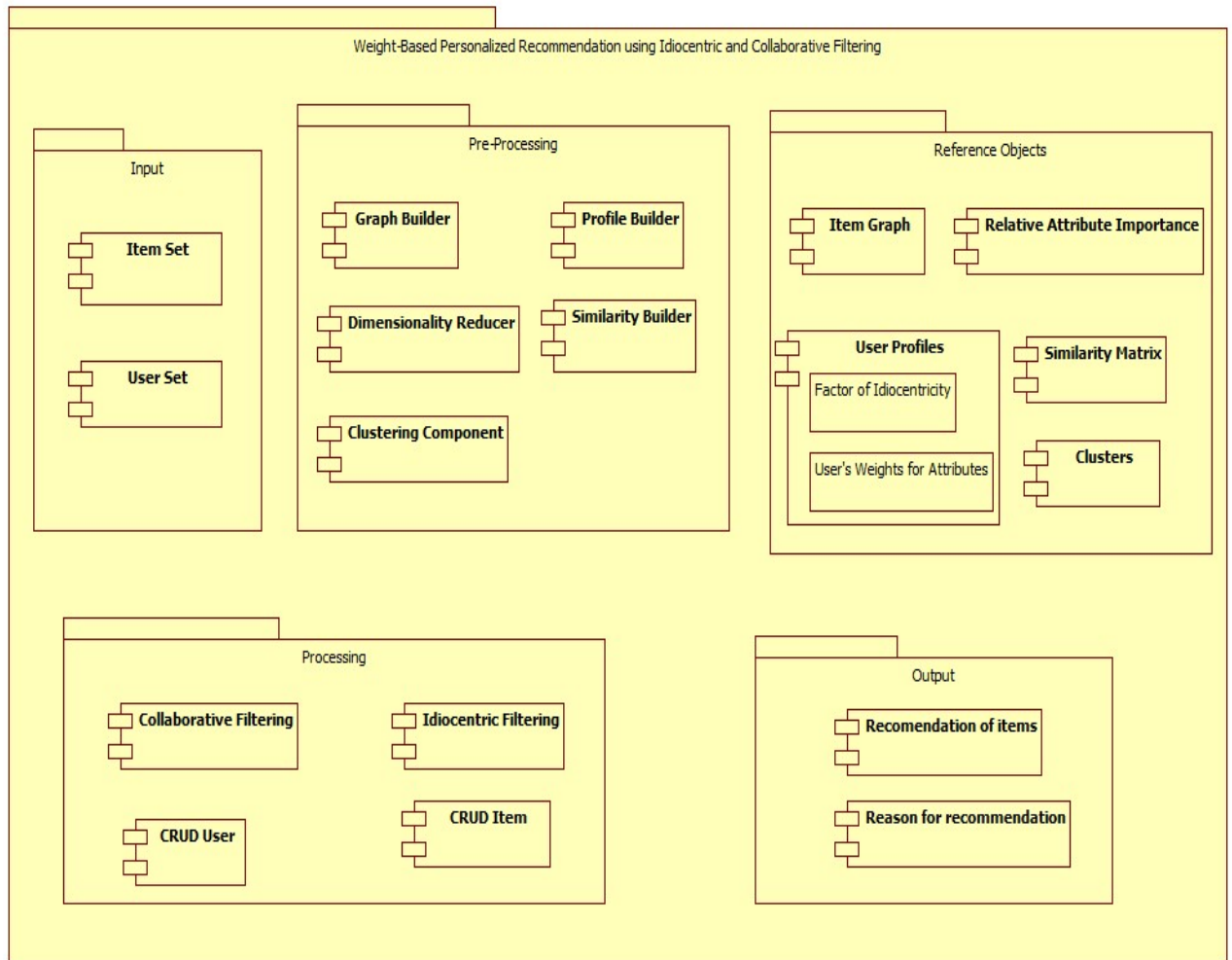


A WEIGHT BASED PERSONALIZED RECOMMENDATION USING IDIOCENTRIC AND COLLABORATIVE FILTERING

SYSTEM DESIGN

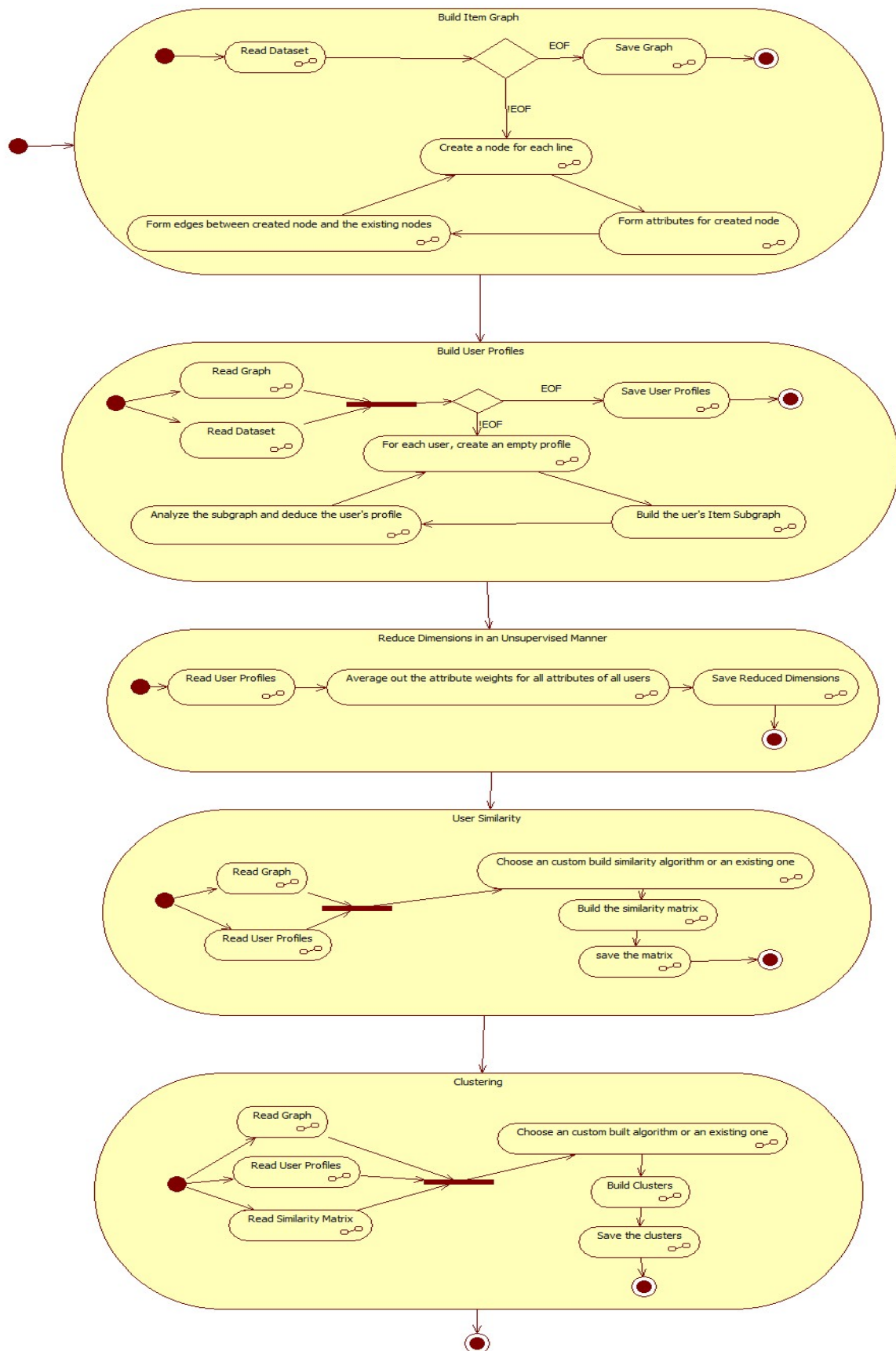
ALGORITHMIC FLOW:

Component Diagram:



- The above component diagram shows different components of our recommendation system. There are four different components, viz. Input, Pre processing, Processing and Output. The details of each component are as shown in the above figure.

Activity Diagram:



Algorithm:

1. Build Item graph:

- Item graph is built by reading the dataset and forming a graph data-structure that represents the relation between items. The attributes of items are mapped onto the attributes of the nodes.

2. Build User Profiles:

- In this step, user profiles are built by recognizing the relationship between users, the items they have consumed and the item graph. For each user, a set of properties are deduced that convey the orientation of the user and the relative attributive importance. The orientation of the user denotes the extent to which the user is idiocentric.

3. Reduction of Dimensionality in an unsupervised manner:

- The user's parameters include orientation of the user and the relative importance of attributes to the user. The item parameter includes the relative importance of the each attribute. These parameters can be used to perform dimensionality reduction of the attribute set for the items. Dimensionality Reduction for the item dataset is brought about by using the weight vector of each user and thus eliminating the redundant attributes in the item dataset by considering their average.

4. User Similarity:

- In order to perform collaborative filtering, we need to compute the similarity between all pairs of users. The algorithm that we intend to develop is a variation of Jaccard's Similarity, by taking a sub graph of items common to users.

5. Clustering:

