2D Game Engines

Game Maker Studio

* Supports Visual Scripting
* Has its own programming language Game Maker Language
* Straight Forward and intuitive
* In-built image editing
* Backwards compatible

Construct

* Pre-packaged behavior system
* Multiplatform Export
* Easy to read event system
* Instant game preview
* Option to code in JavaScript

Godot

* Comes with built-in nodes and the ability to create your own nodes
* Persistent Live Editing which can be done while running the game
* The ability to create custom tools
* A scene system which allows you to create node compositions
* The option to use cut-out of sprite-based animation

Phaser

* Used to create browser games
* Specialized for Mobile browsers but works on all systems
* Animation is available through the use of sprite sheets
* Users have 3 physics systems to choose from
* Allows objects to be put together in groups to save time for example all bullets will be in bullet group and all enemies will be in enemy group to make collision detection easier

3D Game Engines

Unity

* Supports Social Media Integration
* Multi-language support for C#, BOO & JavaScript
* Uses OpenGL graphics API
* Multiplatform, support for 17 different platforms.
* Readymade artworks, scripts and more can be found in the Unity Asset Store

CryEngine

* Sandbox mode support intuitive Level Design and include Flowgraph
* Includes parametric skeletal animation
* Includes Built in Buoyancy and Water Simulation
* Statoscope features allows the user to pinpoint performance issues by viewing a detailed over view
* In-Game profiling allows the user to pinpoint performance issues directly from within the game instance.

Unreal Engine

* Out of the box support for C++, plugins can be installed to use other languages
* Landscape and terrain tools allow the user to sculpt and paint the terrain directly from Unreal Engine
* Automatic Level of detail generation which helps to optimize assets
* Take Recorder feature allows you to record animations by using live motion capture
* Features a sophisticated lighting system with features such as volumetric fog, precomputed lighting scenario, atmospheric sun and sky environments and many more

Panda3D

* Highly flexible can run on any platform
* Comes with out of the box support for many popular third-party libraries
* Rapid porotypes, Panda3D requires no boiler plate or initialization code
* Can be use with C++ or Python Languages
* Detailed performance profiling that allows you to track what goes on every frame

Gaming Programming Languages

Java

* Object Oriented programming language
* Java is portable because it generates and architecture-neutral file format

JavaScript

* Allows for form validation
* JavaScript is a case sensitive language

C++

* Allows for memory management
* C++ is a compiler based language

C#

* C# is an interoperable language
* Modern programming language with a Rich Library

Python

* Python is a developer-friendly readable language
* Free and Open source

Lua

* Lua is a free and open source extensible language
* Cross platform support

Papyrus

* Object oriented programming language
* A sizeable selection of in built functions

Compression in multimedia

Compression is used to reduce the size of multimedia objects, this is important because it eliminates redundancy and can save user resources such as hard disk space and bandwidth. Loss compression can be useful in reducing the size of video, photo or anything that does not need to match its original when de compressed. Lossless compression is a different class of data compression algorithms and allows the original data to be reconstructed exactly and thus is useful when accuracy is very important. Certain image file formats e.g. Png or Gif can only make use of lossless compression making it a requirement in those cases.

Entropy Encoding

Quantization

Forward Transform

Source Image Data

Compressed Image Data

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