

# EDA Summary

Source file: `./data/raw/WA_Fn-UseC_-Telco-Customer-Churn.csv`

Rows: 7,043

Columns: 21

## Duplicate Summary:

- Duplicate ID groups: total=0, exact=0, conflicting=0
- Full-row duplicates (including ID): 0
- Full-row duplicates (excluding ID): 42

## Notes:

- No data has been mutated.
- Hidden missingness and numeric coercion preview provided to support decisions.
- Edge-case summary captures tenure==0 / blank TotalCharges / zero MonthlyCharges relationships.

# Schema Overview (dtype, unique, missing variants) (page 1/1)

column	dtype	non_null	unique	na_count	empty_str_count	whitespace_only_count
Churn	object	7043	2	0	0	0
Contract	object	7043	3	0	0	0
Dependents	object	7043	2	0	0	0
DeviceProtection	object	7043	3	0	0	0
InternetService	object	7043	3	0	0	0
MonthlyCharges	float64	7043	1585	0	0	0
MultipleLines	object	7043	3	0	0	0
OnlineBackup	object	7043	3	0	0	0
OnlineSecurity	object	7043	3	0	0	0
PaperlessBilling	object	7043	2	0	0	0
Partner	object	7043	2	0	0	0
PaymentMethod	object	7043	4	0	0	0
PhoneService	object	7043	2	0	0	0
SeniorCitizen	int64	7043	2	0	0	0
StreamingMovies	object	7043	3	0	0	0
StreamingTV	object	7043	3	0	0	0
TechSupport	object	7043	3	0	0	0
TotalCharges	object	7043	6531	0	0	11
customerID	object	7043	7043	0	0	0
gender	object	7043	2	0	0	0
tenure	int64	7043	73	0	0	0

column	dtype	non_null	unique	na_count	empty_str_count	whitespace_only_count
TotalCharges	object	7043	6531	0	0	11

# Numeric Coercion Preview (object columns -> numeric) (page 1/1)

column	dtype_now	non_numeric_if_coerced	total_rows
customerID	object	7043	7043
gender	object	7043	7043
PaymentMethod	object	7043	7043
PaperlessBilling	object	7043	7043
Contract	object	7043	7043
StreamingMovies	object	7043	7043
StreamingTV	object	7043	7043
TechSupport	object	7043	7043
DeviceProtection	object	7043	7043
OnlineBackup	object	7043	7043
OnlineSecurity	object	7043	7043
InternetService	object	7043	7043
MultipleLines	object	7043	7043
PhoneService	object	7043	7043
Dependents	object	7043	7043
Partner	object	7043	7043
Churn	object	7043	7043
TotalCharges	object	11	7043

## Edge-case Summary (tenure / charges)

Rows: 7043

tenure == 0: 11

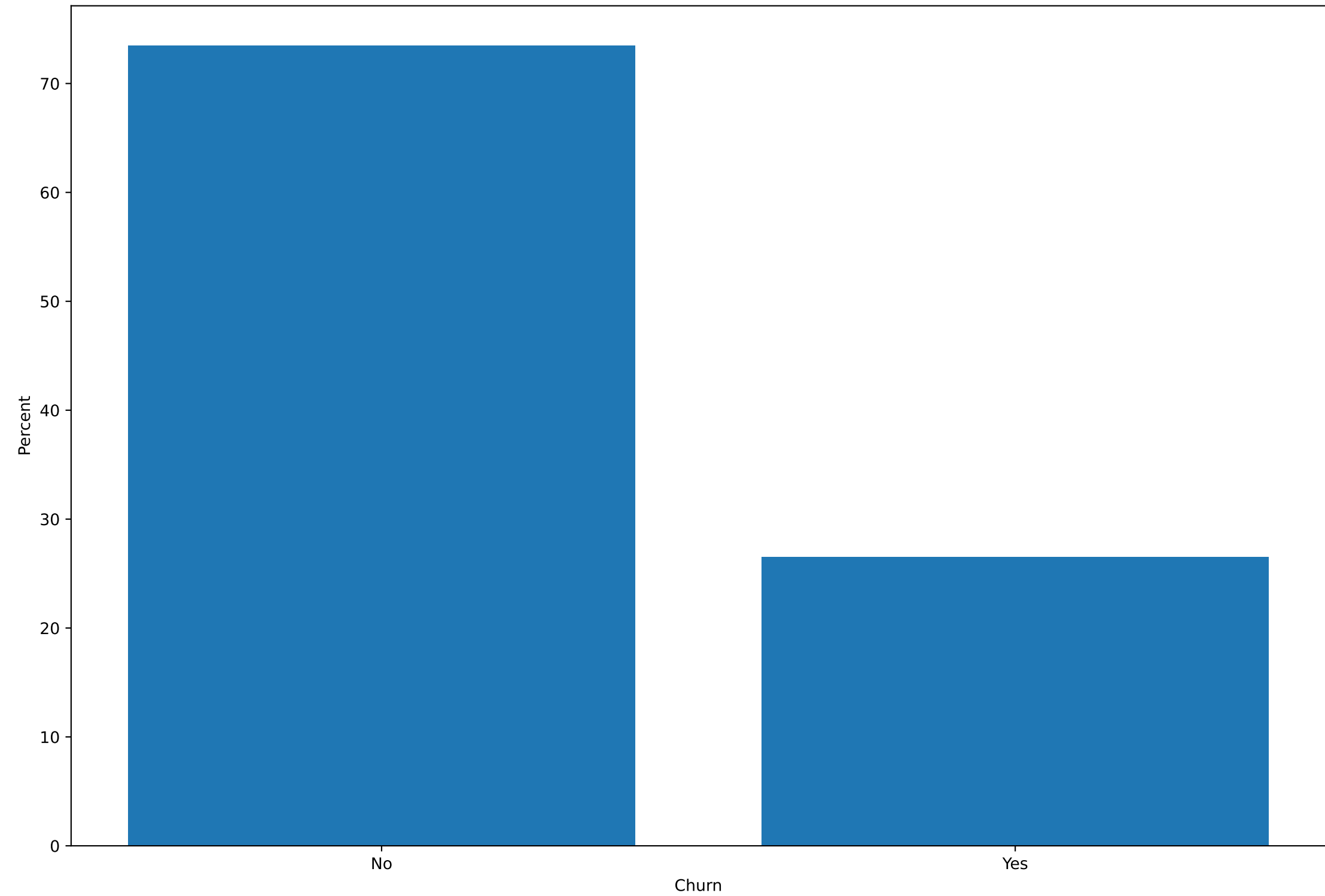
MonthlyCharges == 0: 0

TotalCharges blank/empty: 11

All TotalCharges blank  $\Rightarrow$  tenure==0: True

All tenure==0  $\Rightarrow$  TotalCharges blank: True

Churn Distribution



Churn Distribution (Counts & Percentages) (page 1/1)

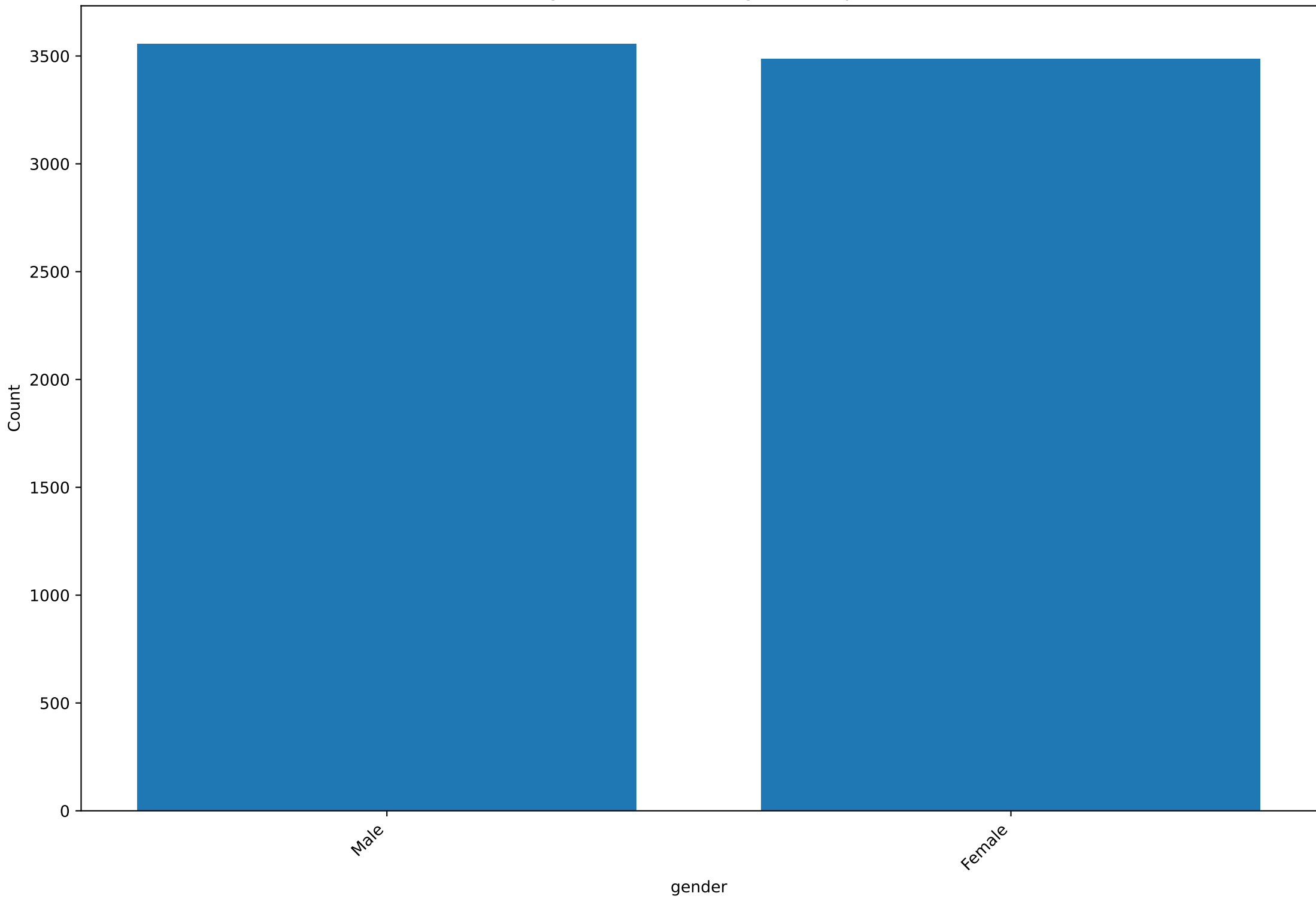
Churn	count	percent
No	5174	73.4630129206304
Yes	1869	26.536987079369588

## Special Placeholder Tokens (counts) (page 1/1)

column	placeholder	count
DeviceProtection	No internet service	1526
OnlineBackup	No internet service	1526
OnlineSecurity	No internet service	1526
StreamingMovies	No internet service	1526
StreamingTV	No internet service	1526
TechSupport	No internet service	1526
MultipleLines	No phone service	682



