**📊 Columns in Customer Churn Dataset**

**1. customerID**

* **Type:** Identifier (string)
* **Role in churn prediction:** ❌ Not useful (only an ID, no predictive value).
* **Action:** Drop this column before modeling.

**2. gender**

* **Type:** Categorical (Male, Female)
* **Role:**
  + Tells whether customer is male/female.
  + Studies show **gender doesn’t strongly impact churn**.
* **Action:** Keep, but low importance. (Useful for fairness checks).

**3. SeniorCitizen**

* **Type:** Binary (0 = No, 1 = Yes)
* **Role:**
  + Senior citizens may have different service needs, tech adoption, or churn behavior.
  + Often **senior customers churn slightly more**.
* **Action:** Important demographic feature.

**4. Partner**

* **Type:** Categorical (Yes, No)
* **Role:**
  + Customers with partners may be more stable (less churn).
  + Indicates **social/family support → reduces churn**.
* **Action:** Useful demographic feature.

**5. Dependents**

* **Type:** Categorical (Yes, No)
* **Role:**
  + Customers with dependents (children/others) tend to churn less (family plan customers).
* **Action:** Important for churn behavior.

**6. tenure**

* **Type:** Numeric (months with company, 0–72)
* **Role:**
  + Strong predictor.
  + **Short-tenure customers churn more** (new customers leave faster).
  + **Long-tenure customers churn less** (loyal).
* **Action:** Very important.

**7. PhoneService**

* **Type:** Categorical (Yes, No)
* **Role:**
  + Customers with only internet (no phone) may churn differently.
  + Alone, not very strong predictor.
* **Action:** Keep.

**8. MultipleLines**

* **Type:** Categorical (Yes, No, No phone service)
* **Role:**
  + If customers have multiple phone lines, they’re **less likely to churn** (stickiness factor).
* **Action:** Medium importance.

**9. InternetService**

* **Type:** Categorical (DSL, Fiber optic, No)
* **Role:**
  + One of the strongest predictors.
  + **Fiber optic customers churn more** (higher cost, issues).
  + **DSL customers churn less**.
* **Action:** Very important.

**10. OnlineSecurity**

* **Type:** Categorical (Yes, No, No internet service)
* **Role:**
  + Customers without online security tend to churn more.
  + Value-added services → **stickiness**.
* **Action:** Important.

**11. OnlineBackup**

* **Type:** Categorical
* **Role:**
  + Similar to above: extra services make churn less likely.
* **Action:** Important.

**12. DeviceProtection**

* **Type:** Categorical
* **Role:**
  + Customers who subscribe to device protection are less likely to churn.
* **Action:** Medium importance.

**13. TechSupport**

* **Type:** Categorical
* **Role:**
  + Customers **without tech support** churn more (frustrated).
* **Action:** Very important.

**14. StreamingTV**

* **Type:** Categorical
* **Role:**
  + Mixed effect. Streaming services increase monthly charges → could increase churn if cost-sensitive.
* **Action:** Medium importance.

**15. StreamingMovies**

* **Type:** Categorical
* **Role:**
  + Similar to StreamingTV. Extra services may help retention or increase churn risk due to higher bills.
* **Action:** Medium importance.

**16. Contract**

* **Type:** Categorical (Month-to-month, One year, Two year)
* **Role:**
  + One of the **strongest predictors**.
  + **Month-to-month → high churn**.
  + **Two year → very low churn**.
* **Action:** Critical feature.

**17. PaperlessBilling**

* **Type:** Categorical (Yes, No)
* **Role:**
  + Customers with paperless billing often pay electronically.
  + Correlation shows **higher churn with paperless billing** (maybe linked to monthly contracts).
* **Action:** Medium importance.

**18. PaymentMethod**

* **Type:** Categorical (Electronic check, Mailed check, Bank transfer, Credit card)
* **Role:**
  + **Electronic check users churn the most**.
  + Automatic payments (credit card/bank) → lower churn.
* **Action:** Very important.

**19. MonthlyCharges**

* **Type:** Numeric
* **Role:**
  + Strong predictor.
  + **Higher monthly charges → more churn** (cost-sensitive).
* **Action:** Very important.

