

Game Development with Construct 2

Simple Platformer Game using Construct 2

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Video game is a form of entertainment that are very popular nowadays. The advancement of technology make it easier for people to play video game on any platform. Because of this, video game development and game engine have also become an important thing. One of the simpler game engine is Construct 2 which can be used to develop HTML5 2D game. In this paper, writer is going to explain some of the basic on game development using Construct 2. The game that will be created in this paper is a simple 2D platformer game that use some of the main feature of Construct 2 game engine.

Keywords—Video game; Game Engine; Platformer; HTML5; Construct 2.

I. INTRODUCTION

The advancement of technology brings up multiple ways of having fun and entertainments. Every few years, a new technology which provide new kind of entertainment will rise, e.g., smartphone, tablet, virtual reality, etc. One of the most prominent source of entertainment now is video games. As explained by Phil Owen (2016), video game is interactive digital entertainment that you “play” via a computer, a game console (like the Xbox or PlayStation) or a phone or tablet.

As an important source of entertainment, video game is always evolving. The development of video game technologies bring more genres (action, adventure, etc), game platform (computer, XBOX, etc), and purpose (casual, educational, etc). Nowadays, there are multiple ways to get video games, especially on computer. Advancement of internet provide an easy way for people to play video game from the cloud.

Since video game has become a major entertainment source, video game development also come as an important work. There are many tools that can be used to develop video games, e.g. Unity, Unreal Engine, Marmalade, etc. Each tools have each speciality like better graphics, easier to use, and better community and assets. Each tools also make games on different platform. Unity for example is able to produce games on multiple platform ranging from mobile phone to computer and game consoles.

Online gaming is one of the more popular video game platform. Some online game must be played through client application that needed to be downloaded and installed first. Others can be played directly through web browsers by utilizing technology like flash or HTML5. Construct 2 is a

game development tools that is used to make a game to be played through HTML5 web browsers. The game that will be constructed in this paper is a simple two-dimensional platformer game. Tools that are used in this paper including Construct 2 free edition, and the tutorials and assets provided by Redfoc.com (<https://redfoc.com/platformer-series-construct-2-tutorial/>).

II. LITERATURE STUDY

A. Game Engine

According to Jeff Ward (2008), game engine is fairly simple, it exist to abstract the (sometime platform-dependent) details of doing common game-related tasks, like rendering, physics, and input, so that developers (artists, designers, scripters and, yes, even other programmers) can focus on the details that make their games unique. To put it simply, game engines are tools that is used by game developer to make the process of creation, development, and maintenance of a game on multiple platforms.

B. HTML5

HTML5 is the newest technology standard to build web page. There are some new features on HTML5 which differs it from its predecessors, including canvas, audio, and video elements. HTML5 can also be used to create a simple game just like flash. HTML5 is also cross platform, which means that it can be accessed through any device, e.g., smartphone, computer, smart TV.

C. Construct 2

Construct 2 is a game engine specialized to make 2D game on HTML5 platform. The main aim of Construct 2 is for non-programmer to easily create a game through drag and drop and visual editor system. Construct 2 come in three different licenses, free (none commercial use), personal license (limited commercialization), and business license. Construct 2 also provide an asset store that can be accessed in scirra.com/store.

