screen
- Small text
- Wants sound for when things fall off the screen

Tester 7:

- Didn’t understand the clicking
- Checked the panels
- Didn’t see lives
- Hit Knox logo

Tester 8:

- Read the tutorial but had to go back to it
- Hit the Knox logo
- Didn’t see the lives the first time but liked it when they did

Tester 9:

- Played pretty well
- Checked the credits and tutorial
- Seemed to know how to play
- Hard part seemed to be not hitting the knox logo
- Hit the quit button instead of home
- Didn't realize the lives until they let things fall

Tester 10:

- Likes soundtrack
- Didn't need tutorial
- Display score
- Background is cool
- Thought that high score was a button

3.3.2 Answers to Open-ended questions

3. What do you like best about the art?

   Tester 1:
   - Liked the theme with background and buttons
   - Logos fit a good theme

   Tester 2:
   - The logos were nice for the art.

   Tester 3:
   - Logos looked sharp

   Tester 4:
   - Everything looked like it fit together
   - Sports theme was consistent

   Tester 5:
   - Liked the particle effect, looked cool

   Tester 6:
   - Consistent

   Tester 7:
   - Logos look good, no pixelation

   Tester 8:
   - It was fine
   - Liked the L's

   Tester 9:
   - Looked positive and smooth

   Tester 10:
   - User friendly
   - Not too small
   - Easy to read
   - Colors look good together

- Likes the green

4. What do you like least about the art?

   Tester 1:
   - The green color
   - Swipe should not be green either

   Tester 2:
   - Nothing, it was perfect

   Tester 3:
   - Just the font, nothing about the art

   Tester 4:
   - No comment

   Tester 5:
   - Particle effect is too big

   Tester 6
   - MWC logo
   - Visual effects for scores

   Tester 7:
   - No comment

   Tester 8:
   - Explosion goes too far

   Tester 9:
   - Tutorial screen needs to be resized

   Tester 10:
   - Why basketball court? No affiliation

5. What do you like best about the sound/music (if any)?

   Tester 1:
   - Mellow

   Tester 2:
   - Minimalist
   - Fit the style

   Tester 3:
   - No comment

   Tester 4:
   - Liked the simple sound

   Tester 5:
   - No comment

   Tester 6:
   - Background music was fine
   - Sound effects for score

   Tester 7:
   - Was not sure about it yet

   Tester 8:
   - Liked the music

Tester 9:

- Liked the music

Tester 10:

- It's so bouncy and amusing
- It was funny, better than other games

6. What do you like least about the sound/music (if any)?

Tester 1:

- No complaints

Tester 2:

- Sound effects could be cool
- Sounds were fine

Tester 3:

- Wanted more sound effects

Tester 4:

- Could have been more engaging
- Too slow

Tester 5:

- Sounds would get annoying
- Switch music based on score or something
- Maybe more sound effects

Tester 6:

- It was fine

Tester 7:

- Didn't know about the music
- More sound effects
- Maybe background only during title

Tester 8:

- Nothing

Tester 9:

- Wants sounds for cutting
- Two differents tracks for playing or home screen

Tester 10:

- No comment
-

7. What do you think about the difficulty?

Tester 4:

- The hard part was telling the difference between the logos, which is fine.

Tester 5:

- Its easy
- Did not notice what happened when things fell off the screen

Tester 6:

- Difficulty was good

- Easy, laid back
- Make more difference in speed

Tester 7:

- Make it get harder
- It was fine
- Did not notice the lives

Tester 8:

- It was good for the beginning, could get harder

Tester 9:

- Average difficulty
- Vary the spawn rates, would be fun to have groupings

Tester 10:

- Wish there were different levels
- Did not realize the health bar

3.3.3 Quantitative Feedback

For the purpose of this analysis, we divided the scale from 1-5 with 1 being Strongly Disagree and 5 being Strongly Agree.
The mean and standard deviation below are for items that correlate with the engagement aspect of the game.

The results for User Interface were very positive, with positively framed questions concerning the art averaging 4.6 or above, and negatively framed questions at 1.5. This shows that our visuals were positive, and the low standard deviations imply much agreement.

Positive feedback was also received on the easiness to pick up the game. This is a dramatic positive change from our last testing, as it shows things were more intuitive. Much of this was likely from the labeling and priority spot of the tutorial button.

