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# 2d Game Engine

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Programming 2D Games  
Mastering Unity 2D Game Development  
Game Physics Engine Development  
A Hands-On Guide to Game Creation  
Game Development with MonoGame  
How to Build a Robust Commercial-Grade Physics Engine for your Game  
Advanced 2D Game Development  
Game Development Patterns and Best Practices  
Learn to Design, Implement, and Use a Cross-Platform 2D Game Engine  
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Learning 2D Game Development with Unity  
Introduction to Video Game Engine Development  
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Learn Unity for 2D Game Development  
Build your own 2D Game Engine and Create Great Web Games  
Moving from Unity to Godot  
Mastering Unity 2D Game Development - Second Edition  
Create Amazing Web-based Games with JavaScript and HTML5  
Creating 2D Games with Unity  
MonoGame Mastery  
Developing Games in Java  
Build a Complete 2D Game from Start to Finish Using the Unity Game Engine  
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Independent Game Programming with C#  
Game Engine Architecture, Second Edition  
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2D Graphics Programming for Games  
Essentials for Every Game  
Build Your Own 2D Game Engine and Create Great Web Games  
Learning Unity 2D Game Development by Example  
Build a 2D Game Using Your Own Reusable and Performant Game Engine  
Learn to Create and Publish Your First 2D Platform Game  
Beginning Game Development with Godot  
Build a 2D Game from the Ground Up  
Using HTML5, JavaScript, and WebGL2  
Game Programming  
Core HTML5 2D Game Programming

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*Programming 2D Games* Packt Publishing Ltd

Follow a walkthrough of the Unity Engine and learn important 2D-centric lessons in scripting, working with image assets, animations, cameras, collision detection, and state management. In addition to the fundamentals, you'll learn best practices, helpful game-architectural patterns, and how to customize Unity to suit your needs, all in the context of building a working 2D game. While many books focus on 3D game creation with Unity, the easiest market for an independent developer to thrive in is 2D games. 2D games are generally cheaper to produce, more feasible for small teams, and more likely to be completed. If you live and breathe games and want to create them then 2D games are a great place to start. By focusing exclusively on 2D games and Unity's ever-expanding 2D workflow, this book gives aspiring independent game developers the tools they need to thrive. Various real-world examples of independent games are used to teach fundamental concepts of developing 2D games in Unity, using the very latest tools in Unity's updated 2D workflow. New all-digital channels for distribution, such as Nintendo eShop, Xbox Live Marketplace, the Playstation Store, the App Store, Google Play, itch.io, Steam, and GOG.com have made it easier than ever to discover, buy, and sell games. The golden age of independent gaming is upon us, and there has never been a better time to get creative, roll up your sleeves, and build that game you've always dreamed about. *Developing 2D Games with Unity* can show you the way. What You'll Learn Delve deeply into useful 2D topics, such as sprites, tile slicing, and the brand new Tilemap feature. Build a working 2D RPG-style game as you learn. Construct a flexible and extensible game architecture using Unity-specific tools like Scriptable Objects, Cinemachine, and Prefabs. Take advantage of the streamlined 2D workflow provided by the Unity environment. Deploy games to desktop Who This Book Is For Hobbyists with some knowledge of programming, as well as seasoned programmers interested in learning to make games independent of a major studio.

[Mastering Unity 2D Game Development](#) Apress

Build your own 2D Game Engine and Create Great Web Games Using HTML5, JavaScript, and WebGL Apress

**Game Physics Engine Development** CRC Press

Hailed as a "must-have textbook" (CHOICE, January 2010), the first edition of *Game Engine Architecture* provided readers with a complete guide to the theory and practice of game engine software development. Updating the content to match today's landscape of game engine architecture, this second edition continues to thoroughly cover the major components that make up a typical commercial game engine. New to the Second Edition Information on new topics, including the latest variant of the C++ programming language, C++11, and the architecture of the eighth generation of gaming consoles, the Xbox One and PlayStation 4 New chapter on audio technology covering the fundamentals of the physics, mathematics, and technology that go into creating an AAA game audio engine Updated sections on multicore programming, pipelined CPU architecture

