WHY C++ IS BEST FOR GAME DEVELOPMENT ?

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ABOUT C++

- C++ IS A CROSS-PLATFORM LANGUAGE THAT CAN BE USED TO CREATE HIGH-PERFORMANCE APPLICATIONS.
- C++ WAS DEVELOPED BY BJARNE STROUSTRUP, AS AN EXTENSION TO THE C LANGUAGE.
- C++ GIVES PROGRAMMERS A HIGH LEVEL OF CONTROL OVER SYSTEM RESOURCES AND MEMORY.
- THE LANGUAGE WAS UPDATED 4 MAJOR TIMES IN 2011, 2014, 2017, AND 2020 TO C++11, C++14, C++17, C++20.

KEY FEATURE OF C++ PROGRAMMING LANGUAGE

- OBJECT-ORIENTED
- SIMPLE
- COMPILER BASED
- POWERFUL AND FAST.
- A MID-LEVEL PROGRAMMING LANGUAGE
- PLATFORM DEPENDENT
- STRUCTURED PROGRAMMING LANGUAGE.
- MEMORY MANAGEMENT
- RICH LIBRARY
- POINTERS
- SYNTAX BASED LANGUAGE

SHOULD YOU USE C++ FOR GAME DEVELOPMENT IN MODERN TIMES

- THE C++ PROGRAMMING LANGUAGE WAS DEVELOPED IN 1979 AND CONTINUES TO BE USED FOR GAME DEVELOPMENT TO THIS DAY.

- WITH NEWER LANGUAGES LIKE JAVA BEING USED FOR GAME DEVELOPMENT, BEGINNER DEVELOPERS MIGHT WONDER IF THEY SHOULD LEARN AN OLDER LANGUAGE LIKE C++.

- OUR ANSWER IS YES. IN FACT, WE RECOMMEND THAT YOU LEARN C++ EVEN IF YOU AREN'T INTERESTED IN GAME DEVELOPMENT.

C++ IN THE GAMING INDUSTRY

- GAME DEVELOPERS HAVE BEEN BUILDING GAMES WITH C++ FOR DECADES. C++ ALLOWS YOU TO DEVELOP GAMES ACROSS VARIOUS PLATFORMS, INCLUDING WINDOWS, MAC, LINUX, ANDROID, AND IOS.
- YOU NEED A GAME ENGINE TO CREATE GAMES, AND C++ IS USED IN NUMEROUS 2D GAME ENGINES AND 3D GAME ENGINES.
- GODOT AND UNREAL ENGINE, FOR INSTANCE, USE C++ AS THEIR SCRIPTING LANGUAGE. THE UNITY GAME ENGINE IS WRITTEN IN C#, BUT ITS RUNTIME LANGUAGE IS C++.
- BY NOW, MANY GAMING APIS ARE WRITTEN IN C++. ITS POPULARITY IS NOT THE REASON IT'S GREAT FOR GAME DEVELOPMENT, THOUGH.

C++ PROGRAMMING REVOLUTION FOR GAME DEVELOPMENT

- FOR YEARS, GAME DEVELOPERS HAVE USED C++ PROGRAMMING TO CREATE GAMES. C++ ALLOWS USERS TO CREATE GAMES FOR WINDOWS, LINUX, MAC, ANDROID, AND IOS, AMONG OTHER PLATFORMS.
- TO MAKE GAMES, YOU'LL NEED A GAME ENGINE, AND C++ IS USED IN MANY 2D AND 3D GAME ENGINES.
- C++ IS THE SCRIPTING LANGUAGE USED BY GODOT AND UNREAL ENGINE, FOR EXAMPLE. ALTHOUGH THE UNITY GAME ENGINE IS BUILT-IN C#, IT IS OPERATED IN C++.
- MANY GAME APIS ARE NOW DEVELOPED IN C++. ITS POPULARITY, HOWEVER, IS NOT THE REASON IT IS IDEAL FOR GAME CREATION.

C++ VS OTHER COMMON GAME PROGRAMMING LANGUAGES

- C++ IS A HIGH PERFORMER WHEN COMPARED TO OTHER LANGUAGES USED FOR GAME DEVELOPMENT.
- OTHER POPULAR GAME PROGRAMMING LANGUAGES INCLUDE PYTHON, JAVA, C, AND C#.
- WHILE C IS ANOTHER LOW-LEVEL LANGUAGE USED TO PROGRAM GAMES, THE FOCUS OF OUR COMPARISON WILL BE THE HIGHER-LEVEL LANGUAGES IN THE RUNNING AGAINST C++. THESE ARE PYTHON, JAVA, AND C#.