The item of most contention was the music. The mean score of 3.8 was by far our lowest, and the standard deviation of .75 shows that it was the most contentious. Why these scores differed from the background music is a bit confounding, as the background music was the only added sound, but the mean of 4 and largest standard deviation of 1.18 shows that some people loved the background music while others did not. How to balance the differing preferences will be something to consider.

Item	Mean (n=10)	Standard Deviation
I found the user interface was well integrated with the game.	4.60	0.49
I thought that was was too much inconsistency with the user interface.	1.50	0.50

I needed to learn a lot of things before I could start playing this game.	1.50	0.50
I felt the art was very consistent across the game.	4.60	0.49
I liked the art.	4.70	0.46
(If sound) I felt the background music went well with the game.	4.00	1.18
(If sound) I felt the sound effects went well with the game.	N/A	N/A
I liked the sound.	3.80	0.75

3.3.4 Recommendations to make the game more engaging

- Green color was ugly
- Finish the menu for game over and pause
- Just fix the “bug” of the trail
- Did not know why the game ended
- Fix the swipe bug
- Tutorial should talk about lives
- Score and lives too close
- Music could be more of a banger
- Score is fine, but lives are not obvious
- Have to lose too many things before seeing the flame
- Did not notice the lives
- Make harder
- Only lose condition is hitting the Knox logo maybe.
- Use score for things falling off
- Maybe knox takes points rather than instant loss
- Trajectory
- Slash noise (sad music for loss, cheering for hit)
- Finish menus and button actions and high score

3.4 Recommendations

A recurring theme is the awareness of the lives system. The loss of life was not obvious, and was too close to the score counter. While there are a few ways to address this, it at least needs to be mentioned in the tutorial, and preferably more obvious to the eye.

Several testers noticed a bug on our swipe mechanic, where clicking still activates the swipe.

The Home and Pause panels are not quite complete. We do not have a working replay button, and the game over screen does not need a quit button that closes the application. The options button on the pause menu does not work either.

A few testers attempted to use the highscore indicator as a button, so that feature must be made more clear to users and look less like a button.

Other features were suggested, such as combo's special abilities, more harmful to touch objects, sound effects, and modes.

Future Versions and Prototype II:

All of these issues could be addressed in future versions, and several of them will be addressed in Prototype II. The separation of the lives and the scores will absolutely be implemented, along with a better, hopefully more integrated, tutorial.

Menus will also be made to work, we hope to have a better replay button and remove the Quit button from the game over screen. The options button on the pause menu will either be made to work or removed.

Sound effects and a highscore implementation will also be added.

Combo's and different modes will likely not be implemented by Prototype II. The swipe bug will hopefully be fixed by prototype II, but it is lower on the priority list.

APPENDIX A: Testing Session Script

Thank you so much for coming in today. My name is Bishakha. I will be the moderator today for this session. My teammates are Charles and Nrepesh. They will be observing and taking notes while you test.

I wanted to give you a little information about what you will be doing today and give you time to ask any questions you might have before we get started.

Today we are asking you to serve as a tester of a game. Our goal is to see how easy or difficult you find the game to use and to see what impact it has on you.

During this session, I would like you to **think aloud** as you work to complete the tasks. I will not be able to offer any suggestions or hints, but from time to time, I may ask you to clarify what you are doing or ask you for information on what you were looking for or what you expect to have happen.

The game you will be playing is a paper prototype. You may encounter difficulties while playing – if so, please ask us for direction or assistance. Also, there are no right or wrong ways to approach the game or play it.

Do you mind answering some demographic questions before I introduce you to the game?

<< Ask the pre-survey questions to the tester >>

Thank you for completing that for me. Do you have any questions before we begin?

<< tester will play game >>

Okay, thank you for playing our game. Now I have just a few follow-up questions for you. Again, please be as honest as possible so we can consider your feedback and improve our game.

APPENDIX B: Demographic Questions

What is your age?

What is your race?

Do you have any experience with digital games?

APPENDIX C: Post-Test Survey

<< These questions should be given to the tester to complete by the moderator. This data is part of your quantitative sections above. This is adapted from the System Usability Scale. >>

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I think that I would like to play this game.					
I found the game to be unnecessarily complex.					
I thought the game was easy to use.					
I think that I would need more instructions to know how to play this game.					
I found the user interface was well integrated with the game.					
I thought that was was too much inconsistency with the user					

interface.					
I would imagine that most people would learn to play this game very quickly.					
I found the game very cumbersome to play.					
I felt very confident playing the game.					
I needed to learn a lot of things before I could start playing this game.					
I felt the art was very consistent across the game.					
I liked the art.					
(If sound) I felt the background music went well with the game.					
(If sound) I felt the sound effects went well with the game.					
I liked the sound.					

