1. Are all 10 questions important to create the sorting hat? Which questions would you remove and justify your answer?

Some questions, such as "What is your preferred pet?" and "What is your dream career?", could be less relevant in determining house traits and might be removed. Questions related to personal values, responses to challenges, and personality would be more valuable for house sorting.

2. How could you improve the model's accuracy or efficiency?

To improve accuracy, we could collect a larger, more diverse dataset, ensuring that it captures a wider range of personalities. Implementing cross-validation would help avoid overfitting. For efficiency, reducing the tree depth or using an ensemble method like Random Forest could balance both accuracy and speed, especially with larger datasets.

3. What additional sensors or hardware could enhance the user experience?

Adding voice recognition could make the process more intuitive, allowing users to verbally answer questions. A gesture sensor could also improve interactivity by letting users respond without pressing buttons. Additionally, a heart rate sensor or emotion detection could personalize the experience based on user reactions.

4. Does decision tree remain suitable for your choice of new sensors? If yes, carefully justify your answer. If not, what ML model would you use and explain why?

Decision trees are suitable for structured, categorical input, but with additional sensor data like voice or gesture recognition, more advanced models like Random Forest or Support Vector Machines (SVM) could handle the increased complexity and improve model performance by managing the diverse data types.