and optimization, localization, pseudovectors and Grassman algebra, dual quaternions, SIMD vector math, memory alignment, and anti-aliasing Insight into the making of Naughty Dog's latest hit, *The Last of Us* The book presents the theory underlying various subsystems that comprise a commercial game engine as well as the data structures, algorithms, and software interfaces that are typically used to implement them. It primarily focuses on the engine itself, including a host of low-level foundation systems, the rendering engine, the collision system, the physics simulation, character animation, and audio. An in-depth discussion on the "gameplay foundation layer" delves into the game's object model, world editor, event system, and scripting system. The text also touches on some aspects of gameplay programming, including player mechanics, cameras, and AI. An awareness-building tool and a jumping-off point for further learning, *Game Engine Architecture, Second Edition* gives readers a solid understanding of both the theory and common practices employed within each of the engineering disciplines covered. The book will help readers on their journey through this fascinating and multifaceted field.

*A Hands-On Guide to Game Creation* Apress

The Unity Engine Tutorial for Any Game Creator  $\zeta$  Unity is now the world's #1 game engine, thanks to its affordability, continuous improvements, and amazing global community. With Unity, you can design, code, and author your game once, and then deploy it to multiple platforms, reaching huge audiences and earning maximum returns. *Learning 2D Game Development with Unity®* will help you master Unity and build powerful skills for success in today's game industry. It also includes a bonus rundown of the new GUI tools introduced in Unity's version 4.6 beta.  $\zeta$  With this indispensable guide, you'll gain a solid, practical understanding of the Unity engine as you build a complete, 2D platform-style game, hands-on. The step-by-step project will get you started fast, whether you're moving to Unity from other engines or are new to game development.  $\zeta$  This tutorial covers the entire development process, from initial concept, plans, and designs to the final steps of building and deploying your game. It illuminates Unity's newly integrated 2D toolset, covering sprites, 2D physics, game scripts, audio, and animations. Throughout, it focuses on the simplest and lowest-cost approaches to game development, relying on free software and assets. Everything you'll need is provided.  $\zeta$  Register your book at [informit.com/title/9780321957726](http://informit.com/title/9780321957726) to access assets, code listings, and video tutorials on the companion website.  $\zeta$  Learn How To Set up your Unity development environment and navigate its tools Create and import assets and packages you can add to your game Set up game sprites and create atlas sheets using the new Unity 2D tools Animate sprites using keyframes, animation controllers, and scripting Build a 2D game world from beginning to end Establish player control Construct movements that "feel right" Set up player physics and colliders Create and apply classic gameplay systems Implement hazards and tune difficulty Apply audio and particle effects to the game Create intuitive game menus and interface elements Debug code and provide smooth error handling Organize game resources and optimize game performance Publish your game to the web for others to see and play  $\zeta$

*Game Development with MonoGame* Apress

2D games are hugely popular across a wide range of platforms and the ideal place to start if you're

new to game development. With *Learn 2D Game Development with C#*, you'll learn your way around the universal building blocks of game development, and how to put them together to create a real working game. C# is increasingly becoming the language of choice for new game developers. Productive and easier to learn than C++, C# lets you get your games working quickly and safely without worrying about tricky low-level details like memory management. This book uses MonoGame, an open source framework that's powerful, free to use and easy to handle, to further reduce low-level details, meaning you can concentrate on the most interesting and universal aspects of a game development: frame, camera, objects and particles, sprites, and the logic and simple physics that determines how they interact. In each chapter, you'll explore one of these key elements of game development in the context of a working game, learn how to implement the example for yourself, and integrate it into your own game library. At the end of the book, you'll put everything you've learned together to build your first full working game! And what's more, MonoGame is designed for maximum cross-platform support, so once you've mastered the fundamentals in this book, you'll be ready to explore and publish games on a wide range of platforms including Windows 8, MAC OSX, Windows Phone, iOS, Android, and Playstation Mobile. Whether you're starting a new hobby or considering a career in game development, *Learn 2D Game Development with C#* is the ideal place to start. What you'll learn