<< These questions should be ASKED VERBALLY by the moderator. This data is part of your qualitative data. >>

1. What did you like best about the game?
2. What did you like least about the game?
3. What did you like best about the art?
4. What did you like least about the art?
5. What did you like best about the music/sounds?
6. What did you like least about the music/sounds?
7. What suggestions would you have to improve this game?
8. What are your thoughts on the difficulty of the game?

Sprint 2 Review

What went well

Our prototype one testing had very positive reviews, and we feel good about our progress with respect to the rest of the class. We have almost all of the major functionality

working, and are confident in our ability to finish the game with required pieces. User comments were very helpful to make the game experience better. We were able to continue working together efficiently and effectively, and have made time to work in person when necessary. We were able to put out a relatively professional and complete game for our testing, which was playable on a mobile platform. We look forward to continuing this success.

What did not go well

We had some issues with changing the platform to Android. The anchoring was off and a lot of UI elements needed fixing. Camera and layering issues were causing the explosions to appear behind the background image. Because of all these last minute fixings we had to make a few compromises to get our game working for Prototype One testing. That included pause function being connected to the activation of the pause panel, which caused some other issues on the Gamescreen.

How will we improve in the future

We plan to anchor our objects as soon as we place them on the game screen. This hopefully will make it easier for us to build the game on android. We also will have to rewrite some of our functionality in order to increase scalability. Some shortcuts will not work for a larger and more efficient game.

Sprint 3 Planning

We hope to add an effective replay button that will increase the user's engagement with our game. We have also begun work on making our display easier to understand, as well as our tutorial more thorough.

What needs to be completed

- Replay Button
- Distinction for lives and score
- Better tutorial
- Special Effects
- Retain highscore
- Beautify (more effects increased difficulty)
- Fix blade bugs and beautify
- Score in game over panel

How will we complete these tasks

- Replay Button - All of us but hopefully Charles
- Distinction for lives and score - Nrepesh

- Better tutorial - Charles
- Special Effects - Bishakha
- High Score Platform - Charles
- Retain highscore - Nrepesh
- Beautify (more effects increased difficulty) - All of us
- Fix blade bugs and beautify - Nrepesh
- Score in game over panel - Charles

How long will it take

- Replay Button - Probably a long time
- Distinction for lives and score - 30 minutes
- Better tutorial - 30 minutes
- Special Effects - 2.5 hours
- Add highscore platform - 30 minutes
- Retain highscore - 1.5 hours
- Beautify (more effects increased difficulty) - 1 hour
- Fix blade bugs and beautify - 1.5 hours
- Score in game over panel - 30 minutes

Sprint 3 Stand Up Meeting

What have you done since the last daily standup meeting?

Charles: I worked on the game over panel, keeping track of the score, deleting logos that fell off the screen, special effects, and other tasks as required. I assisted with the testing of prototype one and worked collaboratively with my team in order to finish the testing report with actionable advice and feedback. Since the testing report, I have edited the pause menu so that all buttons work, displayed the score on the game over panel, assisted with the highscore being displayed, made the tutorial more clear and better formatted, and worked on attempting to make the replay button work.

Bishakha: I worked on making the Pause button work and resuming the game properly. I also worked on spawning the logos on screen. I also assisted with fixing the UI elements on Tutorial, credits and title screen. We worked together on deploying the game to Android platform and fixing the issues that came up during that. I also moderated the Prototype One testing and worked on the calculations for the report.

Nrepesh: Most decision making sections and changes were conducted as a team and reviewed. Individually, I added the blade cutting trail renderer and scripts associated with it. Added sound to the game and a quit function. Added lives to the gameplay. The build to the android platform was done as a team.

What will you be doing between now and the next standup meeting?

Charles: I will try to complete the replay button and assist with making the game progressively harder, as well as add more effects or elements.

Bishakha: I will be working on making the game progressively harder and adding the sound effects.

Nrepesh: Fixing bugs with the blade, adding highscore and an effect of flame going off.

Is there anything standing in your way?

Charles: Inability to use unity, and confusion over the one-time use of logo spawners.

