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# Online System Chosen for Reflection:

Online Shopping Platform (e.g., Amazon)

# Introduction:

One of the most prevalent online systems in today's digital age is an online shopping platform. Platforms like Amazon, eBay, and Alibaba have revolutionized the way we shop. At their core, these systems are reliant on a complex interplay of data structures to function seamlessly.

# How Data Structures might operate at the back end of an Online Shopping Platform:

## Stacks:

When I add items to my shopping cart, it can be visualized as a "stack", with the most recent item being on top. Every time I add a new item, it's pushed onto the stack. When I remove an item from the cart, it's popped from the top. Dicheva & Hodge's game-based approach to teaching the stack data structure can offer an engaging way for budding developers to understand and visualize this process [1].

## Queues:

In the logistics and shipping aspect of an online shopping platform, orders are processed in the order they are received, a classic use of the Queue data structure. Items wait in the "queue" until they are dispatched for delivery.

## Trees:

Categories and sub-categories in the online platform can be visualized as a tree structure. For instance, under the main category 'Electronics', there might be sub-categories like 'Mobiles', 'Laptops', and so on. Searching for products within categories can be optimized using tree traversal algorithms.

## Graphs:

Recommendations based on viewing history or related products can be implemented using graph structures. Nodes represent products, and edges can represent their relationships based on user behaviour or product similarities.

# Reflection on the Educational Game Approach:

Introducing data structures through game-based learning, as proposed by Dicheva & Hodge, provides a hands-on approach to understanding these concepts. It's an active learning experience compared to traditional theoretical methods [1].

By integrating a meaningful storyline with practical implementations and conceptualizations of data structures, the game facilitates a comprehensive learning experience. The use of a robot in the game to traverse challenges related to stacks can mirror the path a product takes from being added to the cart to its final delivery in our online shopping example.

# Challenges and Advancements in Learning Data Structures:

The paper highlights that traditional methods might not align well with the changing educational landscape [1]. With the increasing integration of technology in every sphere of life, including our online shopping platform, it becomes crucial for students to have a profound understanding of these foundational concepts. The game-centric approach provides an interactive and engaging environment for grasping these complex topics.

# Conclusion:

Understanding the nuances of data structures is essential for the seamless operation of online systems like shopping platforms. As these systems get more complex, there's a growing need for effective learning tools that can simplify these concepts for budding developers. The game proposed by Dicheva & Hodge is a step in this direction, making learning data structures engaging and practical [1].

# References:

* Dicheva, D., & Hodge, A. (2018). Active Learning through Game Play in a Data Structures Course. In Proceedings of SIGCSE’18, Baltimore, MD, USA.