GAME DESIGN TEST

PLATFORM GAME

Name: Steve Tonneau
Age: 24
Previous or current occupation:
Computer sciences Engineer

Goals:
- define the basic elements of a 2D platform game matching this context
- integrate them into a level
- evaluate your knowledge of casual gaming market.

Tools required: Word + Bitmap editor (Photoshop, Paint…)

Part one

The goal of this part is to define the skills and abilities of a 2D-platform main character.

My project name is called *A matter of some gravity.*

1.1 Main character and abilities

Basic abilities are:
- *Move to the right*
- *Move to the left*
- *Jump (Jump height = twice the character sprite height)*
- *Crouch*

1.1.A) Design the main character, make a short description of him below: (no drawing needed)
Charles Oriolis is a student like there are many across universities. He's tall and kind of fat, yet athletic, and has big brown hair. If he is a smart kid, he is capable of saying the stupidest things at the same time, in the way only young people can do.
As most members of his generation, he's not easily impressed and always has a sarcastic comment to provide for any situation.
And, again, as most young people, he is deeply depressed because his girlfriend broke up with him recently. In fact, he's so depressed that he's been laying in his bed for the last three weeks, which is luckily situated close enough to his fridge and his bathroom.
This morning, he received a text message from his girlfriend, in which she asked him to meet her at the other side of the town. Enchanted by the message, he decided to go to the date, but, when he tried to stand up, he realized that his sense of gravity had been modified! Now standing on the wall of his room, he supposes that having kept a horizontal position for so long is the only "rational" explanation to his condition.

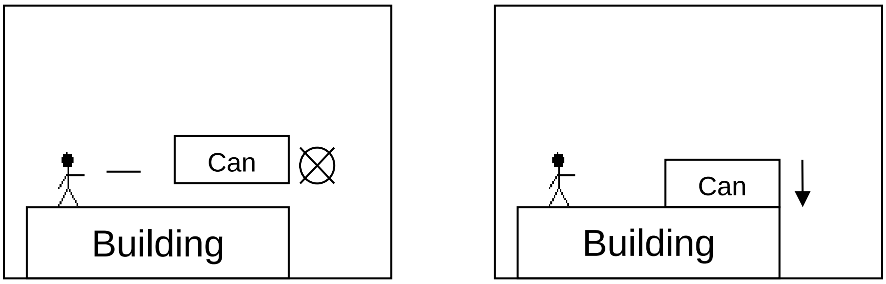
Determined to join his love and give back a "sense" to his life, our hero has to go across the town and face the dangers of being unfit to his world...

1.1.B) Describe his universe shortly.
Charles will soon find out that a lot has happened in the last few weeks.
Aliens have landed on earth, and for rather mysterious reasons, are shooting randomly at people with strange weapons that are completely reversing their gravity, making them "fall" to their spaceships.
Charles condition allows him to avoid such a space trip, since reversing his gravity only makes him change the wall he is standing on. His laziness turned him into the humanity's biggest hope to save the world, a task he will gladly achieve as soon as he'll have found his girlfriend.
To get closer to her, he'll have to make his way trough each level, using vehicles, garbage and gravity to go from one building to another and reach the exit.

1.1.C) Define 3 special skills

- **Gravity gun**: Early in the game, Charles finds a modified **gravity gun**, which he can use on **cars**, **garbage cans** and **enemies**. When the player fires, a horizontal ray comes out of it. Its range is infinite. The first available target it will collide with (if there is one) will become affected by the player's sense of gravity (i.e. a horizontal gravity force is applied). By available, we mean "mobile". The gravity gun has no effects on buildings for instance, but it works on moving **cars** and **garbage**.

  Ex: In the beginning of the demo level, the hero can fire on a **garbage can** situated "above" him. As a result, it will "fall" to the bottom of the screen, collide with a **building** beneath, and then be used as a platform that can be jumped on



Firing on the can changes the direction of the attraction strength applied to it.