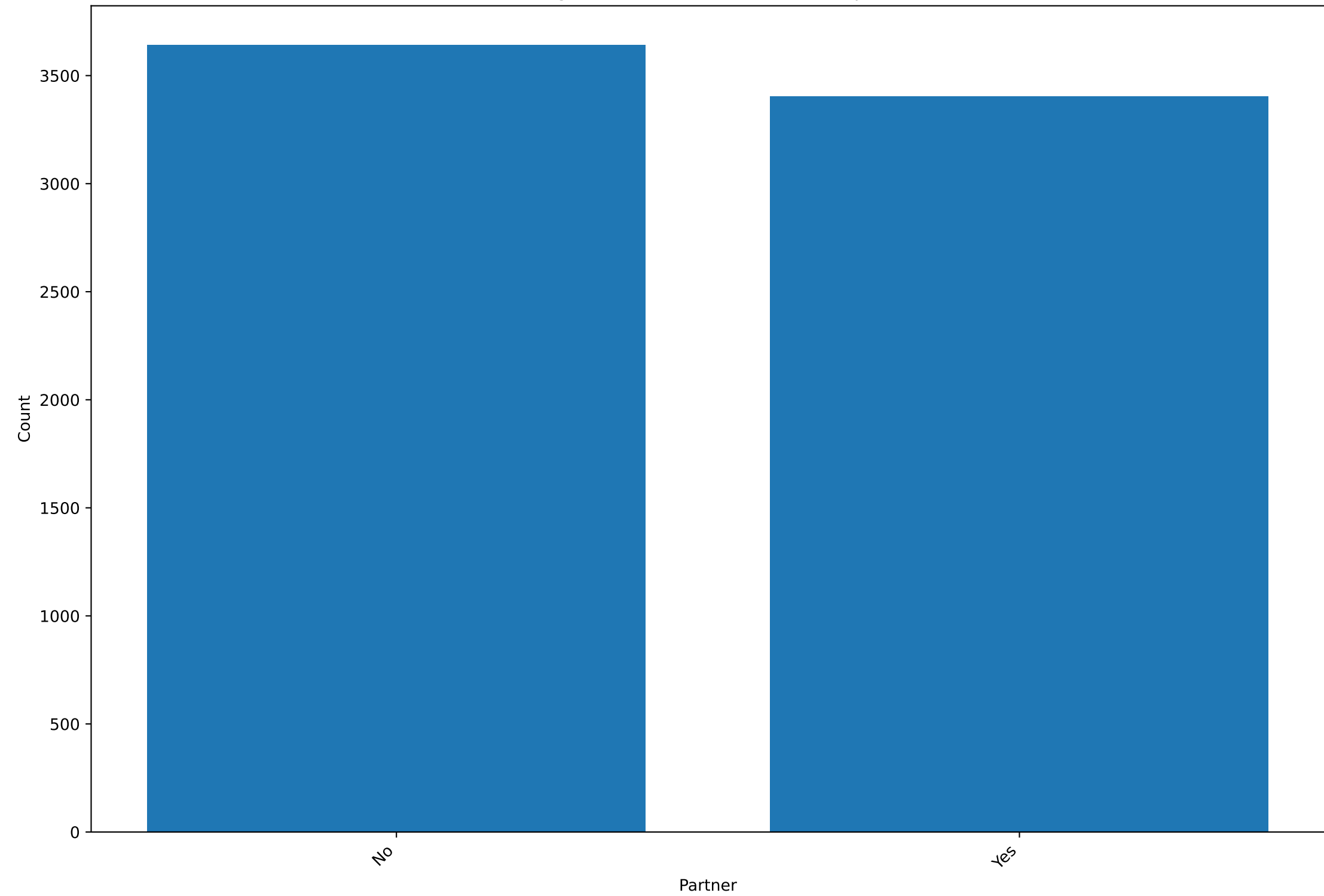
Categorical Distribution: gender (Top 10)



Top-10 Values: gender (page 1/1)

value	count	percent
Male	3555	50.4756495811444
Female	3488	49.5243504188556

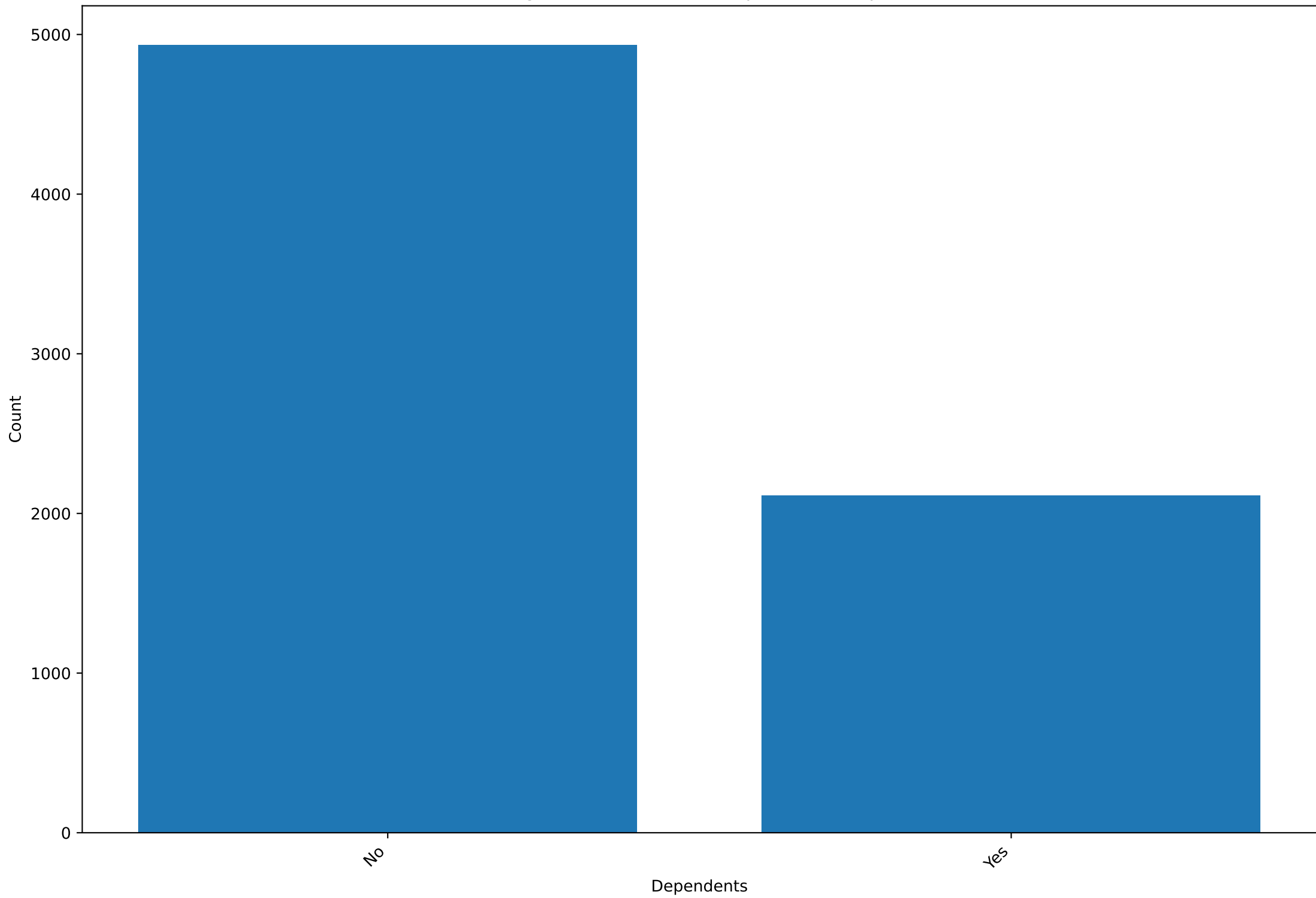
Categorical Distribution: Partner (Top 10)



## Top-10 Values: Partner (page 1/1)

value	count	percent
No	3641	51.696720147664344
Yes	3402	48.30327985233565

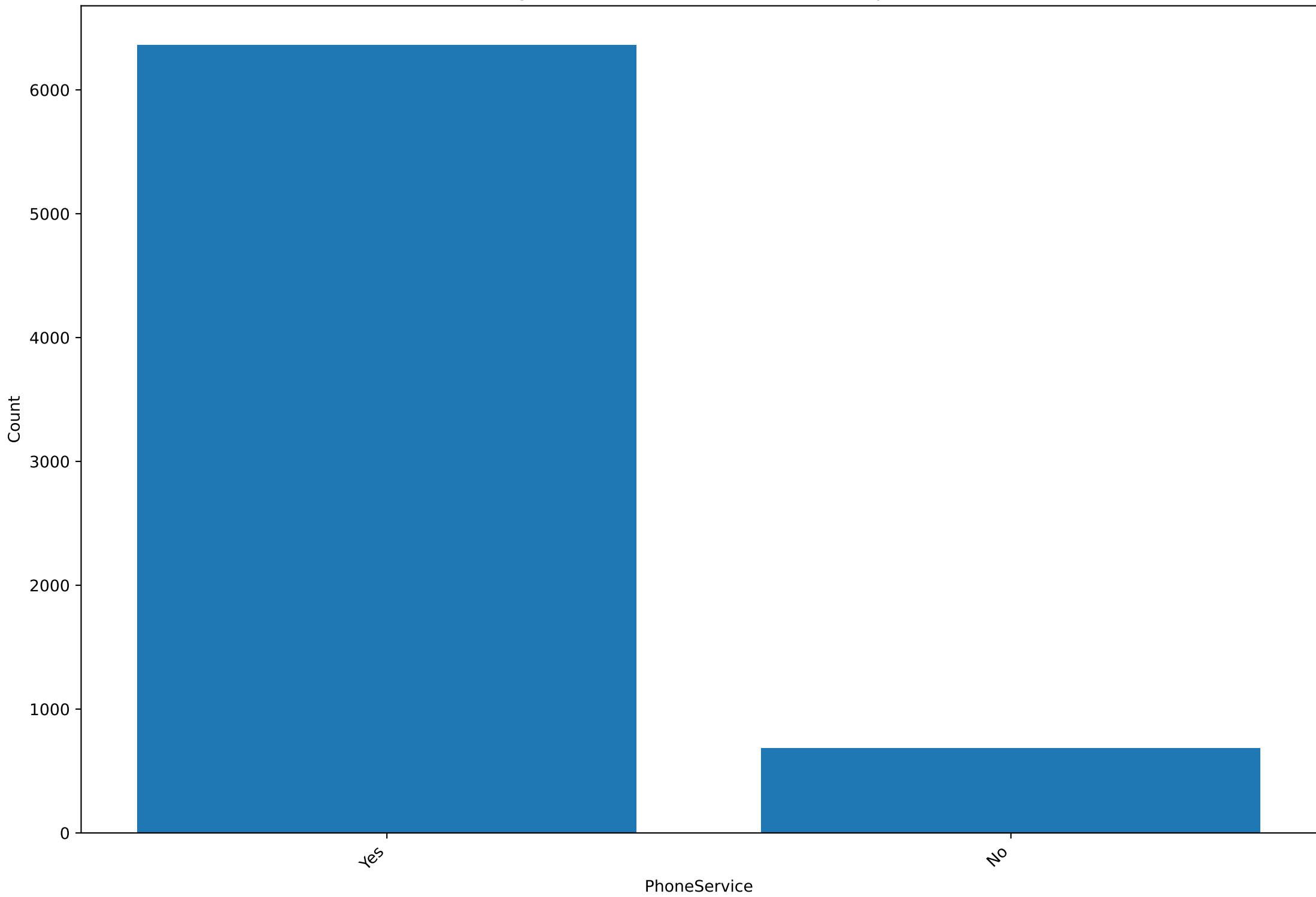
Categorical Distribution: Dependents (Top 10)



## Top-10 Values: Dependents (page 1/1)

value	count	percent
No	4933	70.04117563538264
Yes	2110	29.95882436461735

Categorical Distribution: PhoneService (Top 10)