Know your way around the world of game design and the process of designing a game from scratch. Understand the basic architecture of a 2D game engine and develop your own game library. Work with the MonoGame framework and use it to build your own 2D interactive games. Learn and implement simple in-game pseudo autonomous behaviors. Understand and implement the math and physics underlying realistic game interactions. Give your game impact with graphic effects, and audio and special effects. Who this book is for This book is perfect for game enthusiasts, hobbyists, and anyone who is interested in building interactive games but is unsure of how to begin. It assumes no background in computer graphics or game development, but readers should be familiar with C# or another object-oriented language. Table of Contents

Introducing 2D Game Development in C# Getting to Know the MonoGame Framework 2D Graphics, Coordinates, and Game State Getting Things Moving Pixel-Accurate Collisions Game Object States and Semiautonomous Behaviors Sprites, Camera, Action! Particle Systems Building Your First 2D Game

*How to Build a Robust Commercial-Grade Physics Engine for your Game* Apress

If you have C# knowledge but now want to become truly confident in creating fully functional 2D RPG games with Unity, then this book will show you everything you need to know.

[Advanced 2D Game Development](#) Jones & Bartlett Publishers

Learn the fundamentals of Godot by diving headfirst into creating a 2D platformer from scratch. This book is a hands-on, practical guide to developing 2D games using the Godot Engine 3.2.3/3.3, with the help of GDScript. Author Maithili Dhule begins by explaining some basic tools and techniques used to make games, the factors that need to be considered while choosing a game engine, and pointing out the benefits of using Godot. She then walks you through downloading the engine and guides you as you explore key features of its interface. Next, you'll receive a concise introduction to the basics of GDScript, the main scripting language used in Godot, before moving on to essential topics such as Godot's node-scene architecture, the interaction of various physics bodies, the

creation of game scenes, and writing scripts. As the book progresses, you'll learn how to create and animate your game character, design the game world, add enemies, and implement a coin-collection system. You'll also see how the user's gaming experience can be enhanced through the addition of parallax backgrounds, a title screen, music, and sound effects. Toward the end of the book, you'll learn how to export your game to different platforms, both mobile and PC, as well as possible avenues for monetizing the game. Throughout the book, theoretical concepts are supplemented with concrete, ready-to-implement examples that you can try out. Upon finishing this book, you'll be able to make and publish your first 2D platform game. *Beginning Game Development with Godot* is for game development enthusiasts of all levels interested in creating their own games. What You Will Learn Understand the Godot engine and the benefits of using it for game development Master the fundamentals of programming in GDScript Use the Godot graphical interface to design and animate players, the game world, menus, and various games scenes Create your first 2D game in Godot and publish it to various platforms Who This Book Is For Aspiring game developers who may be new to game development, as well as experts exploring the potential of the Godot Engine.

**Game Development Patterns and Best Practices** Packt Publishing Ltd

Develop a 2D game engine that will give you the experience and core understanding of foundational concepts for building complex and fun 2D games that can be played across the Internet via popular web browsers. This book is organized so that the chapters follow logical steps of building a game engine and integrates concepts accordingly. *Build Your Own 2D Game Engine and Create Great Web Games* isolates and presents relevant concepts from software engineering, computer graphics, mathematics, physics, game development and game design in the context of building a 2D game engine from scratch. In this edition, all the code is based on updated versions of JavaScript with HTML5 and WebGL2: you will analyze the source code needed to create a game engine that is suitable for implementing typical casual 2D videogames. You will also learn about physics and particle system. The discussion of physics component includes rotations and popular physical materials such as wood, mud, and ice. The discussion of particle component has popular presets such as fire, smoke, and dust. By the end of the book, you will understand the core concepts and implementation details of a typical 2D game engine, learn insights into how these concepts affect game design and game play, and have access to a versatile 2D game engine that they can expand upon or utilize to build their own 2D games from scratch with HTML5, JavaScript, and WebGL2. What You Will Learn Understand essential concepts for building 2D games Grasp the basic architecture of 2D game engines Understand illumination models in 2D games Learn basic physics used in 2D games Find out how these core concepts affect game design and game play Learn to design and develop 2D interactive games Who Is This Book For Game enthusiasts, hobbyists, and anyone with little to no experience who are interested in building interactive games but are unsure of how to begin. This can also serve as a textbook for a junior- or senior-level "Introduction to Game Engine" course in a Computer Science department.

