Our project will be an internet site written in Python (server-side) and JavaScript (client-side).

The site is providing a comfortable and user-friendly environment for everyone who wants to exchange anything with other users that wants what he offers by using the "trading cycles".

Every user who register to the site will have the relevant information: which items he wants to exchange, Brief information on each item, Personal information and contact info.

The replacement process will be carried out according to an algorithm that promises that every user who participated in the process will not lose -will get item at least as good as his current item.

The algorithm we use can work successfully for various items like work shifts, personal items and more. In order to encourage users to use the site any user that participated the exchanging process will be rated by the user who received his item.

Once a user has chosen a tender and item that matches the type of item that fits the tender. He asked to rate the participants items from 1 to n such that n is the number of items in the tender. After enough participants have registered for the tender or the time of the start arrived, the algorithm will start in the following way:

Initialize a directed graph: The nodes are the people and items, there is a line which attach between the people and the item he wants the most, and from the items to their owners.

A. Find a directed circle in the graph.

B. Perform the swap in a cycle.

C. The nodes who participating in the swap are deleted from the graph.

D. Update the lines between the people and the items according to their prefers and the items who stayed in the graph.

E. Repeat steps A to D until the graph is empty.

The algorithm can work for a large number of users whenever there is a cycle in the graph which has x people and x items which each wants the other's items. Will make the swap and will continue searching for more cycles. In the "worst case" for a participant, he will stay with his current item.

At the end of the algorithm, each participant will know if which product he received from the auction

The "trading cycle's algorithm" maintains the following features:

1. The algorithm stops.
2. Truthful - It is better for each participant to tell the truth in order to have a better chance of getting the product he wants.
3. Individual rational - user who participated in the process will not lose because he can rate his item.
4. Pareto efficiency (only that strong preference relations).

Use Case

important notes:

Each sub-section indicates a different case in which the modes of operation are similar to the main section and therefore not recorded.

At the end of the algorithm each participant is allowed to see the results of the tender and to contact with the user with whom we will exchange the item and our details will be published to whoever receives our item.

If a person enters with a private link he does not have to connect to the system but if he enters with a public link on the social networks or by browsing in the site he must log in to participate in the tender.

When the item rating time is reached, users are asked to complete their rating until a certain time and if there are users who have not rated the products they are leaving the tender and thus the rating of the other participants is updated accordingly.

1. A manager wants to allow his employees to change work shifts

 •Log in / register through one of the available options.

 •Open a new "private tender" Select the number of participants and the time when the tender will start

 •You will add all the shifts of employees who participate in the tender.

 •If you are a manager attending shifts as an employee, select the shift you want to replace.

 •Send the link and password to the company's employees to join.

 •Now every employee who enters the link (can participate even if not logged in) is asked to select his item (work shift) from the list or add his work shift himself.

 •Once everyone has finished ranking the items or it is time to start the tender is arrived- the exchanging process will start.

 •At the end of the process the manager sees the shifts that each employee received.

1.2: Employees open a link to exchange shifts between employees.

1.3: Exchanging study hours between lecturers.

1.4: Exchanging classrooms / exam rooms between lecturers.

2. Exchange of apartments between families for vacation.

• Connect to the site through one of the available options.

• Open a new tender with appropriate name.

• Enter with your city as an item.

• Post the link to the tender on social networks.

• Every person who enters the link is asked to log in - if he is not registered, he will need to register and then choose his or her city as an item.

• After everyone has signed up for the tender or it is time to start the tender is arrived, an alert is sent asking participants to rate their preferences for all apartments listed in the tender depending on the location of the cities.

• Once everyone has finished to rank the apartments or the time has come, the algorithm will starts.

• The algorithm ends all the participants can see the results of the tender. And then to contact and adjust dates to make the replacement.

3. A person wants to replace an item that is no longer in use with another item of greater value for him

• Connect to the site through one of the available options.

• Look for the item you wish to receive in one of the existing open tenders.

• If there is such a tender choose it, select the item you want to exchange. And while the ranking starts, re-enter and rank all items in the tender from 1 to N.

• If no such tender, open a new tender on the site, set a number of participants and start time. Choose the product you want to replace, share the link on social networks. When the time to ranking is coming, start ranking the items from 1 to N.

• After the participants have finished ranking the products or it is time to start, the algorithm will start working.

•At the end of the algorithm each participant will be able to see the results of the tender.

3.1: Exchanging clothes.

3.2: Exchanging event seating places / tickets for events.

3.3: Exchanging vouchers.

3.4: Exchanging a final project between students.

4. A visitor who is not connected to the site can see:

• Option to register as a new user or login.

• The open tenders for registration but cannot join (unless received link and password from a closed group).

• Completed tenders and the results of tenders.

5. Admin

The admin of the website will be able to delete users / send warnings to users who did not behave properly for example: suggested a non-existent item / item in a bad condition / Miss out important details that make it difficult to use the suggested item.

Permissions:

Participant manager– can delete users from tender before algorithm starts, change the tender name, decide the number of participants and the time that the tender will start, share link and participating in the exchanging process.

Participants in a tender- share link, participating in the exchanging process

Milestones:

Creating a full detailed plan with the main goals of the project and coordinating expectations.

Creating a site in Python using client-side JavaScript.

Create users and connect to database.

Creates a Python code that follows the trading cycle's algorithm and matches the item swap expectations.

Integrate the algorithm on the site using the information of the participants and their items.

Interfacing with social networks, Mobile Phones.

Improving user experience on the site.

Summery:

Our site is for everyone who wants to try to gain better items by swap with other people.

The multiTrade is a community sales site that encourage the users to participate by giving the promise they will not lose.

Unlike other web sites of trading that transfer items one by one - in our site the exchanging will be in big groups so that you can choose the favorite item from various options even if you want item from person who not want what you have.