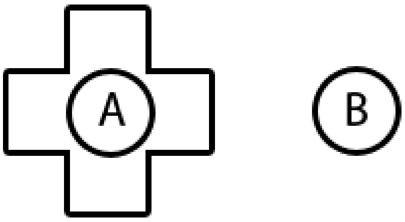
- **Lemonade jetPack:** To help him through his journey, Charles has somehow managed to build a jetpack, in which the high pression is obtained by combining some **lemonade** and a **candy** that can be found in **vending machines**. Those machines are opened by running on them, and the bonus is then delivered to the player. A **lemonade bottle**, combined with a **candy**, gives him 5 seconds of planning. Each time the power is activated, a **candy** is spent, and the time remaining diminishes as long as that power is active. The remaining time is visualized by a **lemonade bar** visible in the upper right part of the screen. Finding a new bottle restores the bar to its maximum value, i.e. 5 seconds.
  The number of **candies** that Charles can store is limited to 5.

This number is visualized on the screen, under the **lemonade bar**. For each **candy** the player has, a **candy** is drawn on the screen.

- **Grab**: Charles can grab **cars (moving cars and cabs, presented later)**, **garbage cans, aeration grids, and manhole**. Grabbing a **car** or a **garbage can**, if it's moving, will help him to stay longer on the object. For instance, if he's grabbing a car that rolls to the right faster than he can run, he'll stay on the car, but will slowly slide to the left until he eventually falls from it.
  When grabbing an **aeration grid**, Charles will escalade them. This will allow him to reach higher places.
  Grabbing a **cab** or a **manhole** will activate its special effect (described later).

1.2 Controls

1.2.A) Define the controls under the following constraints:
- 4 Direction pad + 2 buttons (A and B).
- No **double** input (i.e.: no diagonals are possible, no button and direction is possible)
- Button layout is as follows:



1) Move to the right: right arrow
2) Move to the left: left arrow

Comments:

Each input modifies the current speed, to a rate depending on Charles location. If Charles is on a platform, the acceleration is equal to 200 pixels * second^{-2}. If in the air, 160 pixels* second^{-2}. When using the **jetpack**, the speed modifier is equal to 0, since we can not use the jetpack and move at the same time (no double input). This represents the fact that, even if we allow the player to move in the air, it musn't be as easy as it is to walk on ground.

Also, friction forces are applied to stop the player horizontally. In the air, their value is equal to 10 pixels . second^{-1}, and 100 pixels * second^{-1} in the ground.

The maximal horizontal speed is equal to 100 pixels * second^{-1}.

The maximal vertical speed is equal to 200 pixels * second^{-1}.

3) Jump: B button (only if colliding with a platform)

Comments:

The jump height is equal to 24 pixels. The gravity g is set to a value of 192 pixels* second^{-2}.

The jump lasts one second, so, in order to obtain the desired height for the jump, the initial speed value applied to the jump on the y axis is equal to 92 pixels * second^{-1}.

4) Crouch: down arrow (only if colliding with a platform beneath the hero)

5) Special 1: Grab: A button (maintain pressed)

6) Special 2: JetPack; in the air: B button (pressed)
Comments:
The jetpack is activated after having pressed the button for 25 ms, and staying in the air. It stops functionning if the button is released or if the remaining jetpack time reached zero.

7) Special 3: Gravity gun: up arrow
Comments:
The ray is shot in the direction the player is currently facing.

Button priority:
Since no double input are allowed, button priority is as follows, from the most prioritary to the lesser one :
A, B, Up arrow, Left arrow, Right arrow, down arrow

1.2.B) What are, according to you, the particular problems induced by no double input controls in a 2D-platform game?

First of all, the most obvious issue posed by such a constraint is movement limitation. If we consider a classic platform game approach, we can usually use a power while running, or sometimes move / use a power while crouching. With a classical gameplay, such actions are impossible.

Another issue is that the number of available inputs can not be increased by using button combination (such as: directional input + jump input to jump from a wall in new super Mario), and, considering the number of buttons at our disposal, this is problematic.