Bishakha: I have been struggling to find the sound effect that matches our game theme without being too distracting.

Nrepesh: The more game mechanics we try to add it is harder to build off of the previous work.

Sprint 3 Stand-Up Reports

February 19, 2020

What have you done since the last stand-up meeting?

Charles: I worked on strategies for retaining the high score and the replay functionality that was eventually added to in order to work correctly. I also changed the tutorial to be more readable and clear, and added the score to the game over panel so that people could see what score they got.

Bishakha: I worked on adding the sound effects for the game, worked on increasing the level of difficulty over time, added different spawn points for bonus logos. I also gave a shot at fixing the replay mechanism.

Nrepesh: I worked on the high score display, fixing the glitch and making the blade look better. I also worked on restarting the game panel after the restart button was clicked. I added particle effects on the lives going out.

What will you do between now and the next stand-up meeting?

Charles: There are a variety of tasks to work on, including keeping settings persistent, adding an option to turn off sound effects, changing the difficulty, etc. I will also assist with any testing that is necessary.

Bishakha: I will work on decreasing the spawn rate in the beginning of the game and slowly increasing it so that the game play time is more. I will also work on adding and randomizing the spawning of the logos.

Nrepesh: I will be working on effects of the lives and some sound effects. Commenting the code. Helping the team to build the game and testing it for Prototype 2 testing.

What are the obstacles standing in your way?

Charles: Physics is currently tied to the logo rather than the spawner, so this may be challenging. We may also have to work inside of player preferences in order to retain settings.

Bishakha: Managing the projectile of logos from different spawn points might be difficult.

Nrepesh: Things should work out after trial and error.

Team Postmortem for Knox Kninja

Purpose[1]

The purpose of a postmortem is to "learn from past experience." This is accomplished through careful analysis of a project once it has ended. As a team and as individuals on the team, you identify what went well and what went poorly so you can do better on subsequent projects. The postmortem also gives closure to a project. Closure is important for team members who are breaking away and moving to different projects, or to wrap up a particularly long or tough project cycle (sense of completion).

A postmortem should occur within 1-2 weeks of project completion. Smaller postmortems can be conducted following completion of any major milestone during the project cycle. If you conduct the postmortem too soon, people may not be done wrapping up loose ends.

This document contains your team's postmortem. For full credit, you must fill out all sections as a team.

[1] The postmortem template has been derived from http://www.wintestgear.com/templates.html, which offers free tips and tools for use.

For each section, answer the questions in a narrative (paragraph) form. You may need more than one paragraph per section. I'm looking for in-depth analysis showing that you and your team have considered the questions and reflected back on how you can improve the process for your next project. Each question should reflect different issues/concerns. And since there is always room for improvement, all answers should be specific and complete, with little repetition.

Please pay attention to grammar, spelling, comprehensiveness, and narrative. This is a chance for your team to tell your teams journey through the project.

PLEASE ANSWER IN AN ESSAY FORMAT. Paragraphs and full sentences are required.

Project Metrics (Quantity)

Programming:
Scripts: 19
Lines of Code: 1118

Art Assets:
 # 3D Assets: 0
 # 2D Assets: 83
 # Other (specify—such as fonts):
- **Fonts: 4**

Sound Assets:
 # Background Music Files (assets procured): 1
 # SFX Files (assets procured): 5

	Estimated Hours (Refer back to your design document)	Actual Hours (Estimate time actually spent)
Sprint 1	21.25	35
Sprint 2	27.5	40
Sprint 3	10	10
Total	58.75	85

Project Challenges

- **What were your team goals for your project?**

As a team, we wanted to create a fun, engaging, and visually appealing game that would be appreciated by our target demographic (Knox students).This required us to take the time to find great GUI and sound effects that we could pair with solid visual elements. In addition, we needed to create engaging and functional gameplay for users.

As programmers, we also hoped to gain a better understanding of what collaborative projects looked like and how to use version control in a professional environment. We hoped to become better at working in teams, communicating, and assisting each other.

Finally, we hoped to gain experience with the process of game development and Unity. We wanted to gain exposure to new areas of focus and creation beyond programming, and to learn about how visuals and auditory additions change the users experience.

