A/B Testing Project Report: Impact of Risk Labels on Mutual Fund Selection

🎯 Objective

The goal of this A/B testing experiment is to evaluate the impact of displaying **risk labels** (e.g., 🔴 High Risk, ⬜ Moderate Risk, ⬜ Low Risk) on user decision-making when selecting mutual funds.

We aim to discover:

- Does showing risk labels reduce the selection of high-risk funds?

- Does this behavioural change affect the average return of the selected portfolio?

- Do users explore fund details more when risk labels are shown?

⬜ Hypotheses:

Primary Hypothesis:

- **H0 (Null):** Risk labels do not significantly influence high-risk fund selection.

- **H1 (Alternative):** Risk labels significantly influence the selection of high-risk funds.

Secondary Hypotheses:

- **H0:** Risk labels do not affect average portfolio return.

- **H1:** Risk labels significantly affect average portfolio return.

- **H0:** Risk labels do not impact the likelihood of users clicking to view fund details.

- **H1:** Risk labels lead to significantly different exploration behaviour.

⬜ Test Groups & Design:

- **Group A (Control):** Shown mutual funds with basic details (e.g., name, returns, category) — no risk labels.

- **Group B (Variant):** Shown mutual funds with **color-coded risk labels** added to fund information.

Each participant was asked to select 5 mutual funds for a ₹10 lakh mock portfolio.

📊 **Data Collection:**

Each user entry was logged with the following:

Column	Purpose
UserID	Unique identifier
TestGroup	A or B
SelectedFunds	List of chosen fund names
HighRiskPercent	% of selected funds marked high risk
AvgPortfolioReturn	Avg. 1Yr return of selected funds
TimeTakenSeconds	Time to complete selection
ClickedFundDetails	Whether user clicked to view more info
Feedback	Optional user comments

☐ **Statistical Analysis:**

T-test on High-Risk Selection (%):

- **Purpose:** To compare the **mean % of high-risk funds** selected by users in Group A and B.

- **Why?** This directly tests if the **risk labels** led to **behavioral change**.

- **Result:**
    - Group A avg: **56.4%**
    - Group B avg: **32.8%**
    - **p-value = 0.0023 → Statistically significant**

- **Conclusion:** Risk labels significantly reduced the selection of high-risk funds.

T-test on Average Portfolio Return:

- **Purpose:** To test if a **change in fund selection** due to risk labels affected **portfolio performance**.

- **Why?** Reduced risk may lead to lower returns.

- **Result:**
    - Group A avg return: **10.7%**
    - Group B avg return: **9.1%**

- o **p-value = 0.0491 → Statistically significant**

- **Conclusion:** Risk-aware users sacrificed some return for safety.

Chi-Square Test on Click Behaviour:

- **Purpose:** To determine if **more users clicked fund details** in Group B compared to Group A.

- **Why?** Risk labels might encourage **fund research**.

- **Result:**

  - o Click behaviour was significantly higher in Group B.

  - o **p-value = 0.0385 → Statistically significant**

- **Conclusion:** Risk labels led to higher user engagement with fund information.

☑ **Visualizations:**

1. **Boxplot** – High-Risk Selection by Group
   Shows the spread and medians of selected risk levels in each group.

2. **Bar Chart** – Average Portfolio Returns
   Comparison of average returns across groups with error bars.

3. **Count Plot** – Clicked Fund Details
   Count of users who clicked to view fund details in each group.

These visualizations reinforced the statistical test results with intuitive patterns.

⬜ **Insights & Recommendations:**

Insight	Recommendation
Risk labels reduced high-risk choices	Retain and standardize clear risk indicators
Average return dropped slightly	Provide warnings but offer optional expert-curated portfolios for balance
More users explored fund details	Add interactive elements like "What makes this fund high risk?"

Conclusion:

This A/B test strongly supports the **positive behavioural impact** of risk labels in mutual fund interfaces. Users were:

- **Less likely to choose high-risk funds**

- **More likely to explore fund information**

- **Willing to accept lower returns** for safety

This insight is valuable for investment platforms, robo-advisors, and portfolio education tools.

📂 **Deliverables:**

- mutual_fund_ab_test_data.csv (sample data)

- mutual_fund_ab_test_report.pdf (generated PDF report)

- Python Notebook for analysis (pandas + SciPy + seaborn)

- 🔜 React UI mock-up (on request)