

# Learning Resources

Welcome to the Resources page. This is a list of links and pages that you might need to help you throughout your learning journey. If you're new to Chainlink, start with the [Getting Started](#) guide to better understand the products and services Chainlink offers. This page contains more resources, inspiration, and outreach information to further your learning.

## Smart contract learning materials

Videos, tutorials, examples, and bootcamps are a great way to get experience building smart contracts and using Chainlink products. The following learning materials are useful for expanding your knowledge.

### Video tutorials

We're constantly uploading new videos to our [YouTube](#) channel. Here are some direct links to playlists that may be helpful if you're starting your Chainlink learning journey or if you're looking for interesting ways to apply Chainlink to your project:

- [Two-Minute Explainers](#)
- [Chainlink Developer Workshops](#)
- [Chainlink Engineering Tutorials](#)
- [Solidity, Blockchain, and Smart Contract Python Course](#)
- [Chainlink Engineering YouTube](#)
- [Dapp University](#)
- [Austin Griffith](#)
- [Patrick Collins](#)
- [Nader Dabit](#)
- [Alchemy University](#)

## Applications

Below is a list of applications of Chainlink's products and services sorted by difficulty and type to help you navigate and search for projects that you might find interesting. See the [Chainlink Blog](#) to stay up to date with new ways to use Chainlink.

### Data feeds

Name	Type	Difficulty	How to Calculate Price Volatility for DeFi Variance Swaps	DeFi	Advanced	Build a dApp on Gnosis Chain (xDai) with Secure Data Feeds	DeFi	Medium	Craft Whiskey Crypto Payments With Chainlink Oracles	Payments	Advanced	Convert a Vending Machine to Accept Cryptocurrency Payments Using Chainlink Data Feeds	Payments	Advanced	Build a dApp on BNB Chain With Secure Data Feeds	DeFi	Medium	How to Use Chainlink With Hardhat	DeFi	Medium	Develop a DeFi Project Using Python	DeFi	Medium	Build a DeFi Call Option Exchange With Chainlink Data Feeds	DeFi	Advanced	Build a DeFi Yield Farming dApp Using Chainlink Data Feeds	DeFi	Advanced	Build and Deploy an Avalanche Smart Contract	DeFi	Beginner
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### Randomness (VRF)

Name	Type	Difficulty	How to Get a Random Number on Polygon	DeFi	Medium	Build Your Own Dynamic NFT With Hardhat	NFT	Advanced	Build, Deploy, and Sell Your Own Dynamic NFT	NFT	Advanced	How to Build a Blockchain Lottery	Gambling	Advanced
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### API requests

Name	Type	Difficulty	Build a Real Estate dApp With Chainlink Oracles	Real-Estate	Medium	Offchain Computation: Statistical Analysis With Chainlink	Statistical Analysis	Advanced	Blockchain Fintech Tutorial: Lending and Borrowing With Python	Lending	Medium	Build a Blockchain-Based Fantasy Sports Game Using a Chainlink External Adapter	Sports	Medium	Fetch IPFS Data in Smart Contracts Using a Chainlink External Adapter	Audius	Medium	How to Connect a Two-Factor Authentication (2FA) API to a Smart Contract With Chainlink	Security	Medium	Build a Marine Insurance Smart Contract With Chainlink	Insurance	Medium	How to Build a Parametric Insurance Smart Contract	Insurance	Advanced	Connect a Smart Contract to the Twitter API	Social Media	Advanced	Build an RFID Blockchain Integration With Chainlink External Adapters	Identification	Advanced	How to Connect a Tesla Vehicle API to a Smart Contract Via a Chainlink External Adapter	Transportation	Advanced	OAuth and API Authentication in Smart Contracts	Security	Advanced	Connect APIs to your Smart Contracts using Chainlink	NFT	Advanced
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### Automation

Name	Type	Difficulty	Automation Introduction Video	Automation	Beginner	Smart Contract Automation Master Class Module #1	Automation	Beginner	Smart Contract Automation Master Class Module #2	Automation	Beginner	Smart Contract Automation Master Class Module #3	Automation	Beginner	Smart Contract Automation Master Class Module
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[#4AutomationBeginnerEntropyfi Saves Engineering Hours with Chainlink AutomationGamingMediumEnabling Limit Orders on CivTrade With Chainlink AutomationTradingMediumPickle Finance UniV3 Jars Powered by Chainlink AutomationFinanceMediumJamonSwap Introduces New Limit Order Functionality Using Chainlink AutomationDeFiMediumHow Cratos used Chainlink Automation to automate the token vesting processDeFiMediumHow ApeSwap Integrated Chainlink Automation for BANANA Maximizer VaultsDeFiMedium](#)

## **Game resources**

- [CryptoZombies](#)
- [DamnVulnerableDefi](#)
- [Ethernaut](#)

## **Coding bootcamps**

- [ChainShot](#)
- [Consensys Bootcamp](#)
- [Ivan On Tech](#)

## **Starter kits**

Our Starter Kits help jumpstart your full-stack development process. You can get starter kits for Brownie (Python), Truffle (Javascript), and Hardhat (Javascript). See the[Engineering Tutorials](#) playlist to learn more about each kit and how to use them.

- [Chainlink Brownie Starter Kit \(Python\)](#)
- [Chainlink Truffle Starter Kit \(Javascript\)](#)
- [Chainlink Hardhat Starter Kit \(Javascript\)](#)

## **External tutorials**

- [Ethereum Developers](#)
- [useWeb3](#)

## **More inspiration**

Looking for more ways to use Chainlink? Here are some resources that discuss Chainlink's use cases as well as the winning projects we've had in our previous hackathons. There is also a link to the Marketplace where you can find the latest data provider nodes and explore the network.

- [77 Use Cases by Chainlink](#)
- [Blog posts featuring past hackathons and winners](#)

## **Outreach**

The Chainlink community is an inviting group of engineers that is always looking to help users expand their knowledge on Chainlink and solve related issues. Refer back to the[Getting Help](#) page for the latest information about how to get support.

## **Get support**

- [Stack Overflow](#)
- [Stack Exchange Ethereum](#)
- [Hackathon Discord](#)
- [Developer Discord](#)

## **Join the community**

- [Twitter](#)
- [Reddit](#)
- [Telegram](#)
- [Blog](#)