- **What were the three most prominent challenges your team encountered while designing and developing your project? For each, explain how you addressed/overcame those challenges and, if you encountered these again in the future, how would you address them.**

Even though we had a somewhat clear idea of the functionality we wanted in the game, lack of familiarity with Unity resulted in some difficulty implementing those ideas. We spent a lot of time trying to understand how to approach and tackle the problems we faced by researching the issues online and trying to fix them. We also assisted each other and sat down to solve problems if anybody needed help. If we encountered this kind of problem again, we would try to do thorough research to approach the problem individually and come together as a group to fix those if needed.

Another challenge was our lack of knowledge in using version control and GitKraken. In the beginning of the project, we had many merge conflicts. We spent a lot of time trying to understand what were causing those conflicts, in addition to learning about different functions like Stash, Undo and so on. Because we took time to understand this early on, we were able to fix any issues that arose later in the project. If we were to encounter this again, we would try to understand what were causing those conflicts and which parts to pick in order to get the changes and not have any conflicts.

Not having worked on a big project before, we faced some difficulty involving the planning of this project. We were brainstorming and adding the ideas into the design document that seemed appropriate. But as we started building the game, we had to go back and change some elements that didn't work for us. This led to a lot of unexpected changes and required a lot of adaptation. From this experience, we learned to keep our

ideas and approach flexible in case of changes and problems that we had not anticipated.

Scope, Time, and Resources

- **For each of the differences in the estimation of hours versus actual hours spent on the project, explain the differences. What did your team learn about estimating the amount of time needed to complete a project?**

The difference in hours largely resulted from tasks we did not anticipate. Most of the areas which we expected to be the most challenging did not turn out to be the most time intensive. In the design document, we did not prepare for the time intensive process of writing the testing reports and preparing our game for being played on mobile, despite these being some of our largest tasks. In addition, small features such as freezing items after hitting the pause button, retaining the high score, and implementing a replay button took a disproportionate amount of time.

What is interesting to us is how close our estimates still were in terms of actual game creation. We estimate that the time spent on truly creating the game, which is all we prepared for in our initial estimates of the design document, were actually very close to the actual hours. The tasks, of course, were completely different. Small issues or features were much harder to implement than we anticipated, while much of the major gameplay was less challenging than we prepared for. This evened out to our estimate.

However, as mentioned, we were not prepared for the extra processes we were not aware of. This is largely due to them being omitted in the design document template, as well as our unfamiliarity with the overhead of these projects. These extra tasks added much time to our actual work.

- **What were the three most important aspects of resource planning that your team learned through this process?**

Our success as a team relied heavily on resource planning, and we spent the majority of our time planning. The three important resource planning aspects we used are as follows. Firstly, our brainstorming phase really helped us collect ideas and create a paper prototype which we later imitated for our actual game. This helped us replace ideas without a single line of code.

Secondly, Charles was our configuration manager, who really saved us from merge conflicts. We communicated with each other to merge branches and finally merge to our master branch. We planned to merge large changes together so we could resolve the conflicts together.

Finally, our task delegation in unity helped us build off of one another's work. This really accelerated our process of building the game. We estimated the time required for each task which we delegated to one another.

- **What were the three most important aspects of time management that your team learned through this process?**

Much of our ability to create a final product we were proud of came due to successful time management on an individual and team level.

From the very beginning, our team made sure to delegate tasks to the person most competent for that specific task. This process was aided by complementary talents. During the design document, we tried to give serious thought towards who would be most capable of completing different tasks, while also trying to balance time appropriately. This resulted in each person being able to do their best work, and where each member could be an authority on their area of work.

In addition, early proactivity was vital. We all had more time to work at the beginning of the term, and our fast work from the beginning allowed us to get ahead when it mattered most. This also had the massive benefit of allowing us to add the smaller pieces of our game that make our game more fun and engaging, and closer to a professional development. By completing the bigger tasks as early as possible, we were able to refine our work and give thought to the details.

Thirdly, meeting in person was crucial to our success. We did much of our best work while together, as we were all able to answer questions about our own work, contribute to others work with complete understanding of it, make executive decisions, and resolve any issues with immediate communication. All testing reports and prototype builds were done in person, which resulted in more efficient work, and all important problems were resolved together.

- **What were the three most important aspects of scope that your team learned through this process?**

The game development process went fairly smoothly due to our planning and implementation of scope. Firstly, we planned game components and mechanism in a priority governed manner. This helped us work on more important aspects of the game first.

