KEY FINDINGS FOR EACH VENUE

1. The Holy Grounds (V_Alpha):

- This venue is a music freak, having almost all shows to be moderate to highly energetic ones.
- People here are not price sensitive and were energetic on all ticket price ranges.

2. The Vampire’s Den (V_Beta):

- This venue could be the energy sink of venue as this was the place were most the least energetic shows were performed.

3. The Snob Pit (V_Gamma):

- This was a price sensitive venue where higher prices usually resulted in higher Crowd_energy.
- From graph it’s clear that ticket prices has a lower limit. Also the band tried for some free concerts here but the energy was still unpredictable.

4. The Mosh Pit (V_Delta):

- This venue has hosted the maximum number of shows which indicates it is a favourite place for the band to perform.
- A clear distincting feature of this venue is the strong monotone dependence of Crowd_energy on Volume levels.

SINGER'S THEORIES

- **THE TUESDAY CURSE**

  The mean crowd energy for Tuesday is not that less, even it is higher than Wednesday and Thursday.
  Though it's less than that of weekend days, but this certainly denies the singer's hypothesis regarding tuesday shows.

- **FULL MOON = MAGIC**

  The Mean Crowd Energy v/s Moon Phase chart shows mean_energy on full moon shows were not energy-loaded instead they were in middle range in the groupings of moon phases. So clearly this observation is also not correct. Also it is evident that the both Waxing phases were one of highest energy show nights.

- **RAIN SUCKS**

  From the Mean Crowd Energy v/s Weather chart, Rainy shows have the highest mean_energy as compared to any other weather. So this discards the singer's hypothesis regarding rain.

- **THE SWEET SPOT**

From Ticket Price v/s Crowd Energy graph it's clear that crowd energy tends to increase with increase in ticket price. The free tickets also do not ensure that energy will be high.
The proportion of low energy shows also decrease with increase in ticket price, with most of low-energy shows in the medium price range.
The points in medium price range are concentrated near the average_energy point whereas those for high priced shows are spread out but still above the average.
So the sweet spot for price would be venue dependant and probably lie in the $70 - $100 range.

- **CROWD FEEDS ITSELF**
  From level v/s Crowd energy graph, there is no venue where we can conclude that the crowd itself feeds energy as no venue shows clear uptrend in crowd energy with increase in crowd_size.

- **POST SHOW SALES**
  From Merch Sales Post Show v/s Crowd Energy graph, it can be easily inferred that more crowd energy leads to more merch sales post show.

JUSTIFICATION FOR CHOICE OF MODEL

I have applied the Random Forest Regression model for this purpose because it handles non-linear relations well and also handles one-hot encoding properly. It is simple to train and can be generalised easily for other test data. Moreover, they are robust to noise and outliers which in this case is helpful. This was preferred over Decision Tree Regression model as latter is sensitive to noise and overfits the training data.