*Learn to Design, Implement, and Use a Cross-Platform 2D Game Engine* Apress

Provides information on creating a computer game using object-oriented programming with Python. *Game Physics Engine Development* O'Reilly Media

Physics is really important to game programmers who need to know how to add physical realism to

their games. They need to take into account the laws of physics when creating a simulation or game engine, particularly in 3D computer graphics, for the purpose of making the effects appear more real to the observer or player. The game engine needs to recognize the physical properties of objects that artists create, and combine them with realistic motion. The physics ENGINE is a computer program that you work into your game that simulates Newtonian physics and predict effects under different conditions. In video games, the physics engine uses real-time physics to improve realism. This is the only book in its category to take readers through the process of building a complete game-ready physics engine from scratch. The Cyclone game engine featured in the book was written specifically for this book and has been utilized in iPhone application development and Adobe Flash projects. There is a good deal of master-class level information available, but almost nothing in any format that teaches the basics in a practical way. The second edition includes NEW and/or revised material on collision detection, 2D physics, casual game physics for Flash games, more references, a glossary, and end-of-chapter exercises. The companion website will include the full source code of the Cyclone physics engine, along with example applications that show the physics system in operation.

[Learning 2D Game Development with Unity](#) CRC Press

2D games are everywhere, from mobile devices and websites to game consoles and PCs. Timeless and popular, 2D games represent a substantial segment of the games market. In *Learn Unity for 2D Game Development*, targeted at both game development newcomers and established developers, experienced game developer Alan Thorn shows you how to use the powerful Unity engine to create fun and imaginative 2D games. Written in clear and accessible language, *Learn Unity for 2D Game Development* will show you how to set up a step-by-step 2D workflow in Unity, how to build and import textures, how to configure and work with cameras, how to establish pixel-perfect ratios, and all of this so you can put that infrastructure to work in a real, playable game. Then the final chapters show you how to put what you've already made to work in creating a card-matching game, plus you'll learn how to optimize your game for mobile devices.

*Introduction to Video Game Engine Development* Packt Publishing Ltd

A First Course in Game Programming Most of today's commercial games are written in C++ and are created using a game engine. Addressing both of these key elements, *Programming 2D Games* provides a complete, up-to-date introduction to game programming. All of the code in the book was carefully crafted using C++. As game programming techniques are introduced, students learn how to incorporate them into their own game engine and discover how to use the game engine to create a complete game. Enables Students to Create 2D Games The text covers sprites, animation, collision detection, sound, text display, game dashboards, special graphic effects, tiled games, and network programming. It systematically explains how to program DirectX applications and emphasizes proper software engineering techniques. Every topic is explained theoretically and with working code examples. The example programs for each chapter are available at [www.programming2dgames.com](http://www.programming2dgames.com).

[Game Engine Design and Implementation](#) Apress

A guide to Java game programming techniques covers such topics as 2D and 3D graphics, sound, artificial intelligence, multi-player games, collision detection, game scripting and customizing

keyboard and mouse controls.

[Learn Unity for 2D Game Development](#) Apress

Learn everything you need to know to build a 2D game using Unity 5 by developing a complete RPG game framework! About This Book\* Explore the new features of Unity 5 and recognize obsolete code and elements.\* Develop and build a complete 2D retro RPG with a conversation system, inventory, random map battles, full game menus, and sound.\* This book demonstrates how to use the new Unity UI system effectively through detailed C# scripts with full explanations. Who This Book Is For This book is for anyone looking to get started developing 2D games with Unity 5. If you're already accomplished in Unity 2D and wish to expand or supplement your current Unity knowledge, or are working in 2D in Unity 4 and looking to upgrade Unity 5, this book is for you. A basic understanding of programming logic is needed to begin learning with this book, but intermediate and advanced programming topic are explained thoroughly so that coders of any level can follow along. Previous programming experience in C# is not required. What You Will Learn\* Work with 2D sprite assets from importing and animation to physics and programming.\* Write beginner to advanced level C# code using MonoDevelop.\* Create a 2D game in Unity 5 by developing a complete retro 2D RPG.\* Implement the new UI system effectively and beautifully.\* Publish, monetize, and advertise a game on multiple platforms. In Detail The inclusion of 2D support in Unity has brought 2D games back to the forefront of the gaming industry, with indie game developers and hobbyists finding 2D creation and development easier than ever. This book will help you master the 2D features available in Unity 5 by walking you through the full development of a retro 2D RPG. You will see by example how to work with 2D art assets, create C# scripts, develop animations, and implement Unity's new and improved UI tools. You will learn how to program, develop, and animate a conversation system, a battle system, and an inventory system all using the new and improved Unity UI and 2D animation tools. After completing this book, you will have the knowledge necessary to develop, build, deploy, and sell 2D games of any genre!