1.2.C) Could you find a solution to these problems?

Several options are available to these issues.

The low number of inputs issue is avoided by using a "state approach". The jetpack power can only be activated when the player is in the air, which allows me to use the A button twice (once for jump, once for activating a power), but in a determistic way (Depending on the state, we always know what the player is trying to achieve). The interesting and important thing is that, considering the power, it perfectly makes sense for the player: not being able to jump when in the air is acceptable, and activating the jetpack only when in the air is reasonable as well.

This could be used as well to resolve the movement issue. For instance, usually when the down button is released, a character would stop crouching, but we could decide that a second down input is necessary for the hero to stand up. That way he would be able to move while crouching.

I chose instead to apply the basic laws of physics. When the player releases his movement input, its avatar does not stop immediatly, it is slowed by a friction force that is applied to it. This makes it possible to jump in a direction or "slide" (crouching + moving). Plus, since the game is not highly focused on action, not being able to shoot in any circumstance is not problematic at all, and the level design will never put the player in such a frustrating case, except of course if it is used as part of a puzzle to solve.

1.3 Gameplay elements

The goal of this part is to define the basic level design elements of your game.

Surface properties

The map is composed of different surfaces.

Basic surface is solid ground.
Properties: *Objects (including player) will collide with the upper part of the tile and will therefore be able to walk on it.*

1.3.A) Define 3 other surfaces
Surface #1: Garbage cans
Properties: Garbage cans are mounted on wheels, so when the player jumps or falls on them, his speed is transmitted to the can. It then starts rolling in the player's current gravity direction, until it collides with another platform or the player jumps out of it.

Surface #2: Cars
Properties: Cars are animated objects. Their speed is variable, so it might be hard for the player to jump on them. Cars stick to the road, and if they collide with something in front of them, they will use their brake.

Surface #3: Aeration grids
Properties: Hopefully, aeration grids are usable as ladders by our hero. When maintaining the grab button, the player will escalade them. When the top is reach, a little impulsion is given to the avatar, so that it will elevate above the grid.

Note on holes:
When Charles falls off the bottom part of the screen, he does not die. Instead, he goes around the world and, after a little while, appears at the top of the screen, at the same x position that he was.
On the other hand, if Charles falls "up" and disappears to the upper part of the screen, he revolves around the earth in the inverse sense of its rotation, and like Superman, goes back in time. This has for effect to restart the level, but the bonuses collected are kept.

This means that if, for instance, Charles had 3 seconds of jetPack left when he fell up and restarted the level, he will keep them.

If the player disappears from the left or the right screen, the level is restarted.

Interactive elements

Players can interact with these elements to reach new places in the level, collect some bonuses, destroy some enemies or do anything else you want. For instance: barrels from *Donkey Kong Country*, pipes from *Mario*, plums from *Rayman*.

1.3.B) Define 2 interactive elements and describe the gameplay they create.

Interactive element #1: cabs
Gameplay: Cabs are cars that are parked somewhere in the level. When the player grabs a cab, the taxi rolls to a predetermined direction and parks there, transporting the avatar as well. This can add a platform that will allow the player to reach places that were not accessible before.

Interactive element #2: manholes
Gameplay: Manholes go by two. When a player grabs a manhole, his avatar is "teleported" to the other manhole in the level.

Enemies

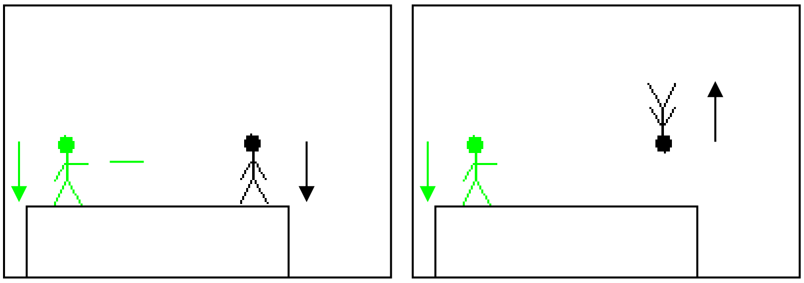
1.3.C) Define 2 enemies and describe their behaviour.

