**Opening**

Hello! My name is Vladyslav Misonh, and today I’m excited to present my capstone project: **“U.S. Housing Market Trends and Forecasting”**, which I completed as part of my Data Analytics program.

The centerpiece of my project is an **interactive dashboard built in Power BI**. It’s designed to explore historical trends in home prices, analyze economic and policy-driven factors influencing these changes, and build predictive models for future home values. With this dashboard, users can filter by metro area, examine key metrics like income, unemployment, and taxes, and understand how these factors shape local real estate markets.

To walk you through this story in a clear and engaging way, I’ve also prepared a presentation that highlights major insights and supports my findings visually. Let’s take a look together.

**Slide-by-Slide Overview**

1. **Start**
2. **US Housing Market Overview**  
   My key goals for this project was
   1. Track Housing Price Changes Over Time
   2. Identify key factors driving home prices
   3. Forecast Future Home Values
3. **Why This Project?**  
    Understanding real estate trends is more important than ever in our reality, as rising home prices, economic uncertainty, and post-pandemic shifts reshape the U.S. housing landscape. And I, as a pretty new person in the US, was looking to discover it for myself and all of you.

1. **Questions to Explore** Before diving into the data, let's talk about the questions I'll try to answer.
   1. How have home prices changed in major U.S. metro areas from 2018 to 2023?
   2. Which metro areas experienced the fastest growth in home values?
   3. What external factors—such as unemployment, income levels, and tax rates—are most strongly associated with price shifts?
   4. 4. Can we build reliable 3-year forecasts for home values across key metro areas?
2. **Data Sources**
3. **Dataset Overview**  
    The dataset covers 50 U.S. metro areas + national average. The dataset spans with monthly data from January 2018 to December 2026, including 5-years of historical data and machine-learning-based 3-year forecasts.
4. **Trends Overview (Transition)**  
    Understanding the trajectory of U.S. home values is crucial for homeowners, investors, and policymakers alike.
5. **U.S. ZHVI Over Time**  
    This chart highlights the growth in the Zillow Home Value Index (ZHVI) across the United States from January 2018 through December 2023.

Key observations include:

* A sharp COVID-era price spike in 2020–2021 driven by low interest rates, remote work migration, and supply constraints
* A moderation in 2022 due to rising interest rates and inflation
* A stabilization trend in 2023 as the market began to normalize

These national patterns set the foundation for deeper metro-level analysis in the following slides.

1. **Monthly Home Sales & Inventory Trends**  
    This dual-line chart shows national trends in single-family home sales and available inventory from 2018 through 2023.

Key takeaways:

* Inventory fell sharply during 2020–2021, as high demand outpaced supply — contributing to rapid price appreciation.
* Sales volumes peaked in 2021, coinciding with historically low interest rates.

Tracking the balance between supply and demand is essential to understanding local market pressures, and we explore these dynamics at the metro level next.

1. **Top 5 Fastest-Growing Metros (2018–2023)**  
    This bar chart highlights the five metro areas with the highest percentage increase in the Zillow Home Value Index (ZHVI) between January 2018 and December 2023.

Key observations:

* Each of these metros saw over 60% growth in home values, indicating robust local housing demand.
* Markets like Boise, Phoenix, and Charlotte benefited from population inflows, remote work migration, and comparative affordability during the post-2020 housing boom.

Tracking these growth leaders provides insight into both investment opportunities and future affordability pressures in high-growth metros.

1. **Drivers of Home Value (Transition)**  
    This section explores the underlying factors that influence home price trends across different metro areas.
2. **Market Drivers of ZHVI** This heatmap visualizes the correlation coefficients between Zillow Home Value Index (ZHVI) and various metro-level drivers from 2018 to 2023.

Key insights:

* Median Income shows a strong positive correlation with ZHVI, suggesting that higher earning regions tend to have higher home values.
* Unemployment Rate and Natural Disasters display a negative relationship with ZHVI, indicating potential downward pressure on housing values in affected areas.
* Tax Variables (e.g., Income Tax, Sales Tax) show mixed correlations, reflecting regional policy impacts that may either incentivize or deter housing demand.

These correlations provide a foundational understanding of which factors most influence home value changes across U.S. metros.

1. **ZHVI vs Median Income & Tax**  
    This visual compares how median household income and income tax rates relate to Zillow Home Value Index (ZHVI) across U.S. metro areas from 2018 to 2023.