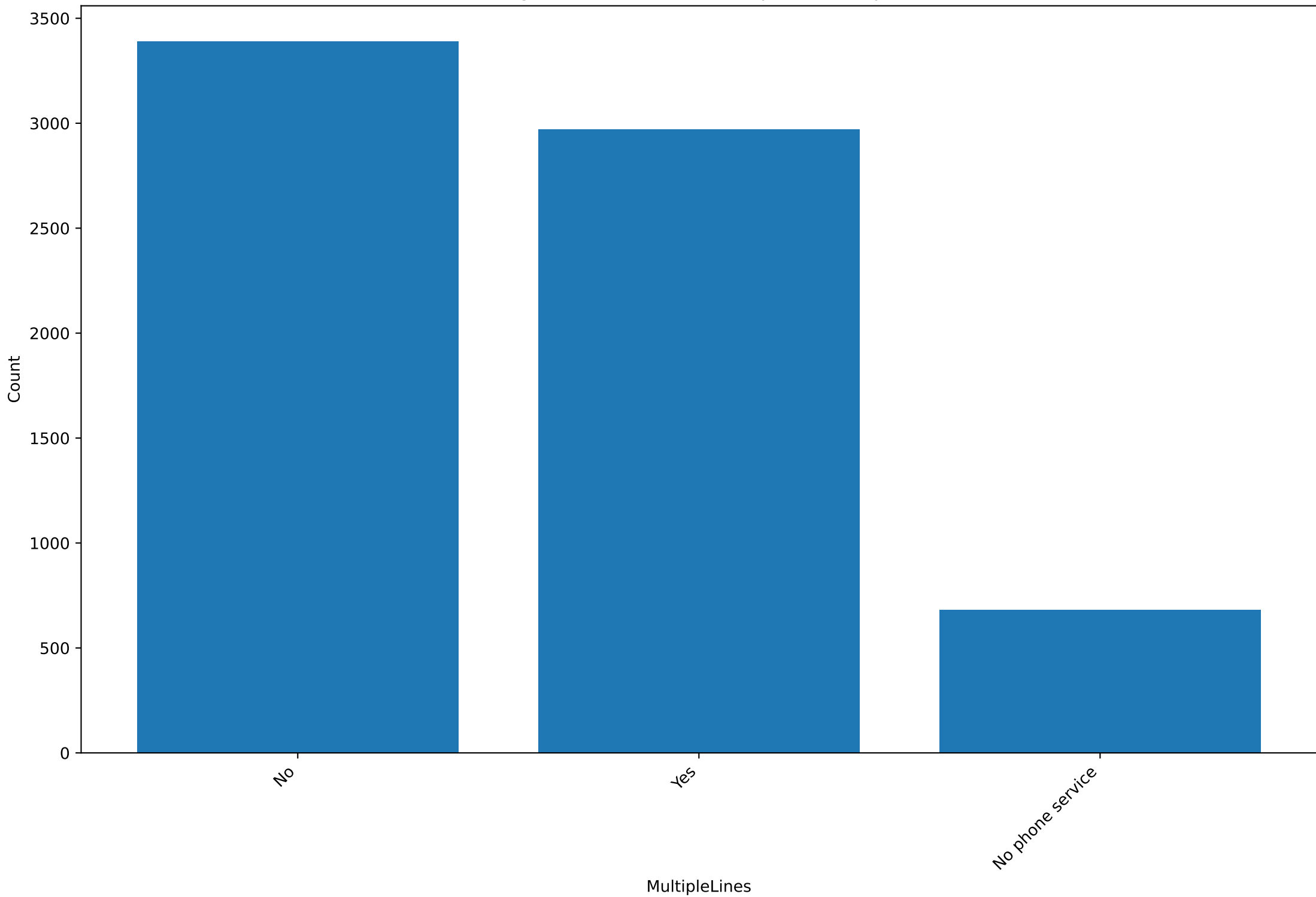


## Top-10 Values: PhoneService (page 1/1)

value	count	percent
Yes	6361	90.31662643759762
No	682	9.683373562402386



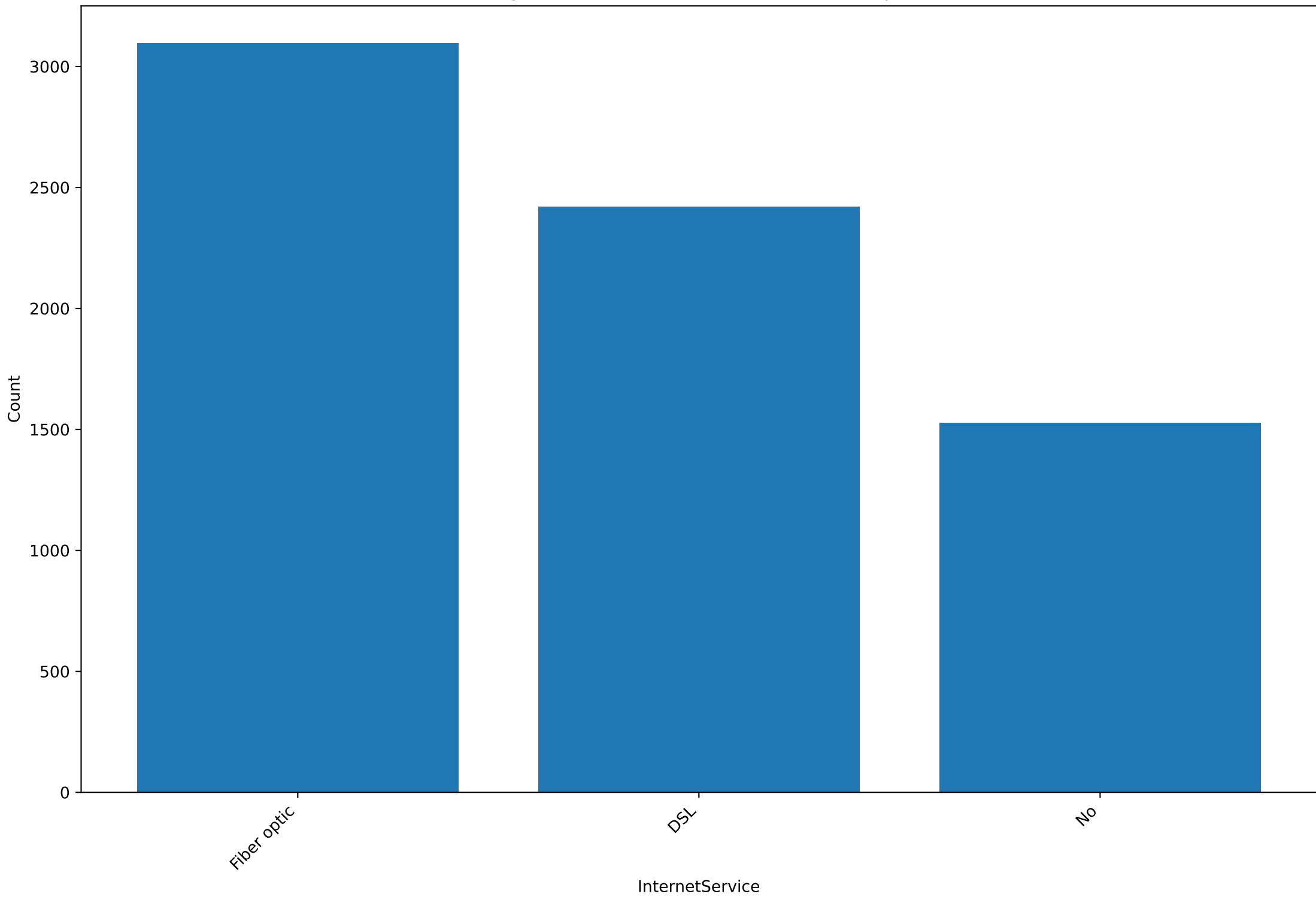
Categorical Distribution: MultipleLines (Top 10)



Top-10 Values: MultipleLines (page 1/1)

value	count	percent
No	3390	48.13289791282124
Yes	2971	42.18372852477638
No phone service	682	9.683373562402386

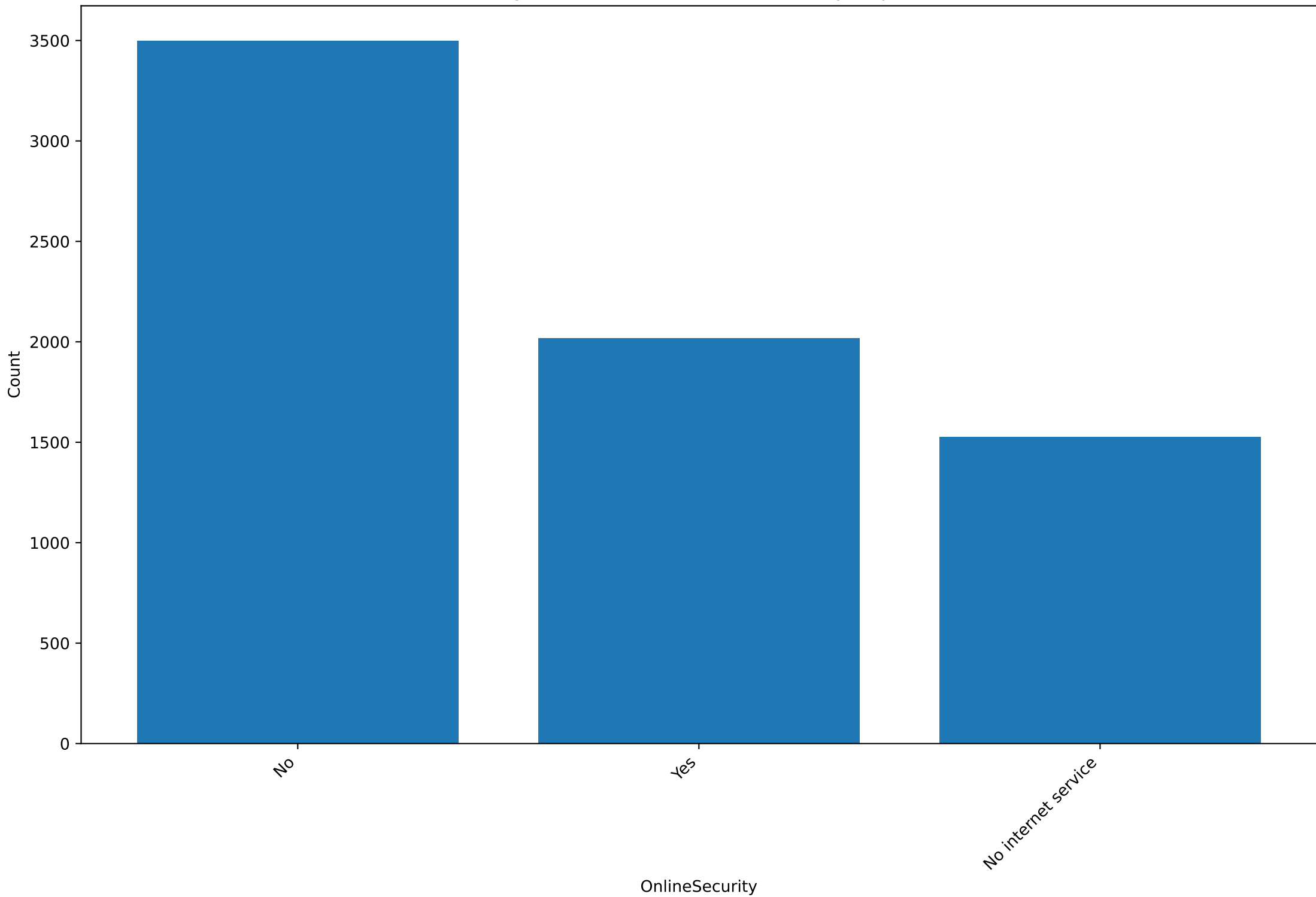
Categorical Distribution: InternetService (Top 10)



## Top-10 Values: InternetService (page 1/1)

value	count	percent
Fiber optic	3096	43.958540394718156
DSL	2421	34.37455629703251
No	1526	21.666903308249324