Secondly, we started off with an effective skeleton framework. We had a very good foundation to start with, which really helped us build off of the skeleton canvas settings. We really worked hard to get the minimum viable product up and running for the first prototype. This really helped up create new features in our next prototype.

Finally, we optimized the game concepts and mechanics to fit what would be best for the user. From our testing result we realized that users did not read the tutorial, so we implemented a threshold for the user so that they are prompted with a tutorial when the play button was clicked.

Sprint Processes

- **In what ways did the SCRUM/Agile processes aid in your project success, if at all? If it did not help, why not? Consider the Sprint Planning, Sprint Review, and Sprint Retrospective.**

The SCRUM/Agile process had a few benefits for our team. The project initially seemed very daunting, but the three sprints allowed us to organize our goals and make positive developments every week. The categorization of tasks ensured that we made progress on the most important tasks, and we were able to complete tasks according to their priority while still keeping track of all future modifications using Glo Boards as a product backlog.

That being said, a few of the principles of SCRUM were not useful for our team, mostly due to our setting. As a team, we were only guaranteed to see each other twice a week, and many of these days we did not have appropriate time to perform a standup meeting or reflect on our work. This project was also small enough that many of the developments could be kept track of, so some of the organizing principles were not necessary. Were we to be in a more professional setting, where this was our only task, the SCRUM process may have been even more beneficial.

- **What were the three most important aspects of the SCRUM/Agile processes for your project?**

We spent a significant amount of time planning the project, including finer details. Having these ideas and intended approach documented in our design document was very helpful for us throughout the process. We were able to refer back to the document whenever we needed to revisit the ideas and details.

We kept an updated product backlog in our Glo board. We had all of our tasks added to the Glo board and assigned each of the members to each task. This ensured an even distribution of task and clarity on each of our responsibilities for each sprint.

Instead of aiming for a bigger and more complex game in the beginning, having multiple sprints allowed us to work on deliverable products for each sprint. This allowed us to improve specific aspects of our game based on the game testing and feedback.

Communication

- **Describe the general protocols your team established for sharing information on #Slack and gitKraken Glo Boards? Was it kept up to date and was it effective in helping your team manage the project? Why or why not?**

    The project was small enough that Slack and gitKraken were not vital, but were important to the organization of our project. We were able to communicate almost all needed information in person, including setting up future meetings and determining next steps.

    Our team established no protocols for Slack; it was used as necessary. As we became more familiar and comfortable working in a team, our use of slack decreased. This was aided by the fact that notifications were not always on each others phones, so it was easier to communicate in person. By the end of the term, we largely used it only as a platform for sharing the downloads of the game.

    GitKraken was much more useful. We were forced to self-teach the version control aspect of things, but the visual presentation was helpful for us. The Glo Boards did not feel vital, but they helped us list our tasks and give priority to them. Due to our use of the Glo Board as a way to jot down future tasks, we did not update them constantly. Instead, we usually updated them at the end of every meeting, and added any new tasks with assignment when we were together. They were not important to our communication, so it was not necessary that it be relied on.

- **What were the three primary challenges with communication among team members? (Answer honestly.) How did you mitigate those challenges (or did you)?**

    We faced some difficulties and merge conflicts on GitKraken because our branches were on different timelines. Lack of communication about each commit and merge occasionally led us to be on different versions of projects.

    Slack was not very helpful with communication within our group as we weren't getting instant notifications on our devices. We had to switch to Messenger as our primary mode of communication in order to stay updated and on top of the changes.

    One of main issues we had to face during our project was to get the replay button to work. At the moment it was our primary focus and we were all trying to give our shot at it. This led us all to spend more time on the same thing when we could have been working on other things that needed attention.

- **What were the three most important aspects regarding communication that your team learned as a result of this project?**

    We consider communication as key for our success. The three communication aspects we used were as follows. Firstly, most decisions were made in person and we tried to merge big tasks when we met as a group.

    Secondly, we communicated heavily on slack/messenger which really gave us an idea what team members were working on and ask for help when we had difficulties with the process.

Finally, we did a very good job on pre-delegating tasks and all components associated with it. For example, if someone was working on the blade then they would take care of the script, animation and functionality as a whole. This reduced a lot of moving parts for us.

Team / Organization

- **What were the three primary issues with teamwork or morale? What did your team do to overcome those issues?**

At the beginning of the term, the project seemed incredibly daunting due to our lack of experience with Unity. Most of us had very little experience with Unity, and did not know how easy it would be to create a project we had never done before. To combat this, we trusted the process. We knew there were seven other teams, and trusted that, as long we continued to meet deadlines, we would be able to create a solid game by the end of the term.

