**Indiana Run Dev Diary**

The following document outlines the steps I did for the app I was assigned to make called “Indiana Run”. The game is a 2D platformer with puzzle elements. The player takes charge of Indiana Jones and completes levels filled with deadly platforming and spike traps and once the levels are completed they will be tasked with trying to complete a puzzle.   
  
**October 10: Basic set up**

I decided the best way to set up the project was to start by designing a simple sprite and dragging it into the project. Once the sprite was rendered on screen I then decided to give simple box colliders with the sprite and then add a platform with another box collider for the sprite to land on. The Indiana Jones sprite (who will hereby referred to as, “Indie”) was drawn by me using a Lucas Arts Adventure Game sprite as reference.

**October 14: Get Moving**

Next step of the project was to implement basic controls. As stated in my design brief the game was too use touch controls with a simple touch for moving left, right and jumping. I decided to work on the movement of the sprite before the actual jumping. I assigned the screen width as a value and used an if statement to detect which area of the user touches, if he touches the left most quarter he will move left, a little bit to the right of this boundary the press area will move the sprite to the right. I included serialized variables/fields, so I could play with the players move speeds.

**October 19: Jump Trials**

Today I decided to mess around with how I can get jumping to work, I decided to use the final right hand most area of the screen as a new touch boundary in the movement script. Pressing this area of the screen Will allow Indie to jump. Unfortunately, I can’t seem to make the sprite lift off high enough. He just performs a very tiny hop. Will need to fix this.

**October 21: Moon Jumps**

Fixed the bug and now Indie can jump as high as I want him too. Problem now is that Indie can jump as many times as he wants mid-air, I have decided to fix this bug at a later stage and work on the actual level and puzzle design now. The “moon jumping” can also help me move about the levels faster to test features easier.

**October 25: Art Attack**

I decided to use today as a day to just work on sprites and other available art assets for my game. Getting this out of the way earlier seems like a better idea as it gives me more time to focus on harder functions of the game. I spent the whole game creating jungle themed art assets for the games levels. After I completed my last drawing, I dragged them all into unity. The art I made was just simple decorators and sprites for the environment, going to see what to do with them tomorrow.

**October 28: Sculpting**

Now to actually give the game some life, I decided to actually make the first level today. I drew up a rough idea on the layout of my level and then went to work on actually making it in the game. I noticed I was taking up way too much space in my hierarchy so I needed to do some research on some way I could try and avoid this. After doing some research online I discover a handy little feature called “tile maps”. Using a tile map would save so much space in my hierarchy and allow my sprites to not look stretched out to save level space. I added my sprites to the tile map and “drew” out the basic outline of the level, adding walls to any areas the player could possible escape and be stuck in an infinite fall.

**October 30: Alas, Poor Yorick!**

Decided today is the day I add some form of death to my game. According to the design dock the game contains no enemies just deadly pits and falls so I figured the best thing to do would be to make spikes. Keeping the jungle theme of my game I drew up some bamboo spikes in GIMP and placed them into my game. I then added a box collider which triggers once the player character touches the collider, once triggered, the player “dies” and the level reloads.

**November 1: Puzzled**

Now for the hard part. Implementation of the puzzles. According to the design doc there needs to be a puzzle at the end of each level, I’m quite stumped on what form of puzzle to make since meetings with the Designer in person he told me I could do them how ever I want. Decided the best way to go about this is to create my puzzles in a separate scene (level) that loads once the level before it is complete. As for the puzzle itself I’ve tried to implement a type of sliding block puzzle (the kind you’d see done with tiles and inside a small box) but after a decent few hours of trying this I might scrap it and make something different. No amount of tutorials online can even seem to help me.

**November 3: Meat and Potato’s**

Feel like leaving the puzzle just for now and actually adding some “buff” to the first level itself. Spikes and platforming is cool and all, but I think I’m going to need a few more features to make the level a bit spicier. I first added “falling platforms”. Simply by adding a basic platform to the level with a script. The script makes the platform move downwards after half a second of indie standing on it and after 2 seconds the object is destroyed. Next up I done another script for a moving platform that moves between certain points on the x axis. Unfortunately, indie doesn’t move with the platform and instead just seems to glide off it. Will fix later.