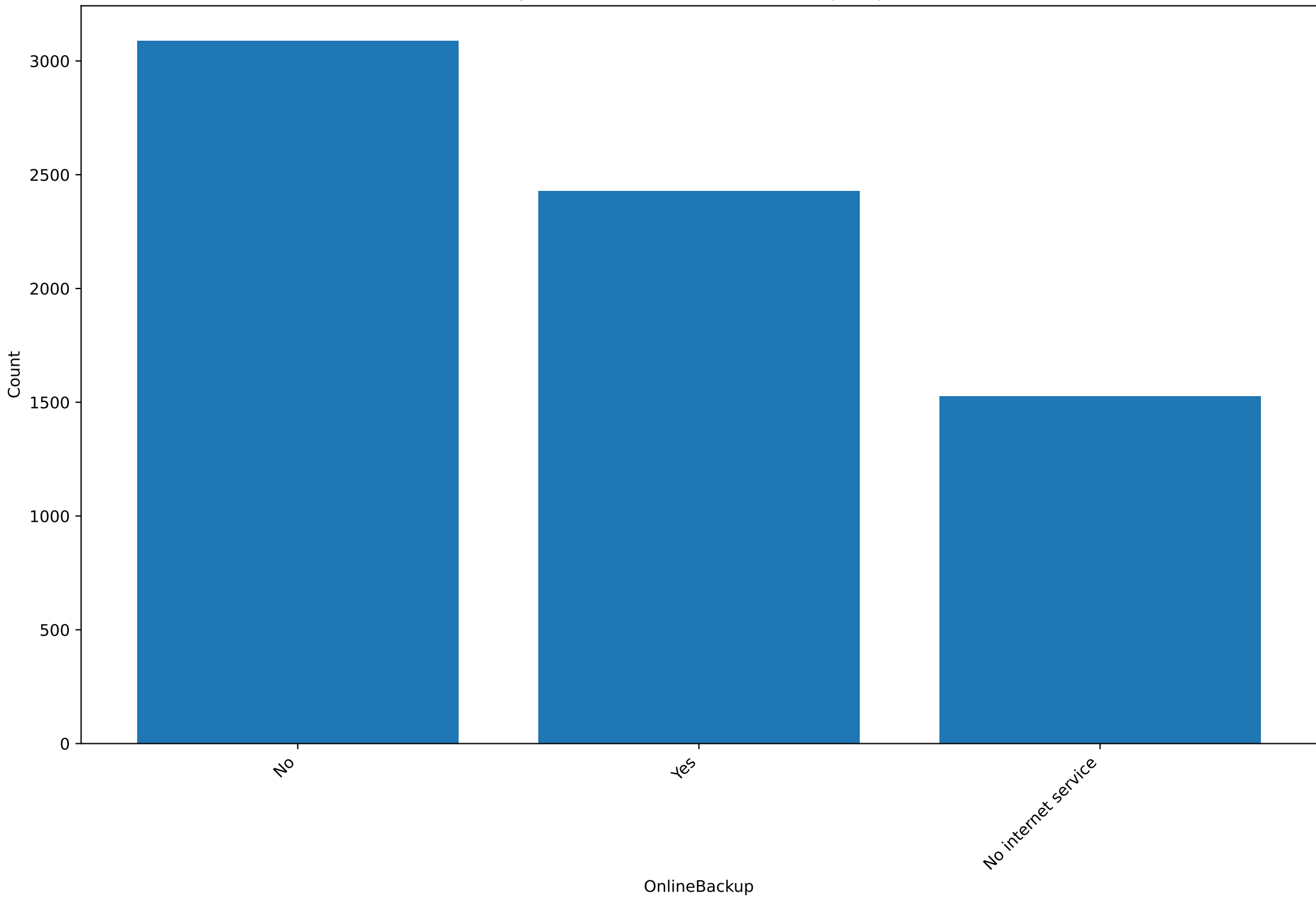
Categorical Distribution: OnlineSecurity (Top 10)



Top-10 Values: OnlineSecurity (page 1/1)

value	count	percent
No	3498	49.666335368450945
Yes	2019	28.666761323299728
No internet service	1526	21.666903308249324

Categorical Distribution: OnlineBackup (Top 10)

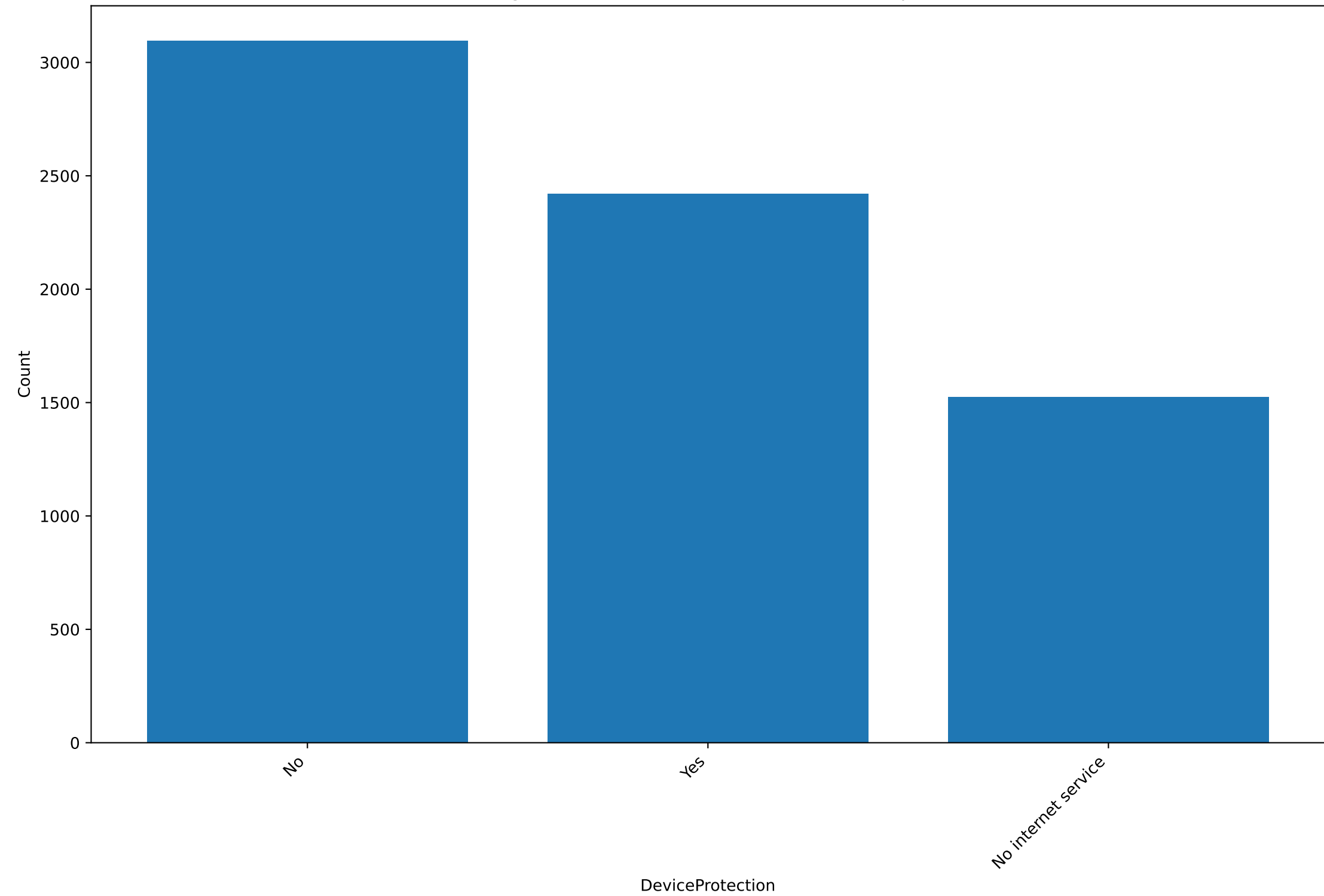


## Top-10 Values: OnlineBackup (page 1/1)

value	count	percent
No	3088	43.84495243504188
Yes	2429	34.48814425670879
No internet service	1526	21.666903308249324



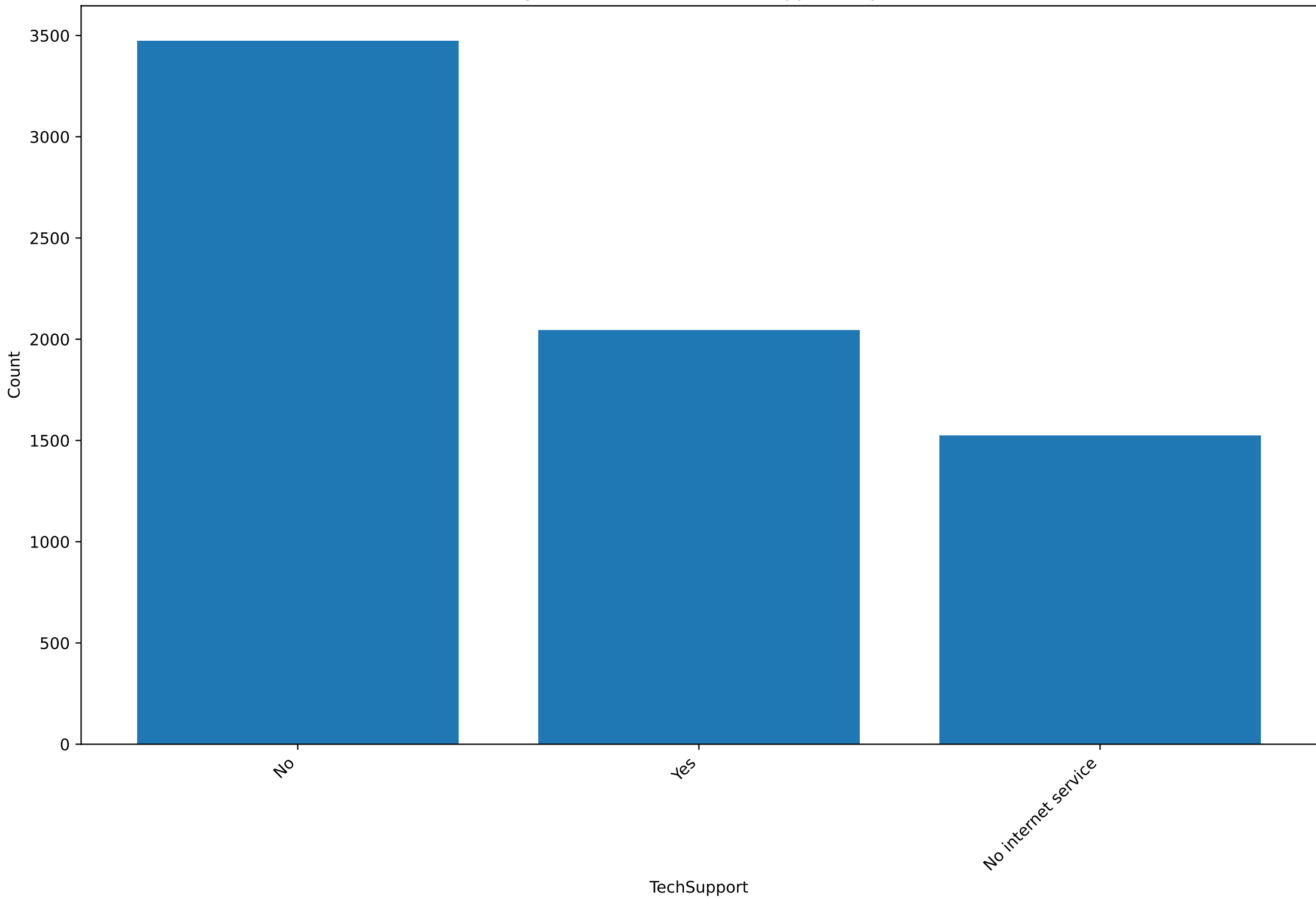
Categorical Distribution: DeviceProtection (Top 10)



Top-10 Values: DeviceProtection (page 1/1)

value	count	percent
No	3095	43.944341899758626
Yes	2422	34.38875479199205
No internet service	1526	21.666903308249324

