**Unit 77**

Assignment 1 – Theory-Design & Implementation of Games Testing



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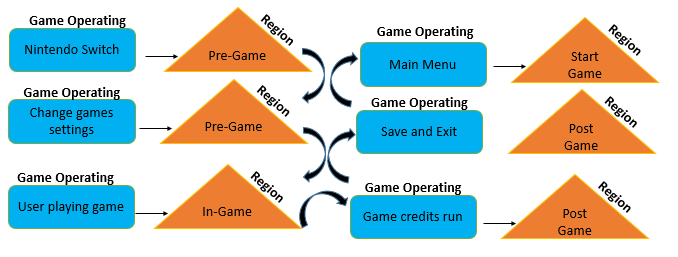
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# Game Operating Regions

|  |  |
| --- | --- |
| Game Operating Regions | Explanation |
| Pre-Game  [Image result for insert disk](https://askleo.com/i_dont_have_installation_media_for_windows_what_if_i_need_it/)[Image result for game loading](https://www.gamespot.com/forums/system-wars-314159282/what-is-or-war-your-favorite-video-game-loading-sc-31644398/) | The pre-game region is the time when you insert the game disk or when you are waiting for your game to launch.  An example of a bug that could happen during the loading screen is that if you have any mods installed on your game and one of them is out of date or broken it could crash your game when booting up. This is a software bug.  A good example of a hardware issue during the pre-game region is that your disk could have a scratch on making it so that the disk reader inside your system can not read it properly causing the game to crash. |
| Game Start  [Image result for smash 4 menuscreen](https://gamebanana.com/guis/31724) | The game start region is the period when the title screen is showed and the user can go to the options menu and do various other tasks, such as starting a game this could also be the time when a tutorial is played.  An example of a software bug could be that the controller’s button layout is wrong so when you press “A” it actually goes back rather than forward.  An example of a hardware issue you could have is that the controller doesn’t input anything when you press a button or |
| In-Game  [Image result for smash 4 in game](https://www.redbull.com/us-en/why-melee-and-smash-4-don%E2%80%99t-have-to-compete) | The in-game period is when the player is actually playing the game and hopefully having fun.  A software issue you could have in this region is the game freezing from something not loading properly making the game unplayable until you restart the game or your system.  A hardware issue you could have while in the in-game period is the disk failing to load on your system because it may have a scratch on the disk. |
| Post-Game  [Image result for persona 5 saving game](http://www.player.one/persona-5-review-golden-age-jrpg-modern-era-116294) | The post-game region is the time period while the player is saving and turning off his game.  An example of a software bug in the post-game region is that the game could freeze while trying to save the game to your computer causing you to lose the progress you just made.  An example of a hardware issue you could have while saving your game so that you can exit it is that your computer could not have enough memory for your save causing the game to crash. |

# Game Operating Regions Diagram



# Game Test Defects

## Documentation Defect

A documentation defect is basically a bug with consists of fixed data for example this could be a misspelled piece of text within the game, as you can tell from the example a documentation defect is usually based on human error. Another example could be with a characters voice lines being muffled because the microphone wasn’t set up correctly. The consequences of this is that when a player starts to pay attention when playing the game he will start to see lots of errors and think of the game poorly as they couldn’t even spell something correctly.

## Function Defect

A function defect is basically when a sequence of events is broken leading to the result not showing, for example if in a game in order to open a door I had to push two buttons however when I push the two buttons the door doesn’t open because a bug in the games code is preventing the sequence from taking effect. The consequence of this is that the player won’t be able to progress through the game.

## Assignment/Checking Defect

An assignment defect is purely down to human error as it is basically when certain variables don’t match up resulting in perhaps a gun shooting sound effect going off when you throw a grenade. This could also happen from interface numbers and values don’t match so if I pick up 2 coins it will say in my inventory that I have 4 although I can only spend 2.

## Timing Defect

This can be any bug that has to do with the time value being offset for example if I shoot a gun the bullet sound effect will have a delay or if I press “A” to open a chest and the object opens 5 seconds after. Timing defects usually are caused sue to the system running the game being overwhelmed so non important tasks like playing a sound get delayed. Whereas if this is an online game that has a timing defect it could be from low quality servers or a bad internet connection as well as just the system being overwhelmed.