The enemies described here use a horizontal sense of gravity, which direction can vary depending on the level. (I.e. to the player point of view, they can either have the same direction as he does, or the opposite one, which means that they appear upside down relatively to its avatar).

Enemy #1: Blob alien
Behaviour: Those big alien are too tall to be jumped over. Whenever they see the player's avatar, they run at him to push him off its platform. Objects that collide with a blob will bounce on it.

Enemy #2: alien with gun
Behaviour: Those aliens possess a gravity gun modified to be effective on Charles. When a target is hit by one of its beam, this target's sense of gravity becomes the opposite of the alien one. Available targets are: the hero, a moving car, a garbage can, or another alien.

Example:



Rewards

1.3.D) Define 2 rewards

Reward #1: candy
Description: Candies are used by Charles to make its jetpack work. Each time the jetpack needs to be activated, a candy has to be used to initiate it. If the player does not possess a candy, the jetpack does not start.

Reward #2: lemonade bottle
Description: lemonade is the other component essential to the jetpack. A lemonade bottle restores the lemonade bar to its maximum value (5 seconds). If the bar is empty, the jetpack can not be activated.

1.4 Game audience

1.4.A) Why will your game appeal to a casual audience? (not hardcore gamers)

There are two aspects in a game that I think are really important:
The most important to me is the gameplay and level design aspect, and the other one is the story and the universe aspect. Of course, there are other aspects, and distinguishing those two is a reduction, but let's consider this as a structure for my argumentation.

In my opinion, the most interesting gameplays are the one who are really easy to understand, but that are designed in such a way that the player skills evolve as he plays. Such games, served by an intelligent level design, are rare but constitute in general the best games. Once again, Mario is the perfect example of that. The first level of every Mario game is designed so that it takes 15 seconds to understand that you have to go right and jump on enemies and blocks. Mario kart has a really easy gameplay, but defeating the more experienced player without using handicaps is nearly impossible.

Some complicated gameplay can lead to really good games, such as Ninja Gaiden, but this requires a lot of investment from the player, and, if he can get a lot of pleasure for overcoming such a challenge, usually only a hardcore gamer would try hard enough to go through the game.

In *A matter of some gravity*, I tried to keep the gameplay simple so that it would remain accessible to all. The player challenge is increased not by adding always more enemies and projectiles in a screen, but by designing the levels as interesting puzzles. This suits perfectly the casual gamer that will not be frustrated by an exigeant gameplay, but still will find a motivation to complete the game.

A matter of some gravity scenario was essentially developped around the gameplay and serves the level design. It does not target a young male audience, usually interested in violence and excitment provided by competition. Its humorous style, based on well known references by the wide audience, enhances the gamer interest by allowing him in accessible world.

1.4.B) Why will your game appeal to a wide audience, and stand out from other platformer titles?

I want to be a game designer partly because I think it is a job that leaves a lot of room for creativity. I also believe that works that are recognized as "revolutions" in a specific domain are never entirely original but constitute a synthesis of several evolutions and introduce a few original elements.

Building a game with such logic has an advantage. Using elements that are already known makes it easier for the public to get familiar with the game and understand it, when the new elements will introduce things that the player has never experienced before, that will help distinguishing the game from the others.

A matter of some gravity was built with that in mind. It only relies on familiar concepts, and tries to use them in an original way to create new ways of playing without confusing the player.

1.4.C) Could you imagine a concept targeted to the girl audience?
I think that, for a girl, a very important point is the social aspect of a game. This is why *A matter of some gravity*, in its final version, should provide a multiplayer cooperative mode.

If the game was specifically designed for girls, I think that the scenario would have to be written differently, by insisting more on the relationships between the protagonists, in a less absurd way. The aliens would have to be removed of the script too, because even if it is not true, they can give the game the idea that it is targeted to boys. Avoiding using stereotypical boy things would be a good idea in general.