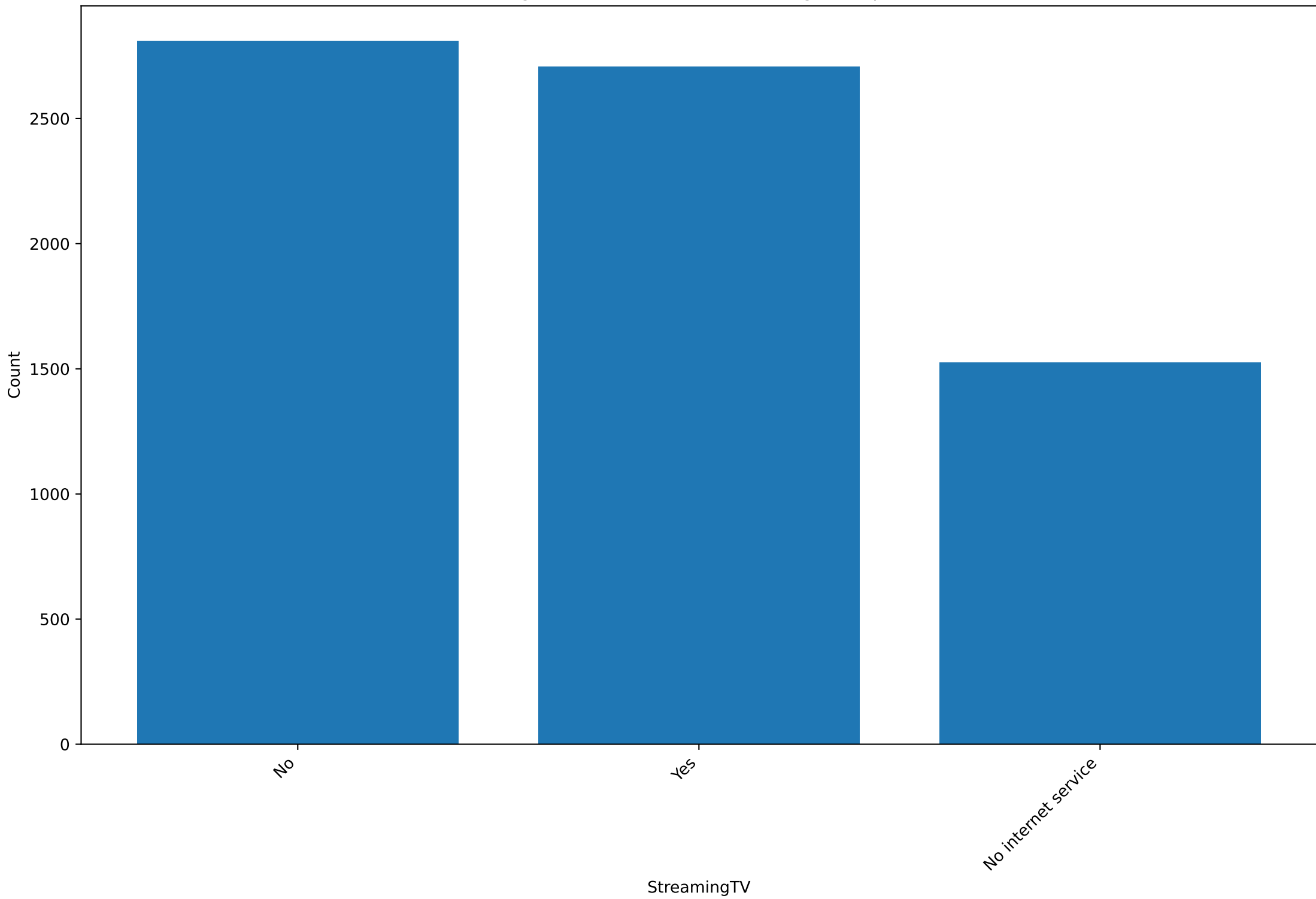
Categorical Distribution: TechSupport (Top 10)



Top-10 Values: TechSupport (page 1/1)

value	count	percent
No	3473	49.31137299446259
Yes	2044	29.02172369728809
No internet service	1526	21.666903308249324

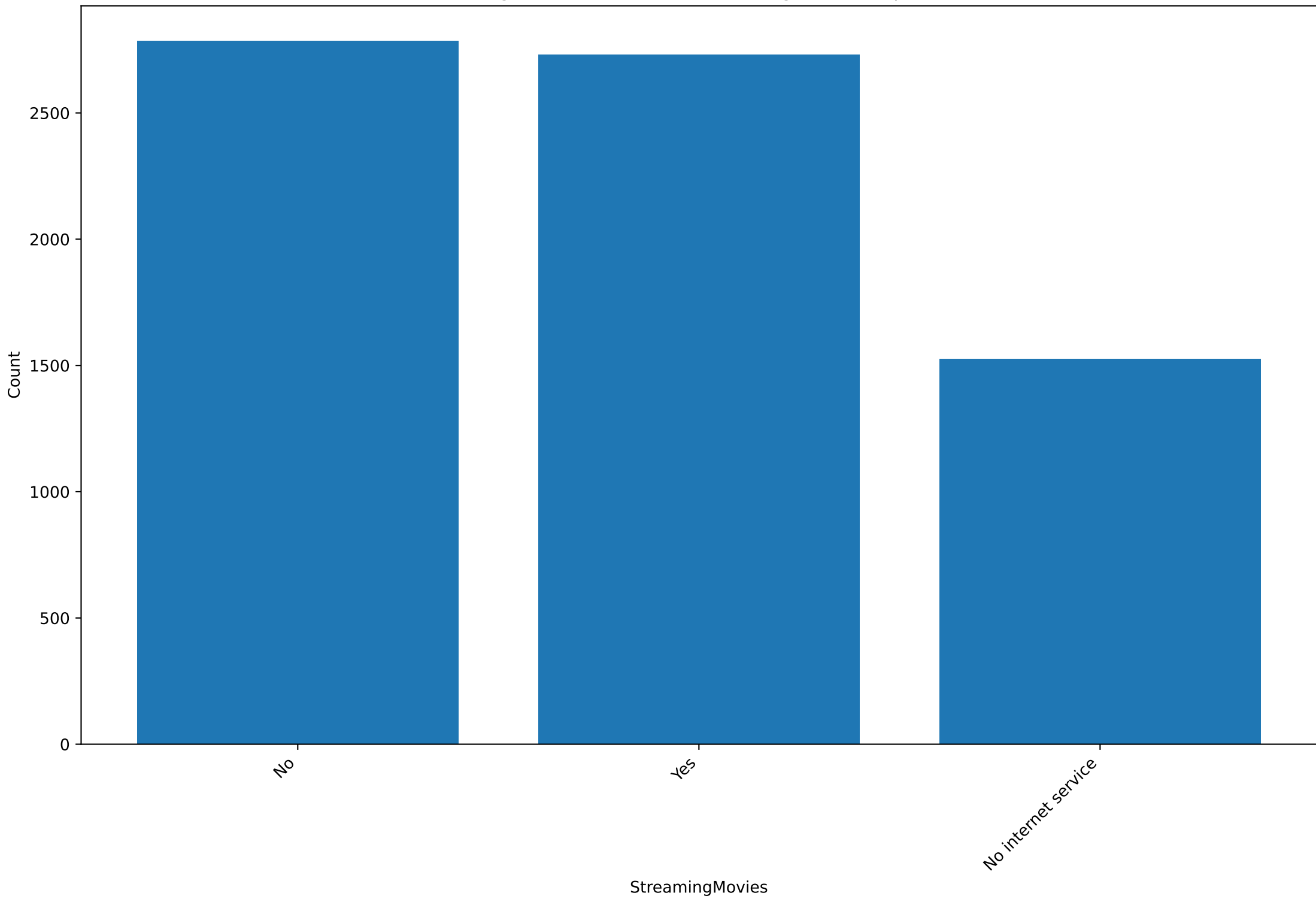
Categorical Distribution: StreamingTV (Top 10)



Top-10 Values: StreamingTV (page 1/1)

value	count	percent
No	2810	39.89777083629135
Yes	2707	38.435325855459325
No internet service	1526	21.666903308249324

Categorical Distribution: StreamingMovies (Top 10)

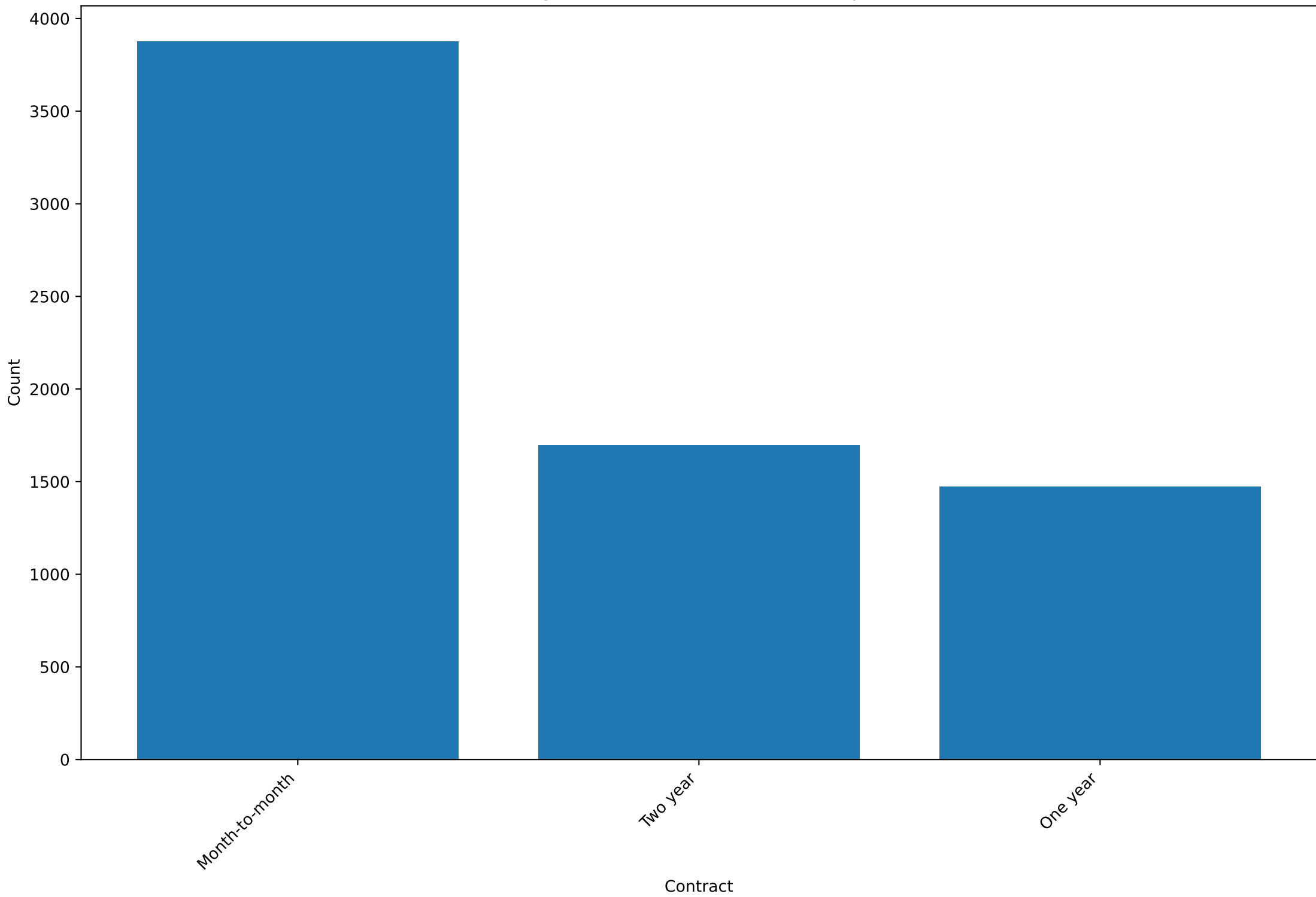


Top-10 Values: StreamingMovies (page 1/1)

value	count	percent
No	2785	39.542808462303
Yes	2732	38.790288229447675
No internet service	1526	21.666903308249324



