BTC-USD Forecast Report (ARIMA, SARIMA, Prophet)

# 1. Forecast Summary Statistics (Next 30 Days)

ARIMA SARIMA Prophet  
count 30.00 30.00 30.00  
mean 92043.29 92998.42 80010.03  
std 338.96 224.32 3181.00  
min 91532.23 92605.61 76608.48  
25% 91706.57 92826.52 77228.18  
50% 92029.91 93001.77 78765.02  
75% 92349.78 93177.05 82437.02  
max 92579.82 93399.27 86217.69

# 2. Model Interpretations

🔹 ARIMA: Models short-term dependencies and trends. Forecast is smooth and conservative (~$92k average).

🔹 SARIMA: Adds seasonality to ARIMA. Slightly higher forecast (~$93k) due to weekly seasonality.

🔹 Prophet (Improved): Captures recent trends with wider variation. Forecast ranges from ~$76k to ~$86k with more volatility.

# 3. Key Observations

• Prophet’s forecast was earlier underestimating prices. After tuning with changepoint\_prior\_scale=0.5 and multiplicative seasonality, it now responds better to recent price increases.

• Prophet shows the most volatility (std dev: ±3181), which is expected for highly volatile assets like Bitcoin.

• ARIMA and SARIMA remain smoother and more stable, but may miss sudden surges or drops.

# 4. Forecast Plot

