Answer1: I used three new features. I. Income to TRB (how well a customer manages their money based on their income and account balance), II. Age to Income (helps spot patterns in how people handle money based on their age and income) and III. TRB squared (help highlight customers with very high account balances so we can better spot outliers). Without any features the silhouette score was just 0.77. Then I introduced features, and score improved to 0.93 which means clusters were now better compacted and tighter. Features helped the model better understand financial behavior resulting in better score.

Answer2: Suppose two groups: Younger but lower savings, and Older with higher savings. When these two types are separated then it helps institutions like HSBC to market relevant products and services to each group. This is called segmentation, and this can lead to various benefits like customer satisfaction, loyalty, etc.

Answer3: Top-down approach has pre-defined categories based on demographics that are of common use hence are very vague and do not fit for specific or complex data like that of HSBC. Bottom-up identifies and segments data based on what patterns the model could comprehend from the data itself without assuming anything pre-hand.

Answer4: I would use the same customer segmentation techniques to better understand my clients. By looking at key financial data like income, account balances, and transaction patterns and using feature engineering with clustering, I could identify customers who need attention and show strong potential for growth. HSBC has shown how AI can be used to group customers and offer personalized services. I would follow a similar path. First growing its mass-market products, then moving toward specialized solutions to improve financial inclusion while managing risks more effectively.