EXAMPLES OF C++ VIDEO GAMES

THE TEAM AT BLIZZARD WAS VERY FAMILIAR WHEN IT COMES TO CREATING GAMES CODED IN C++ WHEN THEY MADE WORLD OF WARCRAFT, THE PC GAMING SENSATION THAT TOOK THE WORLD BY STORM. SIMILARLY, GRAND THEFT AUTO: VICE CITY IN PARTICULAR A FEW EXAMPLES OF C++ VIDEO GAMES.

COUNTER-STRIKE, DIABLO 2, DOOM–ESSENTIALLY IF IT IS A AAA GAMING TITLE, THE CREATORS USED C++ AT SOME POINT DURING THE DEVELOPMENT PROCESS. GAMES ALWAYS WANT TO RUN AS FAST AS POSSIBLE, AND GAMES MADE WITH C++ ARE LOOKING EXACTLY FOR THAT.

HERE'S A LIST OF POPULAR GAMES MADE IN C++:

- MORTAL KOMBAT 11
- BATMAN ARKHAM ORIGINS
- HALF-LIFE 2
- PORTAL
- LEFT 4 DEAD

- LET’S COMPARE HOW THESE LANGUAGES PERFORMED IN A GENERIC PROGRAM: BINARY-TREES.
- THE BINARY-TREES PROGRAM ALLOCATES, TRAVERSES, AND DEALLOCATES SEVERAL BINARY TREES, WHICH ARE TREE DATA STRUCTURES.
- C++ OUTPERFORMED JAVA, C#, AND PYTHON WITH THE FASTEST RUNTIME OF 1,129 MILLISECONDS.

Programming language	Time (ms)
C++	1,129
Java	3,306
C#	10,797
Python	45,003

WHY YOU SHOULD LEARN C++ FOR GAME DEVELOPMENT

- C++ HAS STARK ADVANTAGES FOR GAME DEVELOPMENT WHEN IT COMES TO ENSURING HIGH PERFORMANCE.

- HIGH PERFORMANCE (I.E. MINIMUM LATENCY) IS AN ESSENTIAL REQUIREMENT FOR GAME DESIGN. DURING GAMEPLAY, SEVERAL OBJECTS NEED TO MOVE IN A GIVEN SECOND. EVEN ONE EXTRA SECOND OF LAG CAN BREAK IMMERSION FOR GAME PLAYERS.

- BECAUSE C++ ALLOWS YOU TO SPEAK TO MACHINE HARDWARE, YOU CAN MANIPULATE HARDWARE AND CONTROL MEMORY MANAGEMENT TO OPTIMIZE APPLICATIONS FOR SPEED.

- ANYONE WHO'S SERIOUS ABOUT WORKING IN THE GAME INDUSTRY SHOULD LEARN C++. C++ CODE ALLOWS YOU TO SPEAK DIRECTLY TO HARDWARE AND OPTIMIZE YOUR APPLICATIONS IN WAYS THAT AREN'T POSSIBLE WHEN USING HIGHER-LEVEL LANGUAGES. THIS ABILITY TO TAKE OWNERSHIP OF HARDWARE COMPONENTS WILL MAKE YOU A MORE NIMBLE AND COMPETITIVE GAME PROGRAMMER.

- IF YOU'RE NOT INTERESTED IN GAME DEVELOPMENT, YOU SHOULD LEARN C++ ANYWAY. WHETHER YOU'RE ALREADY A SOFTWARE ENGINEER OR NEW TO SOFTWARE DEVELOPMENT.

- THERE'S A LOT TO GAIN FROM LEARNING AN INTERMEDIATE LANGUAGE LIKE C++. YOU'LL UNDERSTAND FAR MORE ABOUT HOW COMPUTERS OPERATE BECAUSE OF ITS LOW-LEVEL LANGUAGE COMPONENTS.

THIS IS WHY DEVELOPERS USE C++ FOR DEVELOPING GAMES

- THIS LANGUAGE IS FULLY COMPATIBLE WITH SEVERAL POPULAR GAMING ENGINES LIKE UNITY, UNREAL, AND OTHERS.
- C++ IS COMPATIBLE WITH LOW-LEVEL C A AND ASSEMBLY LANGUAGE, MAKING IT EASIER FOR DEVELOPERS.
- IT IS A COMPILED LANGUAGE THAT GIVES BETTER RUN-TIME PERFORMANCE.
- IT HAS A WIDE VARIETY OF LIBRARIES THAT SUPPORT DEVELOPING HIGH-PERFORMING GAMES.

