Framework

A framework in programming is a tool that provides ready-made components or solutions that are customized in order to speed up development.

A framework can include support programs, compilers, code libraries, toolsets, and APIs to develop software and create systems. Open-source frameworks are always being updated and improved.

Why do we use frameworks?

Using frameworks saves time and reduces the risk of errors You don't need to write everything from the ground up frameworks have already been tested

Difference between a Library, a Framework and an API

A **Library** is a chunk of code that you can call from your own code, to help you do things more quickly/easily

A **framework** is a big library or group of libraries that provides many services

An **API** (application programming interface) is a term meaning the functions/methods in a library that you can call to ask it to do things for you - the interface to the library.

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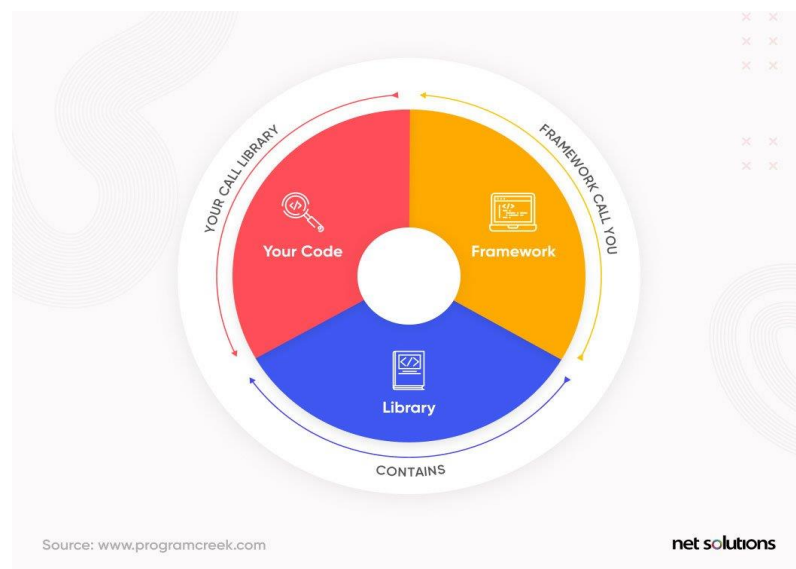
Types of frameworks

1-Web application frameworks

- AngularJS is a front-end JavaScript framework.
- is a back-end framework for Node.js
- Django is an open-source web development framework supported by the Django Software Foundation. It's written in Python
- Laravel is a PHP-based web application framework with an expressive, elegant syntax.

2-Mobile development frameworks

- Flutter is Google's open-source framework. It supports iOS and Android It uses a thin layer of C/C++ code, but most of its system is in Dart.
- Xamarin is a popular .NET-based framework by Microsoft
- React Native was developed by Facebook. It's open-source, cross-platform, and written in JavaScript
- Ionic is another open-source, cross-platform framework It uses JavaScript, HTML, and CSS,

3- Data Science Frameworks

- Apache Spark is a unified analytics engine for large-scale data processing. You can write applications quickly in Java, Scala, Python, R, and SQL using the Apache Spark.
- PyTorch is an open-source machine learning framework
- TensorFlow is an end-to-end open-source framework for machine learning (ML).

Framework advantages

- More secure code
- Simpler testing and debugging
- Avoiding duplicate code
- Clean and easily adaptable code
- Able to focus on writing code specific to the project • Can be extended