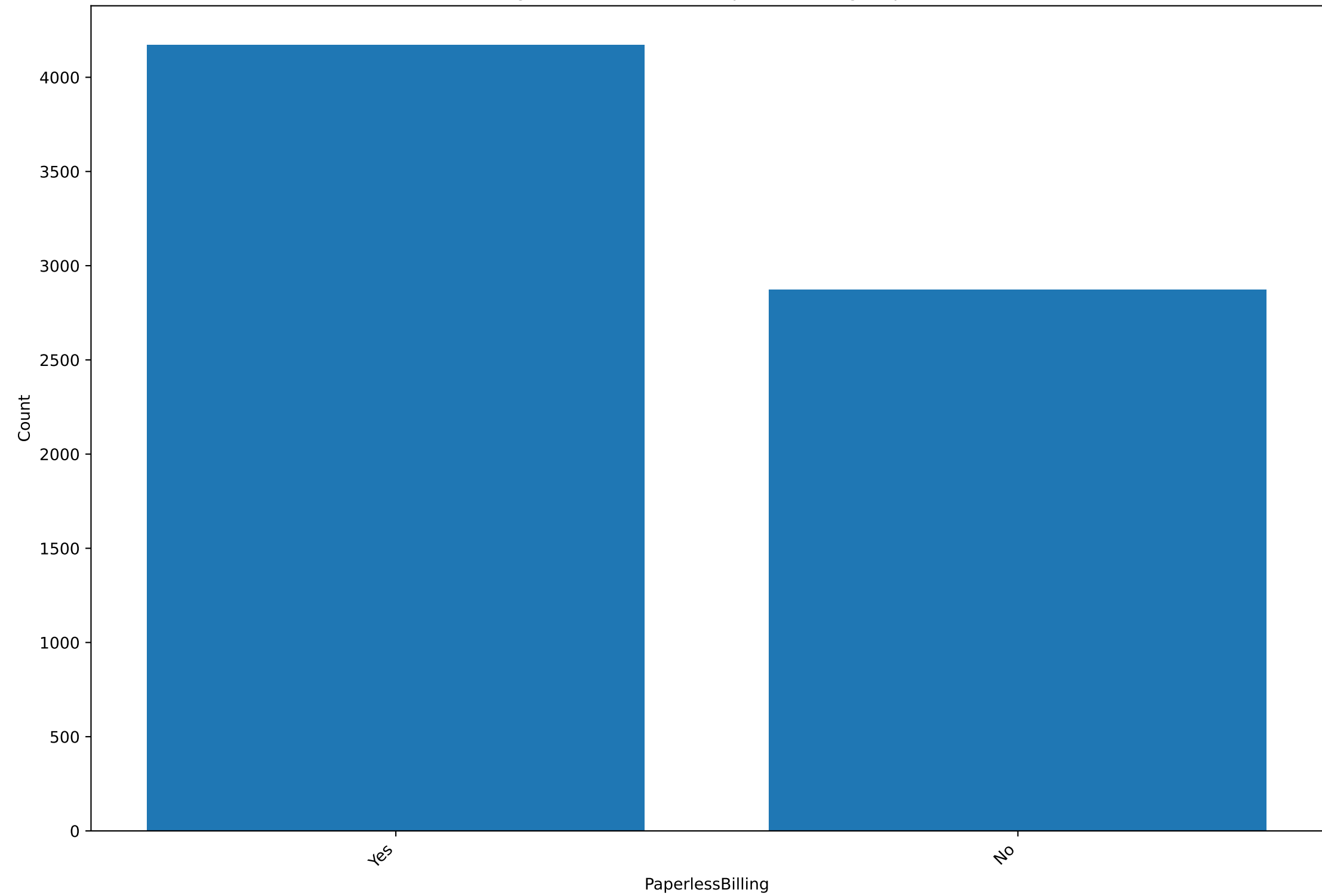
Categorical Distribution: Contract (Top 10)



Top-10 Values: Contract (page 1/1)

value	count	percent
Month-to-month	3875	55.01916796819537
Two year	1695	24.06644895641062
One year	1473	20.914383075394007

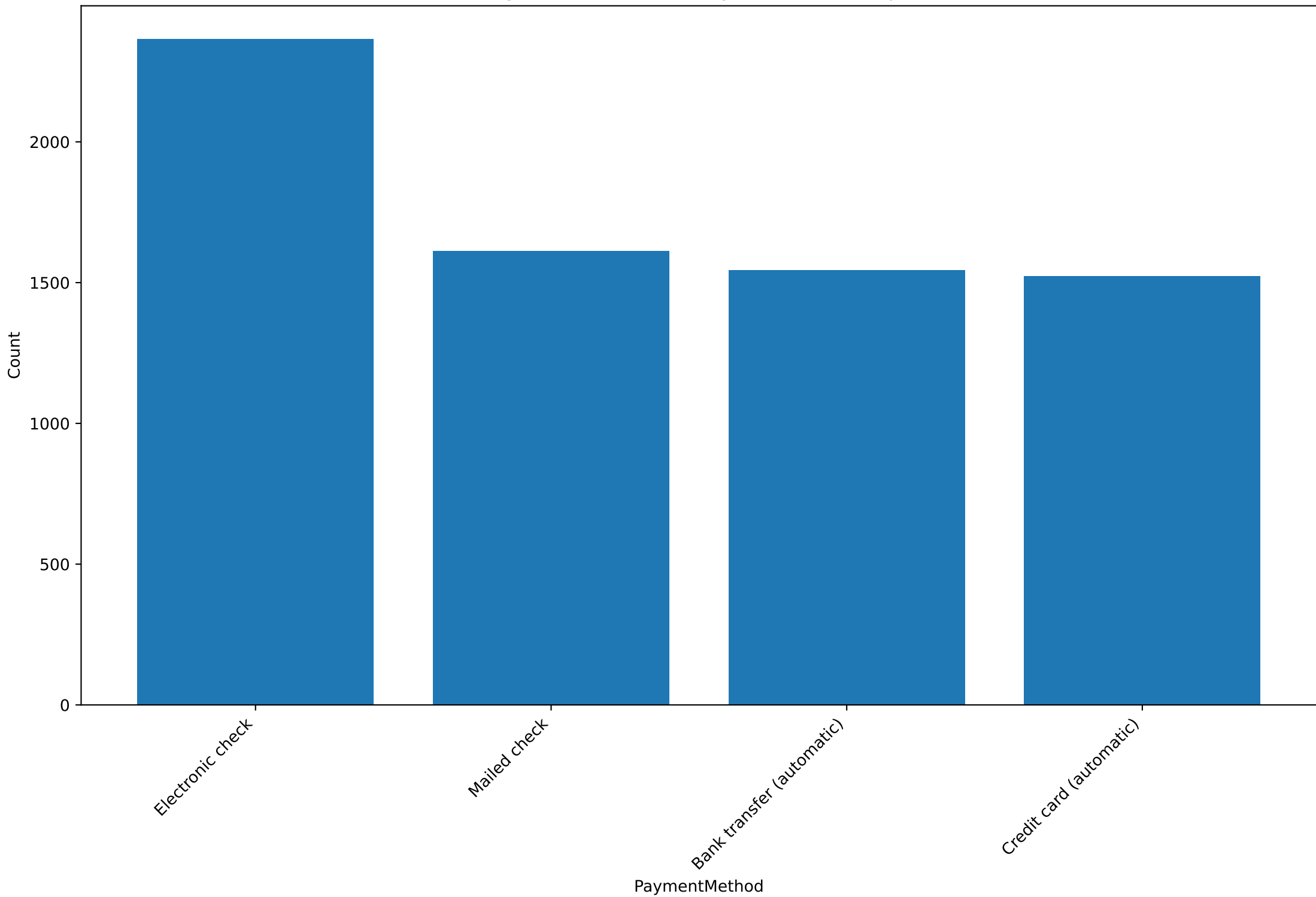
Categorical Distribution: PaperlessBilling (Top 10)



## Top-10 Values: PaperlessBilling (page 1/1)

value	count	percent
Yes	4171	59.22192247621753
No	2872	40.77807752378248

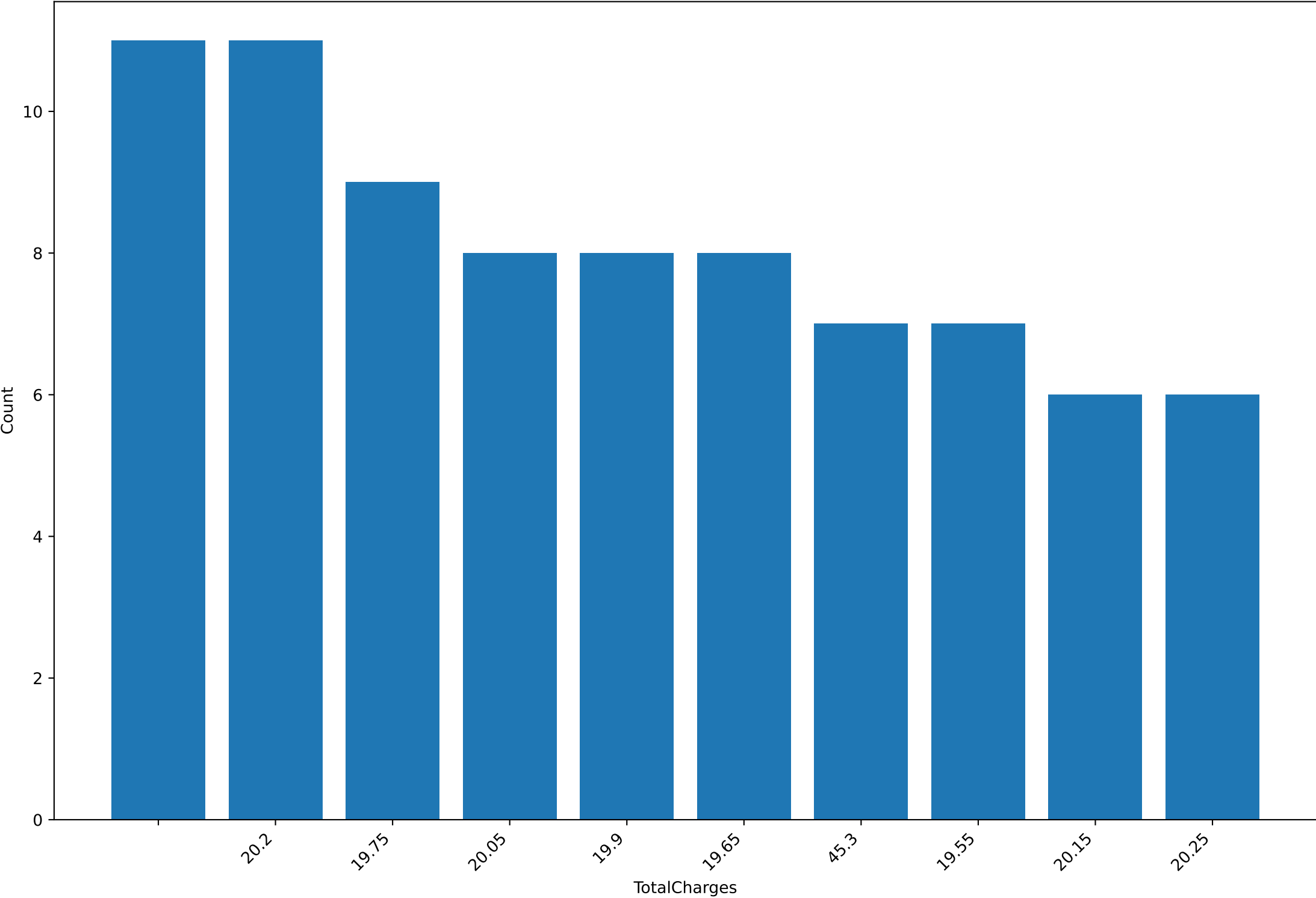
Categorical Distribution: PaymentMethod (Top 10)



## Top-10 Values: PaymentMethod (page 1/1)

value	count	percent
Electronic check	2365	33.57944057929859
Mailed check	1612	22.887973874769273
Bank transfer (automatic)	1544	21.92247621752094
Credit card (automatic)	1522	21.61010932841119

Categorical Distribution: TotalCharges (Top 10)