Additionally, the whole process of version control was very confusing, and we had no idea how the process was going to work after our exposure to gitKraken in class. In order to alleviate our concerns and ensure we could work well together, we scheduled a meeting the next day where we discussed strategies, played around with what we could do, how to navigate and undo changes, and determine what caused merge conflicts and how we could resolve them.

Finally, getting stuck on issues is extremely frustrating. In order to prevent teammates from being stuck on bugs and not knowing a way forward, we created a team dynamic that encouraged constant and positive communication. By working in person as much as possible, we were able to solve our issues together and ensure that everyone was able to contribute meaningfully and get the assistance they needed on the issues they had run into.

- **What were the three most important aspects of team organization and structure your team learned as a result of this project?**

From the very beginning of our project, we had our roles assigned for each task based on our strengths and weaknesses. This worked very well for us as a team as we were able to make progress on multiple tasks at the same time. As a result of this structure, we had a fairly well functioning game from the very first Prototype. We learned to recognize each other's strengths and weaknesses and work according to that.

We were very diligent about updating our progress with the team. This worked well for us when we needed to work on the same scene and needed to get the updates before making more changes. Comments on the code and in person briefing of our progress during stand up meetings helped us get a better hold of all the changes in the game. We learned that effective communication can make a lot of difference in the team performance.

We all had slightly different versions of the game in our minds when we were working on our design document. But once we started building the paper prototype, we came together as a team to make decisions that were better for the team by making compromises when needed. We learned to respect each other's ideas while putting the game functionality above our individual preferences for the better functioning of the game and as a team.

General and Words of Wisdom

- **List the three top things that went well during your project. Explain each.**

Our team was extremely fortunate with how well we worked together and how complementary our skills were. While this was largely out of our control, this ability to assist each other in order to make a complete and well rounded final project was extremely important.

We also set off on the right foot by taking the planning phase extremely seriously. Before our design document was finished, we had already decided on what GUI we would use, the background image we would use, the fonts we would use, the background music we would use, and a complete vision for the game. By having a fully formed vision, and all the elements we needed, we were able to apply this to the final game with ease.

Finally, we delegated tasks according to skills and interests. This allowed our team to do work that we were all passionate about while still getting all tasks completed. This also reduced conflicts of any kind, as we were all responsible for different areas.

- **List the three top things that did not go well during your project. For each, suggest how your team would do things differently to mitigate those problems if you could do it again.**

The first thing we struggled with was familiarity with Unity. In order to resolve this in the future, it would have been helpful for the most experienced team members to ensure that newer members were comfortable with how to organize the project rather than uncover problems as we went.

Version control was also an issue. None of us understood how gitKraken worked, and we all had misconceptions concerning merge conflicts and resolution. I do not believe we could have resolved this issue any better than we did. We made sure to get together to experiment and uncover issues. That being said, better communication over which parts of the scene were getting changed would have avoided a few annoying merge resolutions.

Finally, the planning of the project was difficult due to our lack of experience with a project of this scope. While we had strong planning for much of the game elements, we were unprepared to plan for the tasks such as testing reports and deploying. By spending more time working with the software and in larger projects, we would become more prepared to plan for these developments.

- **Consider any other ways in which your team would do things differently if you had the project to redo. What would you do differently that hasn't been mentioned above?**

We realized that we were getting a lot of layering issues so we changed the camera settings midway while developing the game. The camera fix reduced our layering issues by 90% which saved us a lot of time to work on other tasks.

Finally, we could have spent more time ensuring that we were tracking our time and considering the tasks we might have to complete. Using the Google classroom early on to look at each of the tasks we would have would have provided better estimates for what work we still had to do. We also could have kept better track of our hours.

- **Based on your experiences, provide a list of 5 statements/words of wisdom that you can confidently pass on to future students to help ensure them to succeed with their CS 292 project.**

Dream team: Make a strong team with complementary talents
Game should work before you create it: Make sure you have a clear vision of functionality
Work in person when possible: This makes work much faster and efficient
If you're not ahead, you're behind: Things move quickly and you have to stay up to date
0 people per task is better than too many: Too many people working on a task creates merge conflicts and problems
Bonus: Don't make a game with squirrels