2.) **Identifying Potential Bias in the Telco Customer Churn Dataset**

| **Column Name** | **Bias** | **Potential Issue** |
| --- | --- | --- |
|  | **Risk** |  |
| **Gender** | Medium | If one gender is overrepresented, the model may develop gender bias. |
| **Senior Citizen** | High | Older customers may have different churn rates, leading to age discrimination. |
| **Partner** | Medium | Being married or single could affect churn predictions unfairly. |
| **Dependents** | Medium | Customers with dependents might behave differently, influencing model outcomes. |
| **Tenure** | High | Short-term customers are more likely to churn, which may bias results. |
| **Payment Method** | High | If electronic check users churn more, it may lead to bias against certain financial groups. |
| **Monthly Charges** | High | Higher costs may be linked to churn, causing income-based bias. |

**Step 1: Identify Columns That May Introduce Bias**

Certain columns in the dataset may create **unfair or skewed predictions** in churn analysis. Below are some high-risk columns:

**Step 2: How Bias May Affect Analysis**

* **Gender Bias** → If one gender shows higher churn, models might assume the same for all customers.
* **Age Bias (Senior Citizen)** → Older customers might churn more due to **digital literacy** or **service needs**, but a biased model may unfairly penalize them.
* **Financial Bias (Payment Method & Monthly Charges)** → Certain payment methods or **higher bills** might correlate with churn, unfairly affecting low-income users.