# Introduction

The growth and diversification of the specialty coffee industry have led to an overwhelming variety of flavors, beans, and brewing methods. This wide selection can make the process of choosing the perfect coffee a daunting task, particularly for consumers who may not be familiar with the subtleties of different coffee profiles. Furthermore, the increasing demand for personalized experiences has prompted the need for innovative tools to simplify and tailor the coffee selection process. In response to these challenges, this paper proposes an intelligent specialty coffee recommender system dedicated to the community coffee. By incorporating advanced machine reasoning techniques, this system aims to provide a user-friendly and efficient method for matching coffee drinkers to their ideal specialty coffee choices.

# Objective

The objective of the intelligent specialty coffee recommender system is to simplify and personalize the process of selecting specialty coffee for consumers by providing tailored recommendations based on their individual preferences, moods, or situational context. This system aims to achieve the following goals:

* Enhance User Experience: Simplify the coffee selection process by providing intuitive and personalized recommendations, making it more enjoyable for customers to explore specialty coffee options.
* Increase Customer Satisfaction: Offer tailored coffee suggestions that align with individual preferences, moods, or situations, resulting in a deeper connection between consumers and the community coffee brand.
* Foster Coffee Education: Share valuable knowledge about coffee production, quality, and flavor profiles, contributing to the growth and appreciation of the specialty coffee industry.
* Support Business Growth: Differentiate community coffee from competitors by offering a unique and value-added service, driving customer loyalty, repeat business, and attracting new customers.

# Literature Review

This literature review provides an overview of the key software components proposed for the intelligent specialty coffee recommender system, discussing their relevance and effectiveness within the context of the project, as well as incorporating additional software as needed.

## 1. Machine Learning Use Cases

a. Scikit-learn: Scikit-learn is an open-source Python library that provides a range of machine learning algorithms for classification, regression, clustering, and dimensionality reduction (Pedregosa et al., 2011). It is widely used in the machine learning community due to its simplicity, versatility, and robust performance. In the context of the intelligent specialty coffee recommender system, Scikit-learn can be employed for data preprocessing, feature extraction, and implementing various machine learning algorithms, including PCA and cosine similarity.

b. TensorFlow: TensorFlow is an open-source machine learning library developed by Google (Abadi et al., 2016). It is particularly known for its flexibility, performance, and support for deep learning models. In the context of the intelligent specialty coffee recommender system, TensorFlow can be used for developing more advanced algorithms, such as neural networks, to improve recommendation accuracy and effectiveness.

## 2. Frontend Technologies

a. Angular: Angular is a popular open-source web application framework developed by Google (Green & Seshadri, 2017). It enables the development of dynamic and responsive single-page applications (SPAs) using a component-based architecture. In the context of the intelligent specialty coffee recommender system, Angular can be considered as an alternative to React and Vue for creating a user-friendly and engaging user interface.

## 3. Backend Technologies

a. Flask: Flask is a lightweight web framework for Python that is known for its simplicity and flexibility (Ronacher, 2010). It allows for the rapid development of web applications and provides a range of extensions for tasks such as authentication, database integration, and form handling. In the context of the intelligent specialty coffee recommender system, Flask can be used alongside Python for implementing the backend logic and serving the machine learning models.

## 4. Data Storage and Management

a. PostgreSQL: PostgreSQL is a powerful, open-source object-relational database management system (ORDBMS) that offers robust performance, scalability, and a wide range of data types (Stonebraker & Rowe, 1986). In the context of the intelligent specialty coffee recommender system, PostgreSQL can be employed for storing and managing user preferences, coffee flavor profiles, and other relevant data.

b. Redis: Redis is an in-memory data structure store that can be used as a database, cache, and message broker (Carlson, 2013). Its high performance and low latency make it suitable for handling real-time data processing tasks. In the context of the intelligent specialty coffee recommender system, Redis can be utilized for caching and managing frequently accessed data to improve system performance and responsiveness.

## 5. Application Container

a. Kubernetes: Kubernetes is an open-source container orchestration platform that automates the deployment, scaling, and management of containerized applications (Burns et al., 2016). In the context of the intelligent specialty coffee recommender system, Kubernetes can be used alongside Docker for managing the deployment and scaling of the system across multiple environments and ensuring high availability.

In summary, the intelligent specialty coffee recommender system will utilize a range of software components, including Scikit-learn, TensorFlow, Angular, Flask, PostgreSQL, Redis, Docker, and Kubernetes. The combination of these technologies will ensure a robust, scalable, and efficient system capable of providing personalized coffee recommendations to users.