**Q3:**

This report analyzes the optimization of film production within the entertainment industry, with the aim of optimizing profitability by identifying the most suitable production quantities for various films, taking into consideration various constraints and variables. The first step in the analysis is to look at the objective cell, where the total profit is calculated. The initial value and the final value of the total profit are both calculated at 33.2 units, demonstrating that the optimization model was able to sustain the initial profit value over time.

The subsequent section of the report concentrates on the variables, which are the quantities of various films to be manufactured. Every variable cell has its original value and its final value, which indicates the amount of the film to be manufactured. The values of the variables have been optimized in accordance with the constraints and objectives specified. For instance, the amount produced of film "X2" is set to one, while film "X1", "X3," "X7", "X8", "X9", "X10", "Y1", "Y2", "Y4", "Y5", "Y6", "Y7", "Y8", "Y9", and "Y10" are set to zero. Similarly, the amounts of films "X4", "X5," "X6", and "Y3" are set to one, indicating that they have been identified as the optimum choices for production.

We now move on to the constraints. Each constraint cell represents a condition or requirement that needs to be met. The cell value represents the outcome of the constraint evaluation. The formula represents the relationship of the constraint to other variables. In the report, the constraints are classified as either "binding" or "non-binding" based on their influence on the optimization outcomes. For instance, the constraint associated with ">=1 drama Total" is non-binding because the final value of "3" exceeds the required minimum value of "1" by a significant amount.

When examining the variable cells, the focus is on their final values, associated costs, associated coefficients, and range values. The final value indicates the optimal amount of the variable produced, while the associated cost indicates the cost associated with the variable or its effect on the objective function, and the associated coefficient indicates how sensitive the objective function is to changes in the associated variable. The permissible increase and decrease values indicate the range within which a variable can be modulated without exceeding the limits.

The next step in the report is to look at the constraint cells by their final value, shadow price, constraint equation, and allowable range. The final value indicates the result of the constraint assessment. The shadow price shows the change rate of the objective function in relation to a change in the unit constraint value. The constraint equation shows the relationship of the constraint with the other variables. The allowable increase/decrease values show the range in which you can adjust the constraint without impacting the optimization result.