**Build your own 2D Game Engine and Create Great Web Games** CRC Press

Start your video game development journey by learning how to build a 2D game engine from scratch. Using Java (with NetBeans as your IDE and using Java's graphics framework) or by following along in C# (with Visual Studio as your IDE and using the MonoGame framework), you'll cover the design and implementation of a 2D game engine in detail. Each class will be reviewed with demonstration code. You'll gain experience using the engine by building a game from the ground up. *Introduction to Video Game Engine Development* reviews the design and implementation of a 2D game engine in three parts. Part 1 covers the low-level API class by class. You'll see how to abstract lower-level functionality and design a set of classes that interact seamlessly with each other. You'll learn how to draw objects, play sounds, render text, and more. In Part 2, you'll review the mid-level API that is responsible for drawing the game, loading resources, and managing user input. Lastly, in Part 3, you'll build a game from the ground up following a step-by-step process using the 2D game engine you just reviewed. On completing this book, you'll have a solid foundation in video game engine design and implementation. You'll also get exposure to building games from scratch, creating the solid foundation you'll need to work with more advanced game engines, and industry tools, that require learning complex software, APIs, and IDEs. What You Will Learn Gain experience



with lower-level game engine APIs and abstracting framework functionality Write application-level APIs: launching the game, loading resources, settings, processing input, and more Discover cross-platform APIs in the game engine projects written in both Java and C#/MonoGame Develop games with an SDK-based game engine and simplified tool chain focused on direct control of the game through code Master creating games by using the game engine to build a game from the ground up with only code and an IDE Who This Book Is For Those of you out there with some programming experience, moderate to advanced, who want to learn how to write video games using modern game engine designs.

#### **Moving from Unity to Godot** New Riders

Master the most important skills and techniques you need to know for professional HTML5 and JavaScript 2D game development. This book delves into many of the great classic techniques of video game design. You'll discover how to develop games and game levels using Tiled Editor, how to implement tile-based collision, how to design advanced pathfinding and enemy AI systems, the fundamentals of broad-phase collision, and how to make isometric games. All the techniques and supporting code are explained in an easy-to-understand manner and written in a general way so that they can be applied to any game engine or technology that you're comfortable using. You'll find detailed working examples, with dozens of illustrations and many concepts you can freely apply to your own projects. All the math and programming techniques are elaborately explained and examples are open-ended to encourage you to think of original ways to use these techniques in your own games. You can use what you learn in this book as the basis for making games for desktops, mobile phones, tablets, or the Web. The Advanced Game Developer's Toolkit is a great next step if you already have some JavaScript game-making- experience, or a great continuation if you've already read Advanced Game Design with HTML5 and JavaScript by the same author. What You'll Learn Work with advanced tile-based design techniques for puzzle, platform and maze games Use Tiled Editor to build game worlds Build path-finding and AI systems using Line of Sight and A\* (A-Star) Make isometric games Manage complexity to build games of any size that scale seamlessly Who This Book Is For Video game developers with some experience who want to learn the essential techniques they need to know to take their skills to the next level and for readers who want to understand and fine-tune every line of code they write, without resorting to quick fixes.