**November 6: Collectathon**

Since the design spec asks for a scoring system and collectables I had a meeting with the customer and asked him if it was ok to add collectables that added to a score for the game, he said it was fine. I drew up three sprites in unity, a bronze idol, a silver idol and a gold idol. The way I’m planning on having them work is   
  
Bronze Idol = Easy to find in level, gives very little points

Silver Idol = Requires a bit of difficult platforming to get, gives modest points

Gold Idol = You’re going to need to think outside the box to get this one, gives high point reward and gives the player a shortcut to skip to the next level without having to do the puzzle.

Currently they can’t be collected as I still need to add the script that allows that, but they work for placeholders for now.

**November 9: Goals**

After adding in the collectables I decided that I should actually add proper level goals to the level. I’ve decided that in every level there will be a map as well as a diamond. If indie collects the map he will be brought to the next puzzle. However, if Indie collects the diamond he will skip the next puzzle and go straight to the next level (however finding the diamond is much more difficult since it will require finding the gold idol as well) I added a basic level transition script for these objects that contains a serialized field which can be used for level navigation (example: if Indie collides with the diamond in level 1, level 2 will be loaded, if he collides with the map in level 1, puzzle 1 will be loaded.

**November 12: More levels**

Added more levels today, a level 2, puzzle 2 and finally a level 3. Done a small bit of work on the layout and function of level 2 but besides that it was just busy work.

**November 15: Puzzle Work**

Decided to scrap the original puzzle idea of sliding tiles and instead go with a very basic picture rotation puzzle. To put it simply, I add a sprite to my resources, use sprite editor to splice it into multiple sprites (in the case of puzzle 1 its 4) and then using a game control script I can drag each splice of the image into different array elements. Once all the elements z rotation is equal to zero (they should then complete the default complete picture if placed in the right locations) a win text will be displayed and then the next level should load. Everything seems to work fine with 4 puzzle pieces but I think I will have to make a separate script for each one to take in even more puzzle pieces.

**November 18: Stop, Go, Stop, Go, Stop, Go**

Took an easy day today due to upcoming exams and focused on a bug that’s been annoying me since movement implementation. For some strange reason while moving indie will randomly come to a complete halt as if he is hitting something. After some research online, I figured out its because I had a box collider assigned to him, since the box is rectangle in shape just like my tile map collisions Indie will sometimes get stuck on random surfaces. How do I fix it? Easy! Just change the box collider to a circle collider

**November 22: Magnets, How Do They Work?**

Now to play with the collection script. I decided to take a “coin magnet” I had from a previous unity tutorial and add it to my player sprite. The script takes a second circle collider in and uses it to “magnetise” the collectables towards indie if he’s within range. Unfortunately, even though this worked in the previous tutorial I completed sometimes the collectables will magnetise towards indie and send him on a one-way trip to the moon. Once collided Indie will ride it like a rocket and just keep going into the air until the collectable is eventually “absorbed” by Indie and he falls back down again. Will try and fix this later.

**November 26: Level 2 Set Up**

Done all the basic set up for level 2, hope you don’t hate those levels in games with falling platforms in them that force you to jump precisely as fast as you can, because that’s what this level is all about! Placed in all relative scripts, collectables, platforms and the likes.

**November 30: Puzzle 2**

Todays the day I complete puzzle 2, same story as before except this time the puzzle contains 6 rotating pictures instead of 4.

**November 30: Doing More?**

According to the design doc the game is only supposed to contain two levels but after a meeting with my customer he okayed me to make an additional one. So I used the whole day to make the layout of the level and add all the standard features such as collectables and the likes. For this third and final level I’ve hidden the diamond and gold idol very sneakily and have the diamond bring the player to a results screen and the map will bring Indie to the final puzzle of the game.

**December 1: The Final Puzzle**

The last thing I need to do before copious amounts of bug testing and fixes is implement the final puzzle. Same rule as before, different script that takes 10 slices instead of 6 or 4 but I also drew the final puzzle a lot more cryptic than the other “map” ones, drawing millions of occult symbols and markings, I hope the final puzzle will make players scratch there heads a lot.

**December 2: Paint Me Like One of Your French Girls**

Today was a very easy day. I spent the whole day making the levels and puzzles look nice by adding in back ground sprites and other various decorations and objects. Not hard by a long shot but this defiantly needed to be done before I started all my testing.

**Testing**

The following are tests I completed for the game to ensure I can have everything running as smoothly as possible.

**Test 1**

Fixing moon jump bug.

**Problem?**

Indie can jump infinitely into the air thus creating a “Moon Jump” effect.