- C++ PRODUCES NATIVE CODE THAT RUNS THE QUICKEST OF ALL THE LANGUAGES PROGRAMMERS USE. THIS LANGUAGE PERFORMS WELL WHEN COMPARED TO OTHERS IN TERMS OF GRAPHICS. HIGH FRAME RATES AND RESPONSIVENESS ARE ESSENTIAL WHEN CREATING CONSOLE GAMES, AND C++ IS CRUCIAL FOR IT.

- IT HAS THE BEST HARDWARE FEATURE AVAILABILITY, DIRECTLY CONNECTED TO PERFORMANCE. CONSOLE MANUFACTURERS PRIMARILY CHOOSE C++-BASED APIS FOR THEIR HARDWARE SINCE THEY IMPROVE OVERALL PERFORMANCE.

- IF YOU USE OTHER LANGUAGES LIKE C, THEN IT AFFECTS YOUR PRODUCT. ALTHOUGH C++ OFFERS LOW-LEVEL ACCESS TO HARDWARE BUT STILL OFFERS CONTEMPORARY FEATURES OF OTHER PROGRAMMING LANGUAGES THAT ARE CRUCIAL.

IS C++ HARD TO LEARN FOR GAME DEVELOPMENT ?

- DUE TO THE VARIETY OF PARADIGMS IT SUPPORTS, C++ IS ONE OF THE MOST CHALLENGING PROGRAMMING LANGUAGES TO MASTER.
- YOU CAN BETTER UNDERSTAND ITS COMPLEX GRAMMAR AND SCALE BY DRAWING ON YOUR PRIOR EXPERIENCE. EVEN EXPERIENCED PROGRAMMERS MAY FIND C++ CHALLENGING.
- YOU MIGHT FIRST BECOME FAMILIAR WITH OTHER PROGRAMMING LANGUAGES IN ORDER TO LEARN C++ MORE EASILY.
- THE C++ PROGRAMMING LANGUAGE IS INCREDIBLY FLEXIBLE. MANY PEOPLE FIND IT CHALLENGING TO UNDERSTAND C++ CONCEPTS SINCE C++ ASPIRES TO BE EFFICIENT RATHER THAN SIMPLE TO LEARN.
- AS A BEGINNING PROGRAMMER, YOU MIGHT WANT TO UNDERSTAND C AND C# PROGRAMMING LANGUAGES, WHICH ARE SIMPLER PROGRAMMING LANGUAGES TO MASTER.

WHICH GAME ENGINES USE C++ PROGRAMMING ?

- GAME ENGINES PLAY A VITAL ROLE IN CREATING RICH-GAMING EXPERIENCES. THEY PROVIDE A WIDE ARRAY OF BUILT-IN FEATURES LIKE PHYSICS, INPUT, ASSET PROCESSING, AND RENDERING TO SUPPORT RAPID GAME DEVELOPMENT. DEVELOPERS USE DIFFERENT GAME ENGINES AS PER THEIR PRACTICAL REQUIREMENTS. BUT MOST GAME ENGINES USE C++ PROGRAMMING IN SOME FORM DUE TO FLEXIBLE MEMORY MANAGEMENT AND COMPATIBILITY WITH MACHINE-LEVEL CODE. HERE IS A LIST OF GAME ENGINES THAT EITHER SUPPORT C++ SCRIPTING OR HAVE A C++-COMPATIBLE CODEBASE.

- UNREAL ENGINE
- UNITY ENGINE
- CRYENGINE
- 4A ENGINE
- TORQUE3D

CONCLUSION

GAME DEVELOPMENT IS A VERY BROAD TOPIC THAT CAN BE APPROACHED IN MANY DIFFERENT WAYS. THERE ARE LOTS OF DIFFERENT TOOLS AND FRAMEWORKS AVAILABLE TO HELP YOU BUILD YOUR GAME, AND THERE ARE LOTS OF DIFFERENT AREAS OF GAME DEVELOPMENT THAT YOU CAN FOCUS ON.

C++ IS A VERY POWERFUL PROGRAMMING LANGUAGE THAT YOU CAN USE TO CREATE MANY DIFFERENT TYPES OF PROGRAMS. IT IS A NOTORIOUSLY COMPLEX LANGUAGE, BUT IT IS ALSO A VERY EASY LANGUAGE TO LEARN HOW TO PROGRAM WITH. IF YOU ARE INTERESTED IN LEARNING HOW TO PROGRAM GAMES, THEN C++ IS A GREAT LANGUAGE TO LEARN.

THANK YOU !