**Data Exploration & Cleaning (Task\_1.ipynb)**

I am using the **pandas** library from Python for data exploration and cleaning.

At first, I checked for missing values, duplicates, or any type inconsistency using the isnull() function from pandas. There were no duplicates, inconsistencies, or necessary missing values.

If duplicate values had been found, we could use drop\_duplicates() to remove them. For missing values, interpolate() can be used to fill gaps using a linear method based on surrounding data points.

**Dataset Summary:**

<class 'pandas.core.frame.DataFrame'>

RangeIndex: 20000 entries, 0 to 19999

Data columns (total 14 columns):

# Column Non-Null Count Dtype

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0 user\_id 20000 non-null int64

1 install\_date 20000 non-null object

2 last\_active\_date 20000 non-null object

3 subscription\_type 20000 non-null object

4 country 20000 non-null object

5 total\_sessions 20000 non-null int64

6 page\_views 20000 non-null int64

7 download\_clicks 20000 non-null int64

8 activation\_status 20000 non-null int64

9 days\_active 20000 non-null int64

10 pro\_upgrade\_date 20000 non-null object

11 plan\_type 20000 non-null object

12 monthly\_revenue 20000 non-null int64

13 churned 20000 non-null int64

dtypes: int64(8), object(6)

memory usage: 2.1+ MB

**Distribution of Free vs. Pro Users:**

subscription\_type

Free 79.86%

Pro 20.14%

**User Engagement Analysis (Task\_2.ipynb)**

**Average Number of Sessions for Free vs. Pro Users:**

subscription\_type

Free 76.08

Pro 154.68

**Top 5 Most Active Users (Based on Total Sessions):**

user\_id total\_sessions subscription\_type

189 300 Pro

822 300 Pro

1572 300 Pro

2457 300 Pro

3349 300 Pro

**Top 5 Countries with Highest Engagement:**

country total\_sessions

India 272,202

Germany 266,319

Canada 264,217

USA 261,635

France 259,495

**Churn Analysis (Task\_3.ipynb)**

**Overall Churn Rate for Free vs. Pro Users:**

subscription\_type

Free 28.60%

Pro 28.25%

**Correlation of Features with Churn:**

churned 1.000000

user\_id 0.012038

download\_clicks 0.000974

total\_sessions -0.000273

page\_views -0.005605

activation\_status -0.005823

monthly\_revenue -0.008328

days\_active -0.617213

**Top 3 Factors Contributing to Churn:**

['user\_id', 'download\_clicks', 'total\_sessions']

**Conversion & Revenue Analysis (Task\_4.ipynb)**

**Upgrade Statistics:**

* **Percentage of users who upgraded from Free to Pro:** 20.14%
* **Total monthly revenue from Pro users:** $235,481.00

**Average Time to Upgrade (in Days) by Country:**

UK 87.90

USA 90.24

France 91.16

Germany 91.53

India 92.58

Canada 93.57

Australia 93.68

**Churn Reduction & Market Expansion (Task\_5.ipynb)**

**Three Strategies to Reduce Churn:**

1. **Low Engagement Users** – Re-engagement campaigns (e.g., emails, notifications).
2. **Medium Engagement Users** – Targeted upsells to push upgrades.
3. **High Engagement Users** – Collect feedback on pricing and feature gaps.

**Ways to Increase Free-to-Pro Conversions:**

* Target free users who show pro-like behavior.
* Highlight Pro feature value through testimonials and trials.
* Simplify the upgrade process.

**Potential Market Expansion:**

**Top 5 High-Engagement Countries:**

India, Germany, Canada, USA, France

**Top 5 Underpenetrated Markets:**

Australia, UK, France, USA, Canada

**Actions:**

* Localized marketing for high-engagement regions.
* Address barriers in underpenetrated markets with research and regional pricing.

**A/B Testing & Growth Experiments (Task\_6.ipynb)**

**Impact of Increasing Landing Page Conversion by 10%:**

* **Current Conversion Rate:** 40.29%
* **New Conversion Rate:** 44.32%
* **Estimated Additional Pro Upgrades:** 403

**A/B Testing Ideas to Improve Conversions:**

1. **Call-to-Action (CTA) Button Design & Placement**
2. **Simplified vs. Detailed Pricing Page**
3. **Social Proof & Testimonials Placement**

**Key Performance Indicators (KPIs):**

* **Churn Rate:** 28.52%
* **Conversion Rate (Free to Pro):** 25.23%
* **Customer Lifetime Value (CLV):** $701.36

**Growth Strategy & KPI Tracking (Task\_7.ipynb)**

**Key Performance Indicators (KPIs) to Track:**

* **Churn Rate:** 28.52%
* **Conversion Rate (Free to Pro):** 25.23%
* **Customer Lifetime Value (CLV):** $701.36

**Actionable Growth Strategies:**

1. **Improving Onboarding & Activation**
   * Simplify activation with tooltips and guides.
   * Behavioral triggers (pop-ups, emails) to drive activation.
   * Incentives for activated users (discounts, trials).
2. **Targeted Upselling Campaigns**
   * Email campaigns for users who clicked "Upgrade to Pro."
   * Exit-intent pop-ups to capture potential conversions.
   * A/B test campaigns for better conversion optimization.

**Measuring Success:**

* Compare activation rates and churn rates before and after strategies.
* Conduct A/B testing to evaluate different onboarding approaches.
* Track revenue and click-through rates (CTR) over time.

This structured document summarizes the key insights from the analyses performed in the notebooks while maintaining clarity and professionalism for easy presentation in MS Word.