**Fix?**

I added a tag to the tile map called “Ground” and set a bool called “isGrounded” in my movement script. When Indie is touching the ground, the bool is set to true and while the bool is true indie will be able to perform a jump. While in the air the bool is set to false thus Indie cannot moon jump anymore.

**Test 2**

Fixing stop and go bug.

**Problem?**

Sometimes while moving indie will randomly stop in place or slow to a crawl.

**Fix?**

Another easy fix, changed indies main box collider to a circle collider instead

**Test 3**

Fixing “Collectable Rocket Ride”.

**Problem?**

When Indie collides with a collectable idol sometimes the magnetism causes Indie to be propelled upwards by the idol until collision eventually occurs 80’000 feet in the air.

**Fix?**

Simple fix, the magnet circle collider was placed inside of Indies movement and base collider. I placed the magnet collider a bit outside of the main player collider and now idols can be collected by indie with ease

**Test 4**

Fixing stop and go bug.

**Problem?**

Sometimes while moving indie will randomly stop in place or slow to a crawl.

**Fix?**

Another easy fix, changed indies main box collider to a circle collider instead

**Test 5**

Basic level 1 test

**Problem?**

Decided to test the very first level of the game and note any changes.

**Fixes?**

Fixed error was player would collide with spikes and not die, turns out the object didn’t have the spike tag attached. Edited bottom of map was the silver idol is found due to the fact the player could not leave once he obtained it. Fixed diamond objective not bringing the player to the next level (name for the level was case sensitive)

**Test 6**

Basic puzzle 1 test

**Problem?**

Decided to test the very first puzzle of the game

**Fix?**

Puzzle works rather well

**Test 7**

Entire map route test.

**Problem?**

Decided to save myself some time by testing the basic route the player takes through the game.

**Fixes?**

Many. The first problem I encountered was that once the player completed one puzzle they could not complete any other puzzles after this. This was due to the fact I had an if statement that would only allow puzzle pieces to be rotated if a puzzle was not “won”, however, if the player completes the first puzzle and try’s the next he cannot rotate the pieces due to the fact the puzzle win condition has been met. The simple fix was to just remove the if statement, its only purpose was to stop the player rotating puzzle pieces after the puzzle was solved but due to the fact the next scene loads upon completion it is unneeded.

**Test 8**

Entire diamond route test

**Problem?**

This test was to ensure that all secret diamonds in the game would allow the player to skip the puzzle.

**Fixes?**

Only one error encountered, one of the diamonds was missing a box collider. However, while doing this test I also encountered a few bugs were some platforms were missing tags thus Indie would fall through them.

**Test 9**

Collison’s and tags test

**Problem?**

Some platforms seem to be missing either colliders or the respective tag that corresponds to certain scripts (such as the platform child/parent script needing a tag of “basicPlatform” but not actually having this tag on some of the moving platforms).

**Fix?**

A good few platforms were missing their tags and colliders most likely due to me using the ctrl and D function a bit too early with some platforms. All respective tags and colliders have been added.

**Unfinished Features**

The following is a list of unfinished features that I could not implement on time

* Animations for main player sprite, since this wasn’t a requirement for the project I left it last minute and just couldn’t seem to get it to work with the little amount of time I had in the end
* An additional 4th level and puzzle (could not meet with customer in time to see if it was ok with them)
* End screen that displays final score as well as a grade you would receive based on the score you got.

**Conclusion**

My game fits the criteria that was given to me quite well, I was a little disappointed I was making a game without a combat system or enemies, but I had a lot of fun implementing the puzzle features and trying different forms of puzzles before finally deciding on one. The design doc specified that the game would use touch controls and only work on android (**IMPORTANT NOTE:** The game cannot be played inside unity’s player as the jump button does not work, the only way to truly play the game is to download the apk and try it on your phone.) and I have that implemented since the very start nearly. The two links below contain video walkthroughs of both the diamond and map routes of the game. Recording was done on my Samsung galaxy s6 using screen record of the installed apk.

Map route: <https://www.youtube.com/watch?v=w6S4cR2WIbM&t>=

Diamond Route: <https://www.youtube.com/watch?v=RzocAqPsQYg&t>=

**Sources**

<https://www.youtube.com/watch?v=iSnOWqTPUNQ> For the amazing puzzle theme I added to the game

<https://www.youtube.com/watch?v=y2Yhour0lGw> For the games main theme.

Lucas Arts Entertainment for the inspiration for the indie sprite.

Brackeys for his vast library of YouTube tutorials and guides.