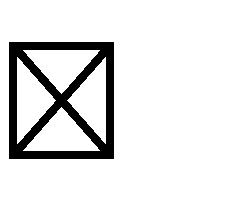
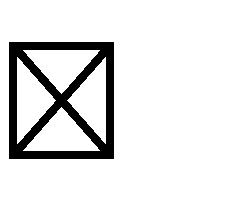
You are tasked with designing and implementing an e-commerce platform that includes a robust recommendation system. The goal is to suggest products to users based on their browsing and purchase history, thereby enhancing the user experience and promoting relevant products. The system needs to efficiently handle large amounts of data and provide personalized recommendations.

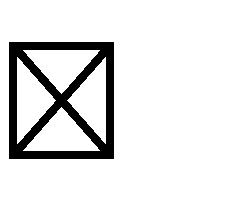
EXPLANATION :

 Adding Users and Products:

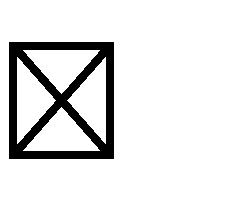
* Users and products are stored in hash tables using their unique IDs, which allows for quick access and modification. Each user and product is added to the linked list at the corresponding table index to handle hash collisions.

 Tracking Browsing and Purchase History:

* Browsing and purchases are recorded in the Graph structure using an adjacency matrix. When a user browses or purchases a product, the corresponding cell in the matrix is updated. Browsing is denoted by 1 and purchases by 2. The weights matrix increments to reflect the user's engagement with a product, contributing to the recommendation score.

 Graph for Recommendations:

* The Graph structure holds both the adjacency matrix (for relationships) and the weights matrix (for recommendation scoring).
* The recommendation score is simply the value in the weights matrix. If the score is greater than zero, the product is recommended.

 Recommendation Algorithm:

* The program generates recommendations by iterating over all products. It suggests products that have not been interacted with (value 0 in the adjacency matrix) but have a positive recommendation score (calculated from the weights matrix).

OUTPUT :-



