This is a binary dataset containing 5 attributes and 14 objects (row). Each object is unique in the data set.

Answer following questions by referring “Mining Approximate Descriptions of Sets Using Rough Sets” by Dan A. Simovici, Selim Mimaroglu.

**Question 1.**
How many partitions can be created on this data set by using set of attributes as equivalence classes? For the subset of attributes \{B,C,E\}, show the partition and members of each block in the partition.

**Question 2.**
Let \( T \) be the data set (as defined above), with attributes \( H = ABCDE \). Our search space is the set of subsets of \( H \). Suppose that we seek to identify a description of the set \( \{ \text{Row 2, Row 4, Row 6, Row } \)
8]. Do the following:

A) For equivalence class on the set of attributes \{B, C, D\} show the negative and positive borders on the description set.

B) For the equivalence class on the set of attributes \{C, E\} show the negative and positive borders on the description set.

**Question 3.**

Implement only computation of borders, shown in Figure 2, in the most possible efficient way using Java and BitSets. For this part of the final you are required to make a **DEMO**.

```
Input: T: data set, \( \mathcal{D} \): set of objects, \( K \): set of attributes
Output: Positive (\( Pos \)) and Negative Border (\( Neg \)) of \( \mathcal{D} \)
1  \( Pos := \{ \} \);
2  \( Neg := \{ \} \);
3  \( \mathcal{D}^c := \mathcal{O}_{\mathcal{T}} - \mathcal{D} \);
4  foreach \( t \in \mathcal{D} \) do
5    foreach \( t' \in \mathcal{D}^c \) do
6      // project on \( K \)
7      if \( t[K] \ == \ t'[K] \) then
8         add \( t \) to \( Pos \);
9         add \( t' \) to \( Neg \);
10  output \( Pos \cup Neg \);

Figure 2. Computation of Border, 
FindBorder(\( T, \mathcal{D}, K \))
```