Key insights:

* Higher median incomes are strongly associated with higher home values, reflecting greater purchasing power and demand in more affluent regions.
* Higher income tax rates also tend to align with elevated ZHVI, possibly due to urbanized states where both taxes and housing costs are above average.
* Notably, some low-tax metros still exhibit high home values, driven by factors like inbound migration, housing supply constraints, or regional desirability.

This dual-variable view highlights how economic strength and policy environments jointly shape regional housing outcomes—providing a lens into affordability tradeoffs, market pressures, and investment opportunities across the U.S.

1. **Regional Comparison (Transition)**  
    As home values shift in response to local conditions, regional comparisons become essential to understanding the broader housing landscape.
2. **Regional Housing Market Summary**  
    This matrix provides a side-by-side comparison of key housing and economic metrics across U.S. metro areas (2018–2023): A helpful snapshot of diversity across U.S. housing markets.
3. **ZHVI by Region**  
    This map visualizes regional differences in the Zillow Home Value Index (ZHVI) across U.S. metro areas as of December 2023.

Key Insights:

* West Coast and Northeast metros generally report the highest home values, driven by economic hubs, limited housing supply, and sustained demand.
* Southeastern regions show moderate but growing values, reflecting migration patterns and affordability-driven relocation.
* Midwestern metros tend to maintain more affordable housing, though some areas experienced notable appreciation during the pandemic era.

This spatial view highlights how geography influences housing markets—helping uncover where price pressure and affordability vary most sharply across the country.

1. **Taxes & Impact (Transition)** In this section, we explore how state and local tax policies shape housing markets across U.S. metro areas.  
    From income taxes that affect household budgets to sales taxes that influence cost of living, taxes play a crucial role in regional affordability and home value trends.
2. **Taxes vs. Home Prices**  
    This dual-axis visual compares average metro-level income tax and sales tax rates with average ZHVI (Zillow Home Value Index) from 2018 to 2023.

Key insights:

* Income Tax appears to have a stronger relationship with home values compared to Sales Tax. Metros with higher income taxes often show elevated home prices, potentially due to urbanization, high demand, and premium housing markets.
* Sales Tax demonstrates a weaker or inconsistent pattern, suggesting its impact on home values is less direct or mediated by other regional factors.
* Some low-tax metros still exhibit high ZHVI, indicating that housing demand, migration, and supply constraints may outweigh tax effects in certain regions.

These charts suggest that income tax policy may play a more substantial role in shaping long-term housing affordability and regional value differentials.

1. **Forecasting (Transition)** As we look to the future, housing market forecasts offer valuable insights for planning, investment, and policymaking.
2. **Forecasting Methodology**  
    For forecasting values I used a two-step model: at first forecast economic drivers, then predict future Zillow Home Value Index ZHVI.
3. **Forecast Results** This chart displays the projected Zillow Home Value Index (ZHVI) for the **United States** from 2018 through 2026.

The **vertical red dashed line** marks the transition point from historical data (2018–2023) to machine learning-based forecasts (2024–2026). We observe a consistent upward trend in home values after 2023, with moderate seasonal fluctuations.

#### Key Takeaways:

* Post-2023 acceleration: National home values show a noticeable rise after 2023, indicating renewed market momentum.
* Forecasted growth: By the end of 2026, national ZHVI is projected to exceed $400K, driven by income growth and constrained inventory.

These trends suggest continued strength in the national housing market, with policy, affordability, and employment conditions likely to shape future stability.

1. **Forecasted Outcomes for 2026**  
    On this slide, we take a closer look at the key forecasted outcomes by the end of 2026, based on machine learning projections.
   1. First, we see that the average home value is expected to reach around $451,300. This value reflects the ongoing demand in housing markets and anticipated appreciation in property values across U.S. metro areas.
   2. Next, we have the percentage change in home value, showing an 85.68% increase from 2018 to 2026. That’s a substantial growth rate over 8 years, signaling strong market momentum and significant equity gains for homeowners in many regions.
   3. Moving on to income, the forecasted median household income is projected to be about $72,600.
   4. Finally, we have the unemployment rate forecasted at 7.77% by the end of 2026.

Together, these indicators help paint a picture of a housing market that is growing, but with some risks — especially in affordability and employment — that may affect access and stability for certain populations.

1. **Key Takeaways & Insights**
   * Drivers like income, unemployment, and taxes are more predictive than geography alone.
   * Economic pressure (e.g., tax burden, job loss) dampens price growth.
   * Recovery is uneven but ongoing across metros.
2. **Thank You**  
    Thank you for attention, if you want to discover more about this project you can scan this qr-code is a link to my linkedin profile where you can find all useful links and reach me out