A framework is a structure that you can build software on. It serves as a foundation,

It's designed and tested by other Software Developers and Engineers, so you know it's a solid foundation.

you add higher-level functionality to it to make it work.

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

Other advantages include:

- 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

Difference between a Library and a Framework

Some may assume that a software framework is a collection of libraries just as libraries are a collection of precompiled routines. However, this is not true as not all software frameworks use or depend on libraries.

Frameworks can, and often do, include libraries. Libraries are used to fill out functions.

Library	Framework
Library is the collection of frequently used, pre-compiled classes.	Framework is the collection of libraries.
It is a set of reusable functions used by computer programs.	It is a piece of code that dictates the architecture of your project and aids in programs.
You are in full control when you call a method from a library and the control is then returned.	The code never calls into a framework, instead the framework calls you.
It is in corporate seamlessly into existing projects to add functionality that you can access using an API.	It cannot be seamlessly incorporated into an existing project. Instead it can be used when a new project is started.
They are important in program for linking and binding process.	They provide a standard way to build and deploy applications.
Libraries do no employ an inverted flow of control between itself and its clients.	Framework employs an inverted flow of control between itself and its clients.
Example: jQuery is a JavaScript library that simplifies DOM manipulation.	**Example:** Angular JS is a JavaScript-based framework for dynamic web applications.

Types of frameworks

1-Web application frameworks

AngularJS is a front-end JavaScript framework.

- Netflix
- Paypal
- Upwork
- Youtube

Express 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,

- Disqus
- Instagram
- Mozilla

Laravel

Laravel is a PHP-based web application framework with an expressive, elegant syntax. The open-source framework

- Alison.com
- Barchart.com
- Neighborhood Lender

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- DataScience Frameworks

1. Apache Spark

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.

- Amazon
- Cisco
- Databricks
- Hortonworks
- Microsoft
- Oracle

2. PyTorch

PyTorch is an open-source machine learning framework that accelerates the process from research and prototyping to production deploymen

- Comcast
- Exelon
- Trifo

- Quadient

3. TensorFlow

TensorFlow is an end-to-end open-source framework for machine learning (ML).