## Algorithm Defect

There are many bugs under the algorithm defect category, I will be talking about three:

### Z Fighting

Z fighting is when two objects that are meant to be solid in the game suddenly phase through each other like how in almost every game the characters clothing will go through a wall when standing up against it.

### LOD Popping

LOD popping is when in a game the further away you are from an object the less detailed the objects texture will be as to make the game seem more realistic as it acts like a human eye and also to save processing power. However, the defect with this is that the distance between the objects texture from being blurry to highly detailed is drastically short, meaning that in a game you could look at a house walk ten steps back and then all you can see is an outline of the house.

### Graphical Glitch

A graphical glitch could be something as simple as the wrong texture being on an object for example the skin of a brick wall being on a chair, this is a simple problem to fix as all you have to do is change a couple of variables to match them up.

# Game Defect Triggers

|  |  |  |  |
| --- | --- | --- | --- |
| Trigger | Where can be found  (Pre-Game/Start Game/In-game/Post-Game) | What could generate the Trigger? | Example/Image |
| Configuration Trigger | Game Start/In-Game | Changing in game settings. | In Call of Duty: Modern Warfare if you go into the graphical settings of the game and turn off anti-aliasing it can cause objects and textures to disappear in the game. See with this it madee the texture for the crate to dissapear. |
| Start-up Trigger | Game Start | Disk reading issue or lack of processing power and memory. | [Image result for wii disk reading error](https://www.lifewire.com/what-can-i-do-if-my-wii-cant-read-a-disk-2498308) |
| Exception Trigger | Pre-Game | This can be triggered when loading up a game, when it cannot read certain code usually ending up in the game crashing. | The most-likely cause of this is when a player adds mods to enhance their player experience however they are out of date meaning the game cannot read the code as the variables don’t match up. [https://steamuserimages-a.akamaihd.net/ugc/912421431244811538/6C73C9D95F10147934C4F07CA7CBD9A4B2B6CA12/?interpolation=lanczos-none&output-format=jpeg&output-quality=95&fit=inside%7C1024%3A576&composite-to=*,*%7C1024%3A576&background-color=black](https://steamcommunity.com/sharedfiles/filedetails/?id=1388165695) |
| Stress Trigger | In-Game | This is usually triggered when too many people are playing an online game causing the servers running the game too overload. | This happened with the launch of Grand Theft Auto V (5) as too many people were playing the games the servers were overloaded causing the game to kick people out of the game and in general stop people from playing the game online. This went on for weeks as Rockstar the creators weren’t expecting so many people to buy and play their game so they didn’t have massive servers at the ready to handle the player load, they eventually got more server and fans could finally enjoy the game  without the risk of the server crashing.  [Image result for gta 5 servers down](https://www.youtube.com/watch?v=q6jiHm23E_s) |
| Normal Trigger | Pre-Game | This trigger is usually caused by user error on a hardware standpoint. | For example, if the user’s computer isn’t powerful enough to handle the games graphics causing the frame rate to drop or the game to crash.  [Image result for game crashing](http://enbseries.enbdev.com/forum/viewtopic.php?f=28&t=1780) |
| Restart Trigger | Pre-Game | This trigger is usually occurs when loading up certain bits a games data that could be wrong. | This data that is stopping the game from loading up properly could have been altered from a glitch caused be the game being restarted constantly or the power going off randomly. This has happened to me be before while trying to save a game the power in my house turned off causing my game to not save correctly resulting in my save file becoming corrupted.  Image result for corrupted save file ps4 |

# Game Test Phases

|  |  |
| --- | --- |
| Phase | Explanation of the characteristics (Provide examples wherever possible) |
| 1 – Preparation | During this phase testers will play the game to see if all the basic functions of the game work such as the character moving and jumping. |
| 2 – Alpha | The alpha phase of a games lifespan is about making sure the games simple mechanics run making it technically playable. Many bugs will be found and reported in this stage such as graphical and collision glitches. |
| 3 – Beta | When a game makes it to the beta stage it should be almost complete with most of the game breaking bugs fixed just leaving a couple minor glitches mainly graphical. |
| 4 – Gold | The gold stage is the final stage of testing, preparing for the games release. Meaning that the game should only have a few minor bugs that won’t stop the player from progressing or enjoying the game. During this stage the game will be given to Q&A testers for one final check before its sold in stores. |
| 5 – Certification | During the certification stage the game is tested by the publishers to see if it meets the age and other requirements set beforehand. |
| 6 - Regression | The regression stage is when the developers will go back to the game after launch and fix any bugs reported by the player to be put in a patch which the player will have to download. |