III. PLATFORMER GAME BUILD WITH CONSTRUCT 2

A. Developing Game with Construct 2

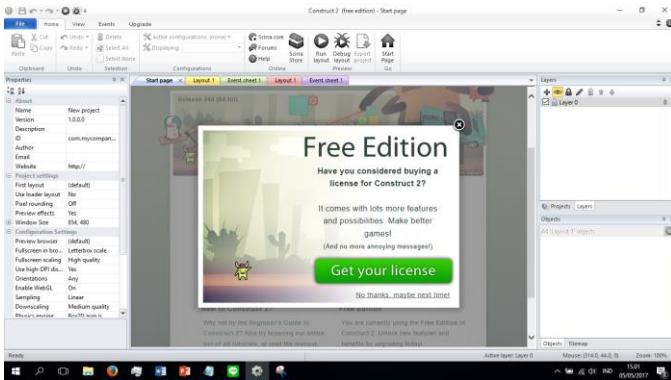


Image 1. Construct 2 Main Page
Source: User documentation

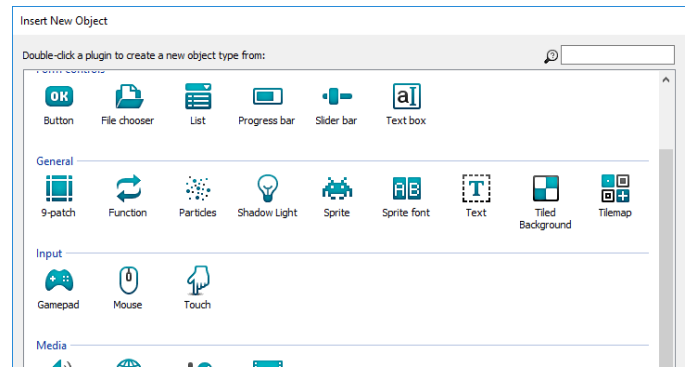


Image 2. Construct 2 Insert New Object
Source: User documentation

Creating game using Construct 2 can be done easily because most of the components needed are provided by Construct 2 engine. There are six main components that are needed to make a game using Construct 2, they are: layouts, layers, objects, variables, behaviors, and events. The explanation for those components are as below:

1. Layouts

A layout is a pre-arranged *layout* of objects. Layout can represent a game level, menu or title screen. Each layout has associated event sheet which defines how the layout works. Layout contains a stack of layers. Construct 2 provides some pre-build layout for some game, e.g., platformer, driving, and shooter game. Those pre-build layouts come with common events like character movement and shooting in a shooter game. Users can use those layouts to quickly build a game that they want.

2. Layers

Layer is a sheet in which objects are put and edited. Layers can be used to put objects in front or behind each other. Each layout has a layers bar in which layers can be added, edited, or removed. Layers can be scrolled at different rates for parallax effects (An effect in which background images move slower than foreground images), and also individually scaled and rotated. Layer is important to create GUI or HUD which contains objects that doesn't move at all (0,0 parallax).

3. Objects

Objects are the things that are inside the game being built. In Construct 2, game objects are inserted through the insert new object feature or by dragging image(s) to Construct 2 game layout. Each objects can have their own instance variables, behaviors, and matching events inside each layout. Objects can also have multiple animations which can be played through certain events.

4. Variables

In construct 2, there are two types of variables: event variables and instance variables. Event variables are number or text value which are either global or limited to a layout. Instance variables are number, text, or boolean value that are added individually to an object instance. Variables, both global and instance are useful to make some game components like health bar, movement, animation, etc.

5. Behaviors

Behaviors can be added to each objects. Construct 2 provide some common behavior that are ready to be used and can be edited to suit user's preferences. These behaviors can be used to make user control, solid object, object movement, etc.

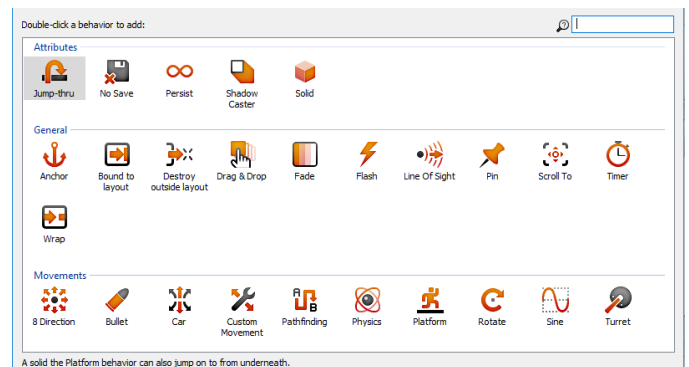


Image 3. Construct 2 Insert New Behavior
Source: User documentation

6. Events

Events are the main feature of Construct 2. Instead of using user script, Construct 2 provides a logical block system called sheet in which user can controls what can and will happen inside the game. Event consists of condition(s) that are needed to be achieved to trigger certain action(s).