- By considering the User similarity matrix and reading the user profiles along with the item graph, we build a cluster of users by choosing a custom built algorithm or an existing one. There may be overlapping clusters as a user can be a part of many clusters.

UI MOCKUP:

1. Start Up page:

The Start Up page of the Recommendation Engine features a blue header bar with the title "Recommendation Engine". Below the header, the interface is divided into several sections. On the left, there are two buttons: "Select Item Dataset.." and "Select User Dataset..", each followed by a text input field containing "<selected dataset>". Below these are two dropdown menus for "Similarity Algorithm:" and "Clustering Algorithm:", both set to "select an algorithm". A "Learn" button is positioned below the clustering algorithm dropdown. To the right of these controls is a large white rectangular area labeled "sample: loaded item graph". Further down on the right, there is an "Algorithm:" label with a "choose file.." button, and a "Type:" label with a "select a type" dropdown menu. At the bottom right, there is an "Add" button.

2. Processing Page:

The Processing Page of the Recommendation Engine has a blue header bar with the title "Recommendation Engine". The main content area is divided into two columns. The left column, titled "Item Dataset, User Dataset", contains a "User:" label with a "select a user" dropdown, followed by "Idiocentric Algorithm:" and "Collaborative Algorithm:" labels, each with a "select an algorithm" dropdown. Below these is a "Factor of Idiocentricity" label with a slider control. A "Recommend" button is located below the slider. At the bottom left, there is a "Modify Data:" label with an "Add/Remove Item/User" dropdown. The right column contains three large white rectangular areas. The top one is labeled "Items that the user has consumed:", the middle one is labeled "Recommended Items:", and the bottom one is labeled "illustration of how and why the items were recommended".