#### *Mastering Unity 2D Game Development - Second Edition* Apress

Physics is really important to game programmers who need to know how to add physical realism to their games. They need to take into account the laws of physics when creating a simulation or game engine, particularly in 3D computer graphics, for the purpose of making the effects appear more real to the observer or player. The game engine needs to recognize the physical properties of objects that artists create, and combine them with realistic motion. The physics ENGINE is a computer program that you work into your game that simulates Newtonian physics and predict effects under different conditions. In video games, the physics engine uses real-time physics to improve realism. This is the only book in its category to take readers through the process of building a complete game-ready physics engine from scratch. The Cyclone game engine featured in the book was written specifically for this book and has been utilized in iPhone application development and Adobe Flash projects. There is a good deal of master-class level information available, but almost nothing in any format

that teaches the basics in a practical way. The second edition includes NEW and/or revised material on collision detection, 2D physics, casual game physics for Flash games, more references, a glossary, and end-of-chapter exercises. The companion website will include the full source code of the Cyclone physics engine, along with example applications that show the physics system in operation.

#### **Create Amazing Web-based Games with JavaScript and HTML5** Apress

Learn to build a fully-functional 2D game inspired by the 1979 Atari classic, Asteroids, using just HTML5, CSS and JavaScript. Developing games has never been easier than it is now. New web technology allows even beginner developers to turn their hand to game development. Developed from an undergraduate course module, Introducing JavaScript Game Development teaches each new technology as it is introduced so can be followed by enthusiastic beginners as well as intermediate coders. You will learn how to work with HTML5 and the canvas element, how to understand paths, how to draw to a design and create your spaceship and asteroids. You'll then move on to animating your game, and finally building. You will work step-by-step through the game design process, starting with only what is necessary to complete each step, and refactoring the code as necessary along the way, reflecting the natural progression that code follows in the real world. Each chapter is designed to take your code base to the next level and to add to your skills. After completing the examples in this book you will have the tools necessary to build your own, high-quality games. Make the process of creating object-oriented 2D games more fun and more productive and get started on your game development journey.

#### **Creating 2D Games with Unity** Packt Publishing Ltd

2D games are hugely popular across a wide range of platforms and the ideal place to start if you're new to game development. With Learn 2D Game Development with C#, you'll learn your way around the universal building blocks of game development, and how to put them together to create a real working game. C# is increasingly becoming the language of choice for new game developers. Productive and easier to learn than C++, C# lets you get your games working quickly and safely without worrying about tricky low-level details like memory management. This book uses MonoGame, an open source framework that's powerful, free to use and easy to handle, to further reduce low-level details, meaning you can concentrate on the most interesting and universal aspects of a game development: frame, camera, objects and particles, sprites, and the logic and simple physics that determines how they interact. In each chapter, you'll explore one of these key elements of game development in the context of a working game, learn how to implement the example for yourself, and integrate it into your own game library. At the end of the book, you'll put everything you've learned together to build your first full working game! And what's more, MonoGame is designed for maximum cross-platform support, so once you've mastered the fundamentals in this book, you'll be ready to explore and publish games on a wide range of platforms including Windows 8, MAC OSX, Windows Phone, iOS, Android, and Playstation Mobile. Whether you're starting a new hobby or considering a career in game development, Learn 2D Game Development with C# is the ideal place to start.

#### MonoGame Mastery Packt Publishing Ltd

Rust is an exciting new programming language combining the power of C with memory safety,

fearless concurrency, and productivity boosters - and what better way to learn than by making games. Each chapter in this book presents hands-on, practical projects ranging from "Hello, World" to building a full dungeon crawler game. With this book, you'll learn game development skills applicable to other engines, including Unity and Unreal. Rust is an exciting programming language combining the power of C with memory safety, fearless concurrency, and productivity boosters. With Rust, you have a shiny new playground where your game ideas can flourish. Each chapter in this book presents hands-on, practical projects that take you on a journey from "Hello, World" to building a full dungeon crawler game. Start by setting up Rust and getting comfortable with your

development environment. Learn the language basics with practical examples as you make your own version of Flappy Bird. Discover what it takes to randomly generate dungeons and populate them with monsters as you build a complete dungeon crawl game. Run game systems concurrently for high-performance and fast game-play, while retaining the ability to debug your program. Unleash your creativity with magical items, tougher monsters, and intricate dungeon design. Add layered graphics and polish your game with style. What You Need: A computer running Windows 10, Linux, or Mac OS X. A text editor, such as Visual Studio Code. A video card and drivers capable of running OpenGL 3.2.

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