Part two

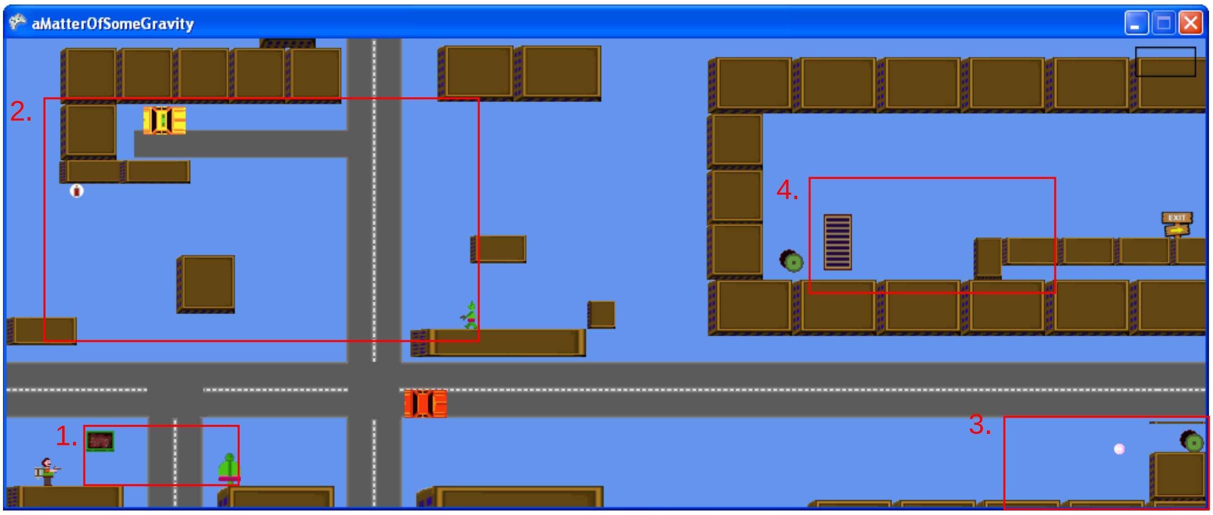
2.1 Level design

Use all the elements you've just defined to build a level. The level should demonstrate the interest of every ingredient you've just defined.

The constraints are the following:

- Level size: 1024*400 pixels (width*height)
- Main Character: 24*24 pixels

Here is a screenshot of the demo level, following the given constraints:

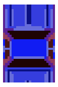


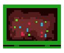
It is composed of 4 puzzles, which we'll detail here.

Legend:

: Building

: Taxi

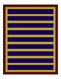

: Car


: Garbage can

: Manhole

: Lemonade

: Candy


: Aeration grid

: Exit

: Player

: Alien with gun

: Blob alien

Important note: this level is not designed to be the first one the player will encounter, hence its difficulty.

Puzzle description: (Note that a video walktrough is provided with this test)

1. This puzzle is easy. The big alien prevents us from passing. Shooting with the gravity gun on the garbage can will make it fall on the "ground", and it will then be used as a platform to jump over the enemy.
Another option is to "fall" to the platform above, and then to grab a car or jump on the can to pass.

2. To reach the bottle, the alien with a gravity gun will help us. The player must let himself be hit by a beam, then run to the cab and grab it. The taxi will then be placed in such a way that it will serve as a platform to reach the bottle.

3. There are two puzzles in this one. First, in order the reach the bottom right platform, the player needs to grab a car.

But once he’s there (or before), he’ll see that he can not jump high enough to reach the manhole. The solution is to use the gravity gun on a car rolling to the right, and then use it as a platform (again).

4. Esc alading the ventilation does not seem sufficient to reach the platform to the right and the exit. Hopefully, solving the 2 previous puzzles provided us with the ability to use the jetpack.

2.2 Fake screenshot

Using whatever bitmap editor you want, make a fake screenshot of your game

Constraint:

- Screen size: 240*320 pixels (width*height)