**20. TotalCharges**

* **Type:** Numeric
* **Role:**
  + Total revenue from customer.
  + Correlated with tenure (loyal customers accumulate more).
  + Lower total charges often indicate **new customers → higher churn**.
* **Action:** Important, but similar info to tenure.

**21. Churn**

* **Type:** Target variable (Yes = 1, No = 0)
* **Role:** Outcome we predict.

**🏆 Summary: Most Important Features for Churn**

From EDA and feature importance (industry knowledge + dataset analysis), the **top churn drivers** are:

* **Contract type** (month-to-month highest churn)
* **Tenure** (new customers churn more)
* **Internet service type** (fiber optic churns more)
* **MonthlyCharges** (higher = more churn)
* **PaymentMethod** (electronic check risky)
* **TechSupport, OnlineSecurity** (no support/security → higher churn)

👉 In an **interview**, you can say:

“The dataset has demographic, account, and service-related features.  
Demographics like gender and partner have small impact,  
but service & contract-related features like *tenure, contract type, internet service, and monthly charges* are the strongest churn predictors.  
This aligns with real-world business logic: short-term, high-cost customers are more likely to leave.”

**📌 Feature Importance Ranking (Customer Churn Prediction)**

| **Rank** | **Feature** | **Importance (High / Medium / Low)** | **Reason / Impact on Churn** |
| --- | --- | --- | --- |
| 1️⃣ | **Contract** | ⭐ High | Month-to-month customers churn the most. Yearly contracts reduce churn drastically. |
| 2️⃣ | **Tenure** | ⭐ High | New customers (low tenure) leave quickly. Long-tenure customers are loyal. |
| 3️⃣ | **MonthlyCharges** | ⭐ High | Higher bills → more churn (cost-sensitive customers). |
| 4️⃣ | **InternetService** | ⭐ High | Fiber optic customers churn more (higher cost/issues), DSL customers churn less. |
| 5️⃣ | **PaymentMethod** | ⭐ High | Customers paying via *Electronic Check* churn more. Auto-pay methods reduce churn. |
| 6️⃣ | **TechSupport** | ⭐ High | No tech support → higher churn. Customers stay when help is available. |
| 7️⃣ | **OnlineSecurity** | ⭐ High | Security service reduces churn (customers feel safe). |
| 8️⃣ | **TotalCharges** | ⭐ Medium | Related to tenure. Low total charges = new customers → more churn. |
| 9️⃣ | **PaperlessBilling** | ⭐ Medium | Customers with paperless billing churn more (often linked to month-to-month contracts). |
| 🔟 | **OnlineBackup** | Medium | Value-added services help reduce churn slightly. |
| 1️⃣1️⃣ | **DeviceProtection** | Medium | Customers with device protection show lower churn. |
| 1️⃣2️⃣ | **StreamingTV / StreamingMovies** | Medium | Mixed effect. Adds stickiness but also raises charges (sometimes higher churn). |
| 1️⃣3️⃣ | **MultipleLines** | Low | Extra phone lines = slightly lower churn (stickiness). |
| 1️⃣4️⃣ | **PhoneService** | Low | Minimal direct impact. |
| 1️⃣5️⃣ | **Partner** | Low | Customers with partners churn slightly less. |
| 1️⃣6️⃣ | **Dependents** | Low | Customers with dependents churn less (family plans). |
| 1️⃣7️⃣ | **SeniorCitizen** | Low | Seniors churn slightly more, but weak predictor. |
| 1️⃣8️⃣ | **Gender** | Very Low | Almost no difference in churn rates. |
| 1️⃣9️⃣ | **customerID** | ❌ None | Just an identifier, not used in modeling. |

**🏆 Interview-Ready Summary**

If asked in campus interview:

👉 *“The strongest churn drivers are service & contract features, not demographics.  
Contract type, tenure, monthly charges, internet service, and payment method are the* ***top predictors****.  
Features like gender or senior citizen status have little impact.  
This makes sense because churn is more about service experience and billing than about personal demographics.”*