Find an optimum solution to the following transportation problem.

Initial feasible solution (by North-West Corner Rule)

\[
\begin{array}{ccc}
1 & 2 & 3 \\
1 & 7 & 4 & 2 \\
2 & 13 & 4 & 5 \\
3 & 2 & 8 \\
\end{array}
\]

Cost = 21 + 8 + 2 + 35 = 66.

Now, \( IV(2,1) = -5 + 3 - 7 + 2 = -7 \) \( \checkmark \)

\( IV(2,2) = -5 + 4 - 4 + 2 = -3 \)

\[
\begin{array}{ccc}
1 & 2 & 3 \\
1 & 7 & 4 & 2 \\
2 & 13 & 4 & 5 \\
3 & 2 & 8 \\
\end{array}
\]

Cost = 66 - 21 = 45

Now, \( IV(1,1) = -2 + 7 - 3 + 5 = 7 \)

\( IV(2,2) = -5 + 4 - 4 + 2 = -3 \) \( \checkmark \)

So we move \( \min (2,4) = 2 \) breads to cell (2,2) and reduce the cost by 6.

\[
\begin{array}{ccc}
1 & 2 & 3 \\
1 & 7 & 4 & 2 \\
2 & 13 & 4 & 5 \\
3 & 2 & 8 \\
\end{array}
\]

\( \rightarrow \) Cost = 45 - 6 = 39

Now \( IV(1,1) = -2 + 7 - 3 + 2 = 4 \geq 0 \) so 39 is the optimal cost.