# PEAS

## Recommendation System

A recommendation system AI is a type of artificial intelligence that is designed to provide personalized recommendations to users based on their preferences, interests, and past behavior. These systems are commonly used in e-commerce, media streaming, and social media platforms to suggest products, movies, TV shows, music, and other content that the user is likely to enjoy.

### Performance measure

* **Accuracy** – how often the stem provides relevant recommendations to users
* **Personalization** – how well the system provides tailored recommendations to user’s specific preferences
* **Diversity** – how varied the recommendations are (wider range of options are preferred)
* **Novelty** – how often the system suggests new options
* **User satisfaction** – how happy is the user with recommendations
* **Revenue** – how much money the platform makes as result of user interaction with the system
* **Time spent on platform** – how long the user stays on the platform

### Environment

* **Observability –** for recommendation system, the environment is **partially observable.** What the system can observe is limited to the data collected from the user, which sometimes might not give us the whole picture about the user. Thus, there is degree of uncertainty that must be accounted for in recommendation process.
* **Single agent / Multiagent –** some recommendation systems are single agents, where the system only analyzes single users in isolation and characteristics of items to recommend. There are also multiagent recommendation systems, where the system could take others preferences to consideration when recommending items to user.
* **Determinism –** recommendation systems usually work in **nondeterministic environment.** User’s preferences could vary as a function of several circumstances.
* **Sequential –** the system is generally considered to operate in sequential environment than episodic environment. It continuously analyzes the user’s behavior and preferences in real-time which could affect future recommendations.
* **Dynamic –** the system operates in a dynamic environment that changes overtime. Contextual information change continuously that could affect user’s behavior.
* **Continuous –** user’s preference for certain item lies in a continuous spectrum thus the system is operating in continuous environment.
* **Unknown –** the recommendation system doesn’t know rules that will define user’s preferences, it has to learn it as it goes.

### Actuators

Recommendation system uses website, email or mobile apps as “actuators” to display recommended items. It can push notifications or send emails to users. They can display personalized ads.

### Sensors

In, recommendation systems we can consider inputs or data as sensors of the system.

* User rating and feedback
* Browsing and purchase history of user
* Demographic information
* Items characteristics
* Contextual information
* Social network data