

Smart contracts

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In news—Apart from recording and verifying transactions, **some crypto blockchains like Ethereum let users launch agreements or special actions that execute on their own. These are known as smart contracts** and to create them effectively, programming languages are a must.

What are smart contracts?

- Smart contracts are simply **programs stored on a blockchain that run when predetermined conditions are met.**
- They **typically are used to automate the execution of an agreement** so that all participants can be immediately certain of the outcome, without any intermediary's involvement or time loss.
- They can also automate a workflow, triggering the next action when conditions are met.
- Crypto exchanges, decentralised apps (dApps), the automated buying or selling of orders, and even NFT-based games often rely on smart contracts to run smoothly.
- **A smart contract failure can cause platform outages, and exploitation of the codes** could devalue the entire ecosystem.

C++ language-

- **C++ is a programming language commonly associated with Bitcoin.**
- While the Bitcoin whitepaper explaining the peer-to-peer electronic cash system is written largely in English, the Bitcoin Core software, which makes transactions possible, uses C++.

- **It is maintained by a community anyone can join by running Bitcoin Core full nodes.**
- It is hailed for being an accessible programming language that users of Java, C, and C# can easily learn due to existing similarities.
- It is also one of the most used programming languages, playing a role in the development of operating systems like MacOS and Windows, gaming devices, search engines, and even machine learning.
- C++ is a major influence for many other programming languages in use today. However, some see C++ as an outdated programme. Mark Russinovich, Microsoft Azure's CT0, recently asked developers to stop using C and C++.

Other Programming languages-

Solidity, Rusk, Python and Haskell-

- **Solidity is the programming language mainly used on the blockchain platform Ethereum.**
- Some of **its developers are Ethereum co-founders.**
- The language is **influenced by C++, Python, and JavaScript.** It is also known as a 'curly bracket language' as it uses the flower bracket special character.
- Parts of the Ethereum ecosystem also support several other programming languages such as Python, Ruby, Rust, Java, and more.
- **Rust has the unique distinction of being called the "perfect programming language"** in 2021 by Twitter co-founder Jack Dorsey.
- In the crypto world, Rust is commonly associated with the Solana blockchain, which is known for its high speeds and relatively low transaction fees.
- Created by Dutch programmer Guido van Rossum, **Python is a general-purpose programming language.** Cryptocurrency is just one of its many use cases.

- **Python is used by developers who are interested in the Bitcoin Core as well as non-Bitcoin cryptocurrencies, known as alt coins.**
- Python's detailed library and graphic user interface options make it ideal for blockchain developers who are just entering the space to develop dApps.
- The programme can also be used widely by both Web3 and non-crypto-related app developers
- Some of the most valuable blockchain projects in the crypto industry don't necessarily rely on the most popular programming languages.
- **Cardano**, for example, is a blockchain that takes pride in its academic rigour and scholarly approach to the crypto sector.
- **Its smart contract programming language is based on Haskell.**
- **Haskell is classified as a purely functional programming language**, and is hard to learn. But it is said to be well-suited to deliver accurate crypto projects due to its immutability feature.