Global number Gem = 0			
1	playerRed... Platform On moved	playerRed_stand	Add action Set animation to "Walk" (play from beginning)
2	playerRed... Platform On stopped	playerRed_stand	Add action Set animation to "Stand" (play from beginning)
3	playerRed... Platform On jump	playerRed_stand	Add action Set animation to "Jump" (play from beginning)
4	playerRed... Platform On landed	playerRed_stand	Add action Set animation to "Stand" (play from beginning)

Image 3. Construct 2 Event Sheet
Source: User documentation

Those six components are the basic components used to make simple game in Construct 2. In addition, there are more features that are not as important but can be used to improve the game, including: effects (to change object visual appearance), containers (to build composite objects), and families (group of object types).

B. Platformer Game Build with Construct 2

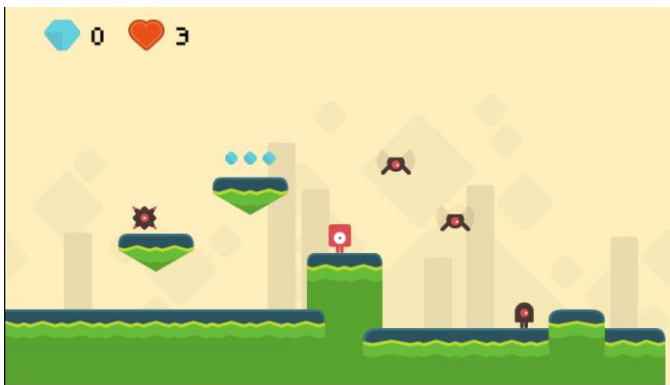


Image 4. Platformer Game
Source: User documentation

The platform game that the writer's build is a simple run to the goal and avoid the obstacle platformer game. Player will move a single character in three direction (up, left, right) using the arrow key. Player must move the character to the end of each stage on the right side and avoid all the enemies and obstacles. Player will have five health which will go down everytime he/she got hit by the enemy. Player can also get more score by obtaining the blue gem which are scattered across the map. The objective of the player is to obtain as many gem as possible without taking any damage and to finish the map as fast as possible.

There are 4 layers on the game that is built, they are: background, ground, game, and HUD. Background contains the static background of the game. Ground is the map of the game which consists of ground, obstacles, and moving platform. Game contains the player object, enemies, and the scattered gem objects. Game layer also contains the goal post that the player must reach. HUD is player's HUD which show the amount of gem obtained and the amount of health left.

The player has a variable which save the amount of health the player has left. On the event there exist a global variable "Gem" which saves the amount of Gem player has obtained.

Player object has three behaviors: Platform, Scroll To, Flash. Platform are used so that the object can be controlled through controller (keyboard, mouse, or other controllers) and do movement. Scroll To make the game camera lock on the object and follow it's movement. Flash make the object flashing when the event is called. Other behavior that is used by the enemies objects is Sine behavior. This behavior make the object do movement in a period of time based on the parameters that are given by the developer.

Most of the moving objects, be it player or enemies, have some animations. Player has stand, walk, jump, fall, and dead animation. Most enemies have moving animations. Those animations are called based on the event. For example, player's jumping event are called when player move up. Events are also used to trigger the right action for every possible causes. For example, when an enemy collide with player, it will trigger the player to decrease it's health point. Event is also used to detect if player's health is 0 or smaller and trigger the game lost action.

IV. CONCLUSION

Game development can be done quite easily through the use of game development engine. One the easier to use engine is Construct 2 game engine which has a simple drag and drop interface and can be used to develop HTML5 2D game. One of the game genre that can be developed using Construct 2 is platformer which are being developed by the writer. By utilizing the right game engine, everyone can create their own game in an easier way.

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