# Game Test Phases Diagram



# Game Test Processes

|  |  |  |
| --- | --- | --- |
| Processes | Explanation of the characteristics of each process (Provide examples wherever possible) | The phase that this process takes place. |
| Smoke Testing | Smoke testing is used to see if the game assets work. For example you will load up the game and see if your character loads up and then if it does, is it falling through the floor and so on. | Preparation |
| White Box Testing | White box testing is used to find bugs by playing the game while having many bug detecting programs running in the background, then you will try and debug the glitches while logging everything down. | Preparation |
| Black Box Testing | Black box testing is a way of finding bugs by just playing the game normally how the public will and if you do find a bug repeat what you did to see if it is repeatable then report it. Sometimes developers will allow the public to help in on the testing as well. | Alpha |
| Clean Room Testing | Clean room testing isn’t actually about finding bugs its more about preventing them through the use of certain software to stabilise the game from common reoccurring bugs. | Regression |
| Play Testing | Play testing is when you let someone blindly play your game for the first time you do this in order to see if the player knows what to do and where to go. For example if I make a puzzle game I’ll already know how its solved so I’ll need some fresh eyes to see if it’s too challenging. | Beta |
| Ad Hoc Testing | Ad hoc testing is about making quick changes to the games code after its been released such as altering a weapons damage or even adding new features and characters. | Beta |

# Test Suite Creation and Implementation

|  |  |
| --- | --- |
| Testing Tools | Evidence of being created and being completed |
| TFD (Test Flow Diagram) |  |
| Data Dictionary |  |
| Combinatorial Table/Bug Report |  |

# Test Flow Diagram (TFD)

No

Yes

No

No

Yes

Yes

Replay?

Load Game Over

End

Has player won?

Is player Dead?

Player plays level 1

Load Game

Start

# Data Dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Name | Object Type | Event | Action | Purpose |
| Player | Sprite | On collision with:  + | Destroy Player + Restart layout | This is the main character and when he collides with an enemy (the snake) and water the player will die, then the layout will restart and the player will have lost a life. |
| Coin | Sprite | On collision with: | Destroy Coin + Add 1 point to score | This is a collectable in the game it adds to the players when collected. |
| Collision\_Solid | Sprite | On collision with: | Solid | This is a sprite with a solid behaviour on it so when the player walks on this sprite it will act like solid rather than allowing the player to fall through the level. |
| Collision\_Death | Sprite | On collision with: | Destroy Player + Restart layout | This is a sprite that when collided with the player will kill them. I can put this over anything and it will still behave the same. |

# Combinatorial Table/ Bug Report

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test Reference: | Test Description / Purpose: | Object / Item Being tested: | Expected Outcome: | Actual Outcome: | Action Required: | Picture: |
| Joseph Roper 01 | Testing the player to ensure that on jump event, the jump animation runs. | The main character | The animation runs | The animation works | N/A |  |
| Joseph Roper 02 | Testing the player to ensure that the walking left animation runs. | The main character | The animation runs | The animation works | N/A |  |
| Joseph Roper 03 | Testing the player to ensure that the walking right animation runs. | The main character | The animation runs | The animation works | N/A |  |
| Joseph Roper 04 | Testing the enemy to ensure that the idle animation runs. | The enemy | The animation runs | The animation works | N/A |  |
| Joseph Roper 05 | Testing to see if the coins disappear when the player collects them. | Coin | The coin disappears | The coin disappears | N/A |  |

# Conclusion

Throughout this assignment I have learned how professionals test their games and report information properly. This will undoubtable help me in the future when testing my own games or others. Also I now know about a few common bugs to look out for such as LOD Popping and Z Fighting which are easy to fix but if left they can ruin the emersion of the game for the player.