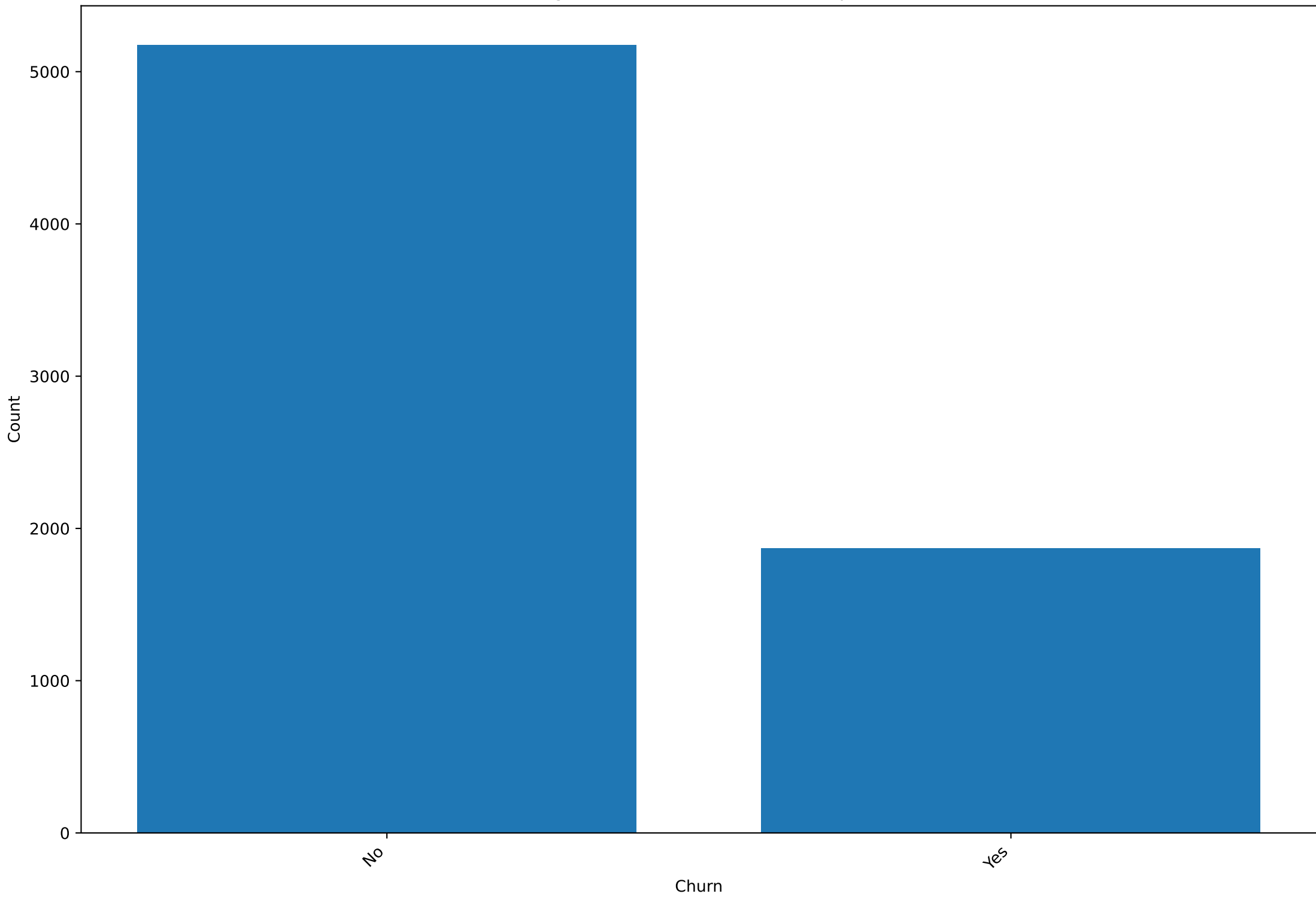


## Top-10 Values: TotalCharges (page 1/1)

value	count	percent
	11	0.1561834445548772
20.2	11	0.1561834445548772
19.75	9	0.1277864546358086
20.05	8	0.11358795967627432
19.9	8	0.11358795967627432
19.65	8	0.11358795967627432
45.3	7	0.09938946471674004
19.55	7	0.09938946471674004
20.15	6	0.08519096975720573
20.25	6	0.08519096975720573



Categorical Distribution: Churn (Top 10)



Top-10 Values: Churn (page 1/1)

value	count	percent
No	5174	73.4630129206304
Yes	1869	26.536987079369588

## Churn-Rate Columns (auto-selected)

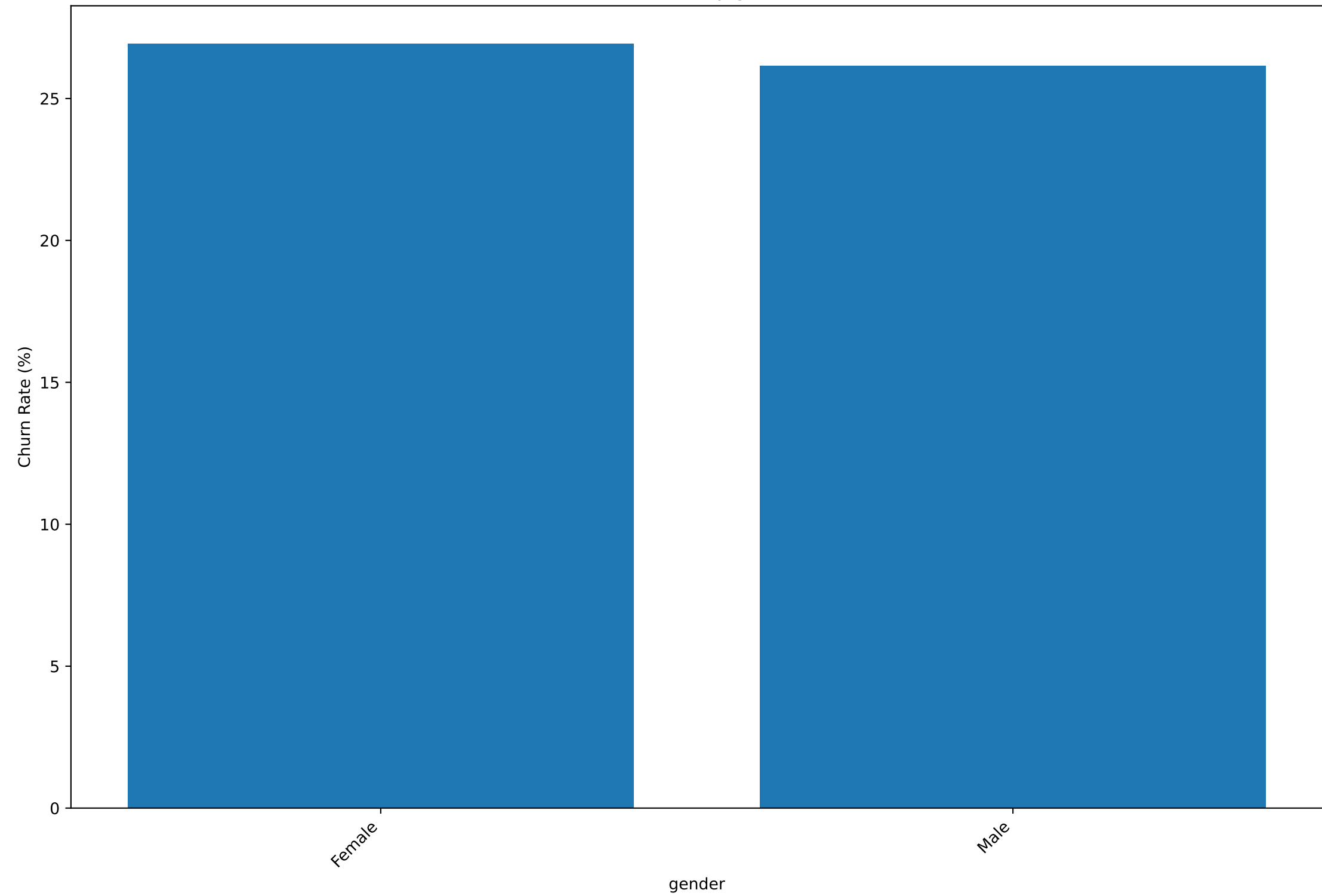
Selected columns:

gender, Partner, Dependents, PhoneService, MultipleLines, InternetService

OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport, StreamingTV, StreamingMovies

Contract, PaperlessBilling, PaymentMethod

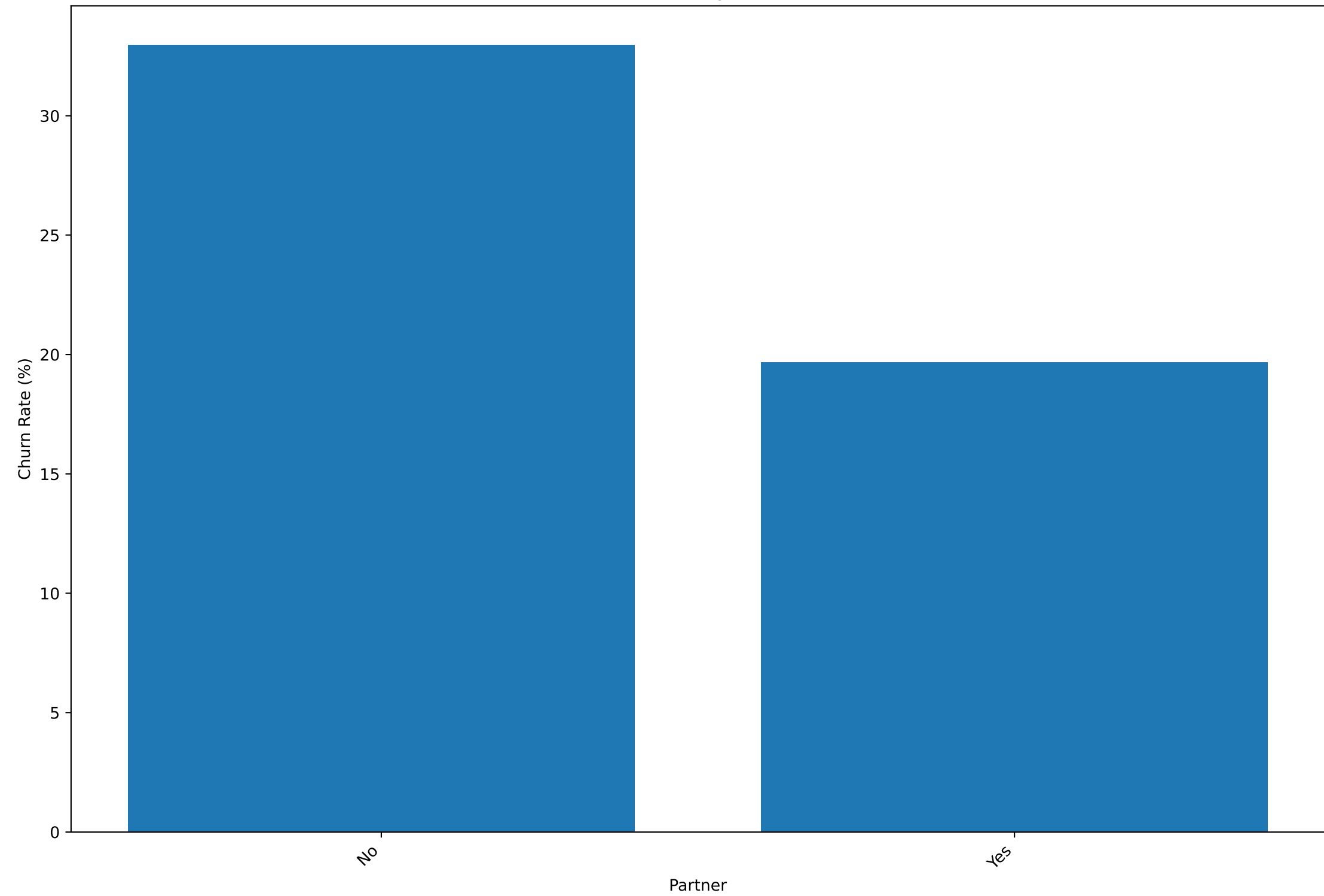
Churn Rate by gender



Churn Rate by gender (counts + %) (page 1/1)

gender	count	churn_rate_percent
Female	3488	26.920871559633024
Male	3555	26.160337552742618

