BONUS TASK

Profit formula = ticket price*attendance + spend per person(merch/drinks)*attendance -5000 – 8*attendance

**Assumptions:**

Assumed that crowd size is linearly dependent with ticket price. Used numpy.polyfit to find the equation of the line.

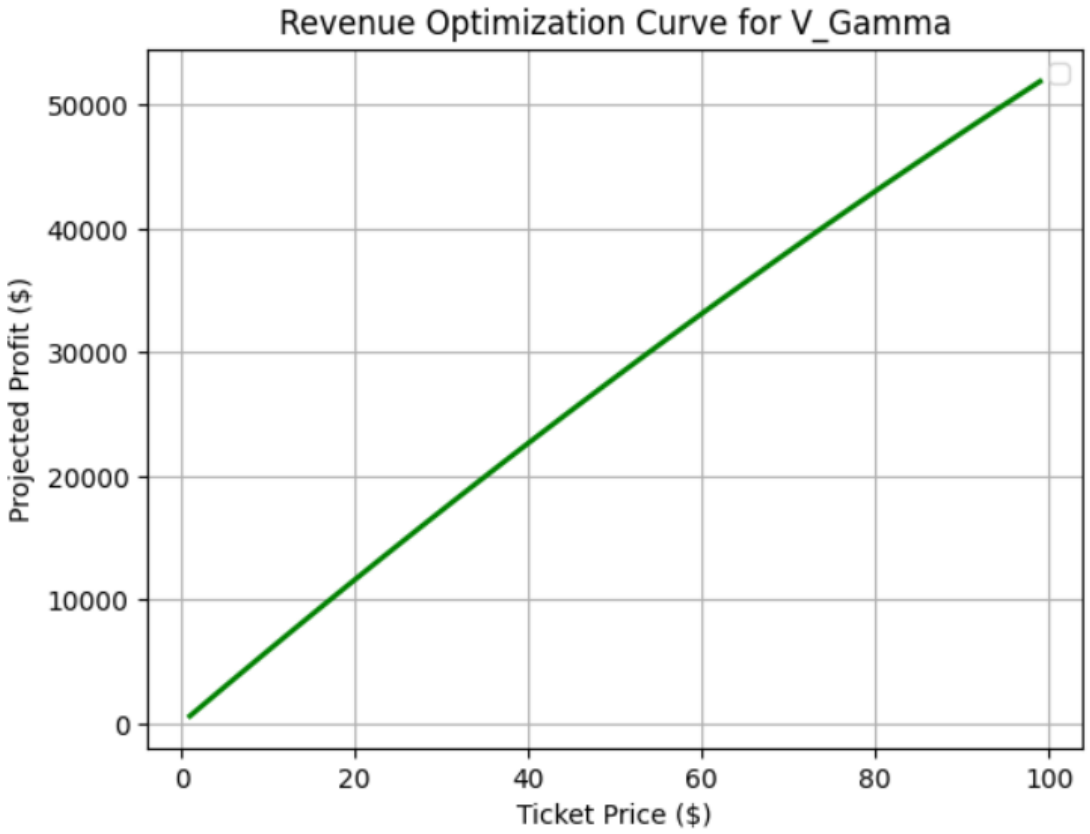
Assumed that the people spend increases with increasing crowd energy and decreases with decreasing crowd energy with a value of 25 at 80 crowd energy level and even at minimum crowd energy levels people will spend a minimum 5 dollars.

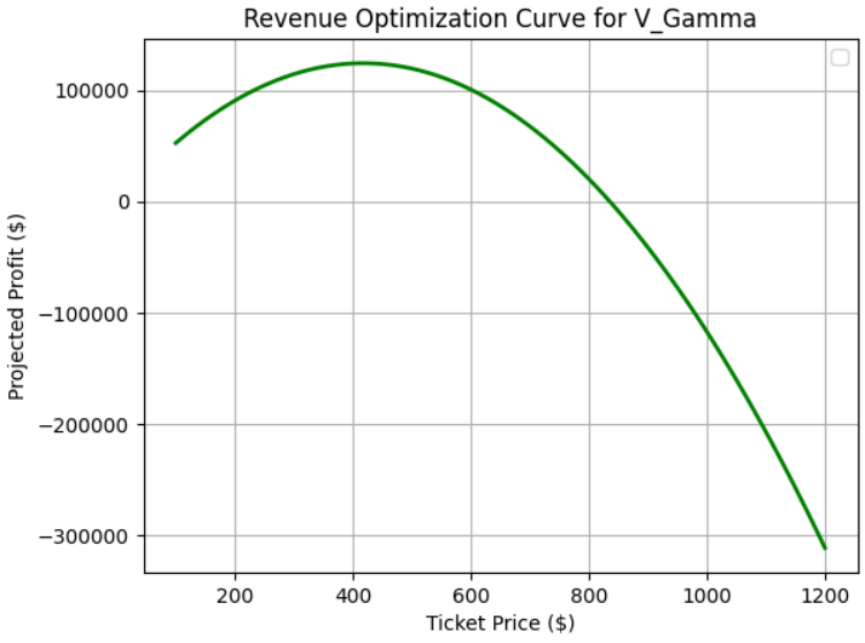
**Optimization**

Construct a dataframe with all other columns fixed changing the ticket price from 1-100 and derive the crowd size from the formula relating it with ticket price. Calculate the crowd energy from the previously trained ML model and using the predicted crowd energy find the spend per person.

Calculate the profit using the above formula and plot a graph to see the maximum profit at which corresponding ticket price.

The curve was increasing for the entire 1-100 range but the optimum price was 417 which was out of the range.




In [60]:
```
opt_index = test_df['profit'].idxmax()
opt_scenario = test_df.loc[opt_index]
opt_price = opt_scenario['Ticket_Price']
max_profit = opt_scenario['profit']
print(f"optimal price {opt_price}")
```

```
optimal price 417
```