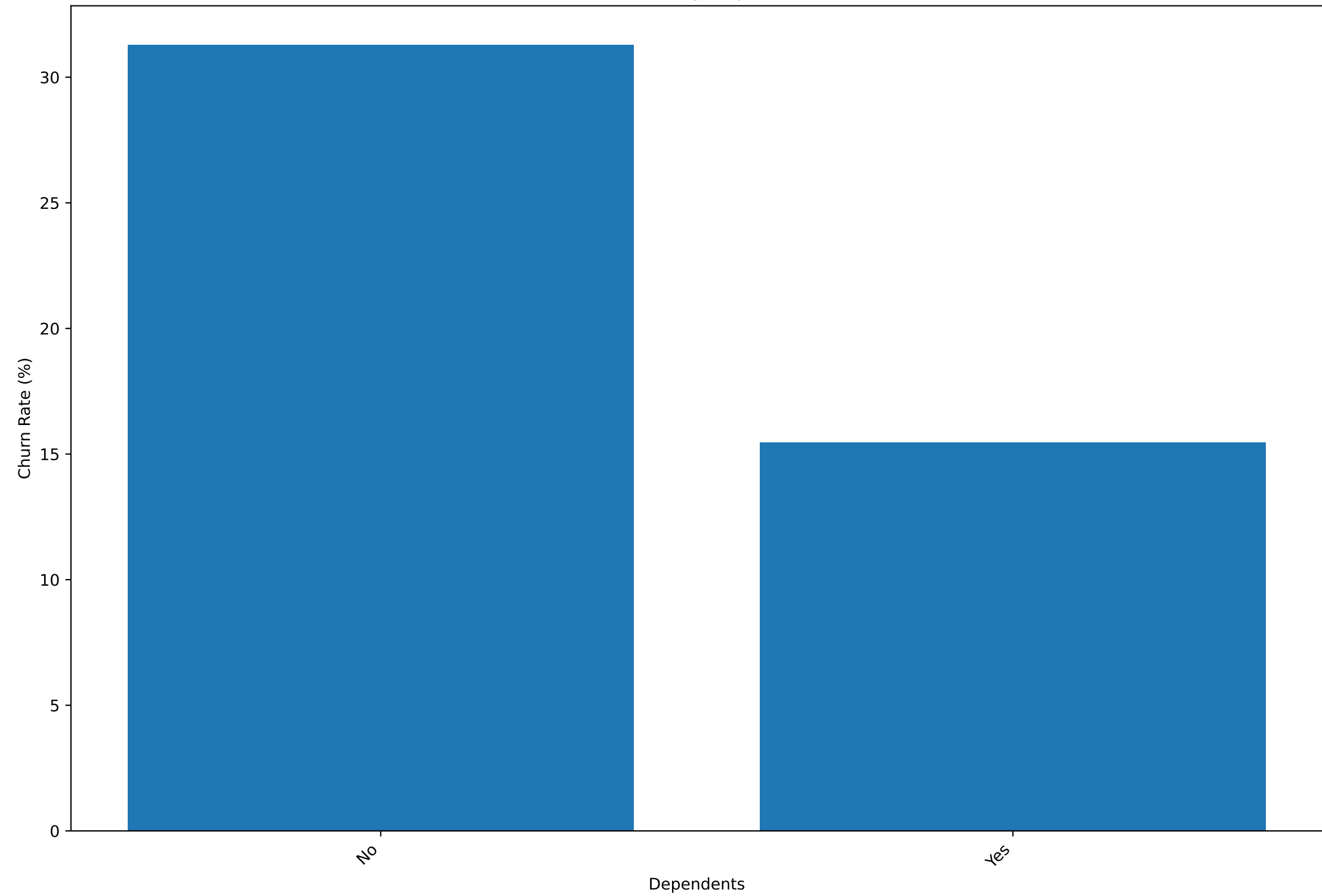
Churn Rate by Partner



## Churn Rate by Partner (counts + %) (page 1/1)

Partner	count	churn_rate_percent
No	3641	32.95797857731392
Yes	3402	19.66490299823633

Churn Rate by Dependents

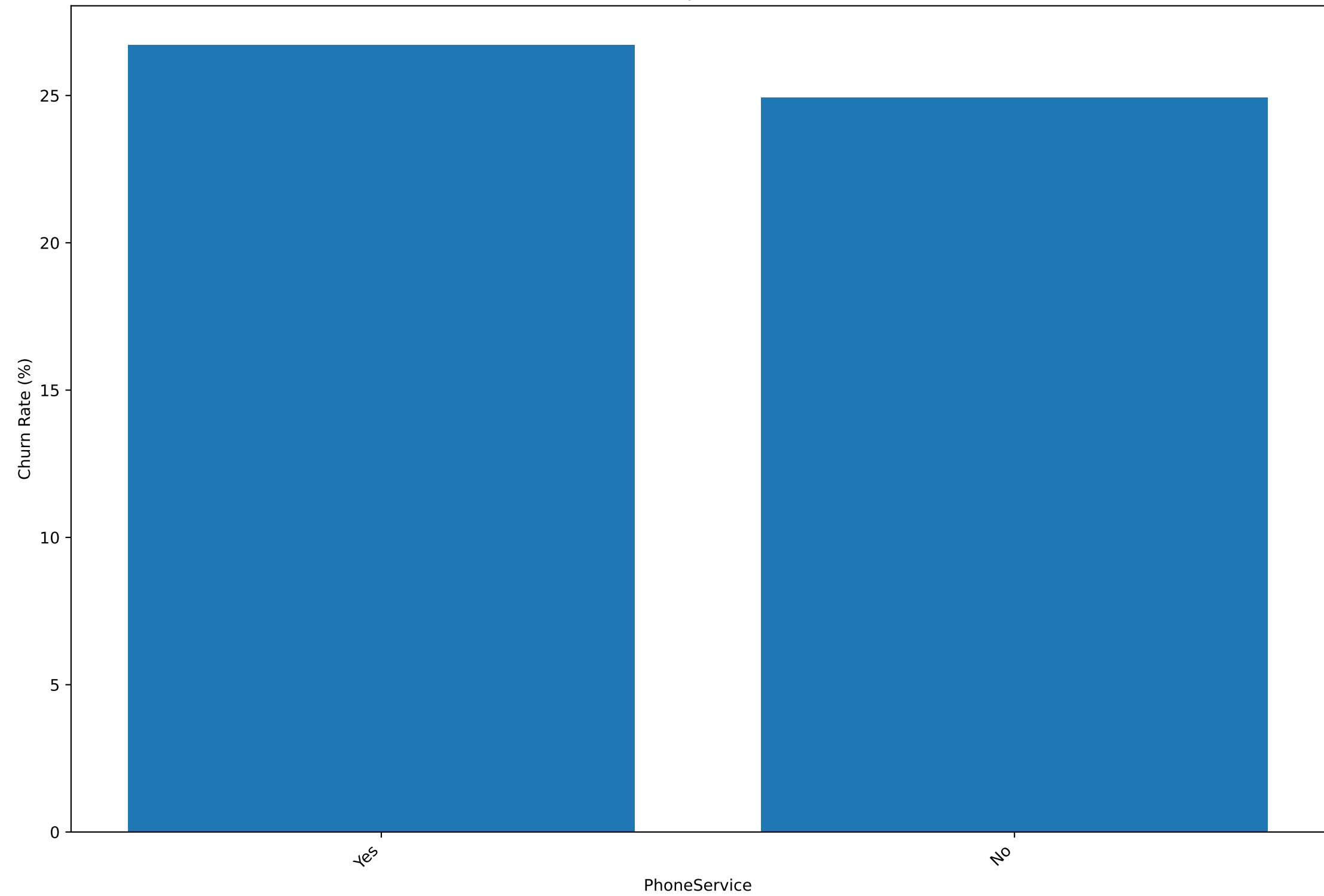




Churn Rate by Dependents (counts + %) (page 1/1)

Dependents	count	churn_rate_percent
No	4933	31.279140482465028
Yes	2110	15.450236966824646

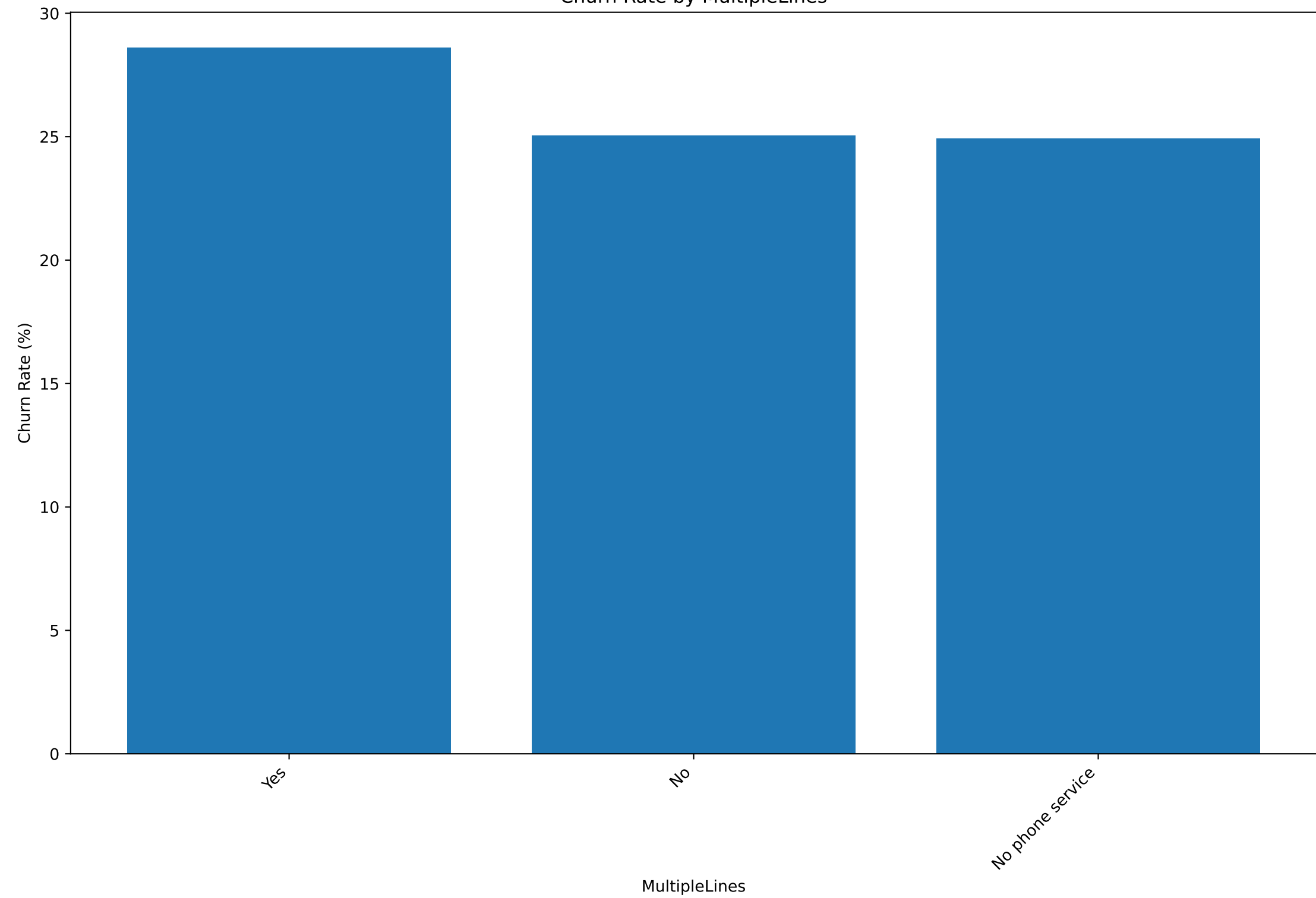
Churn Rate by PhoneService



Churn Rate by PhoneService (counts + %) (page 1/1)

PhoneService	count	churn_rate_percent
Yes	6361	26.70963684955196
No	682	24.926686217008797

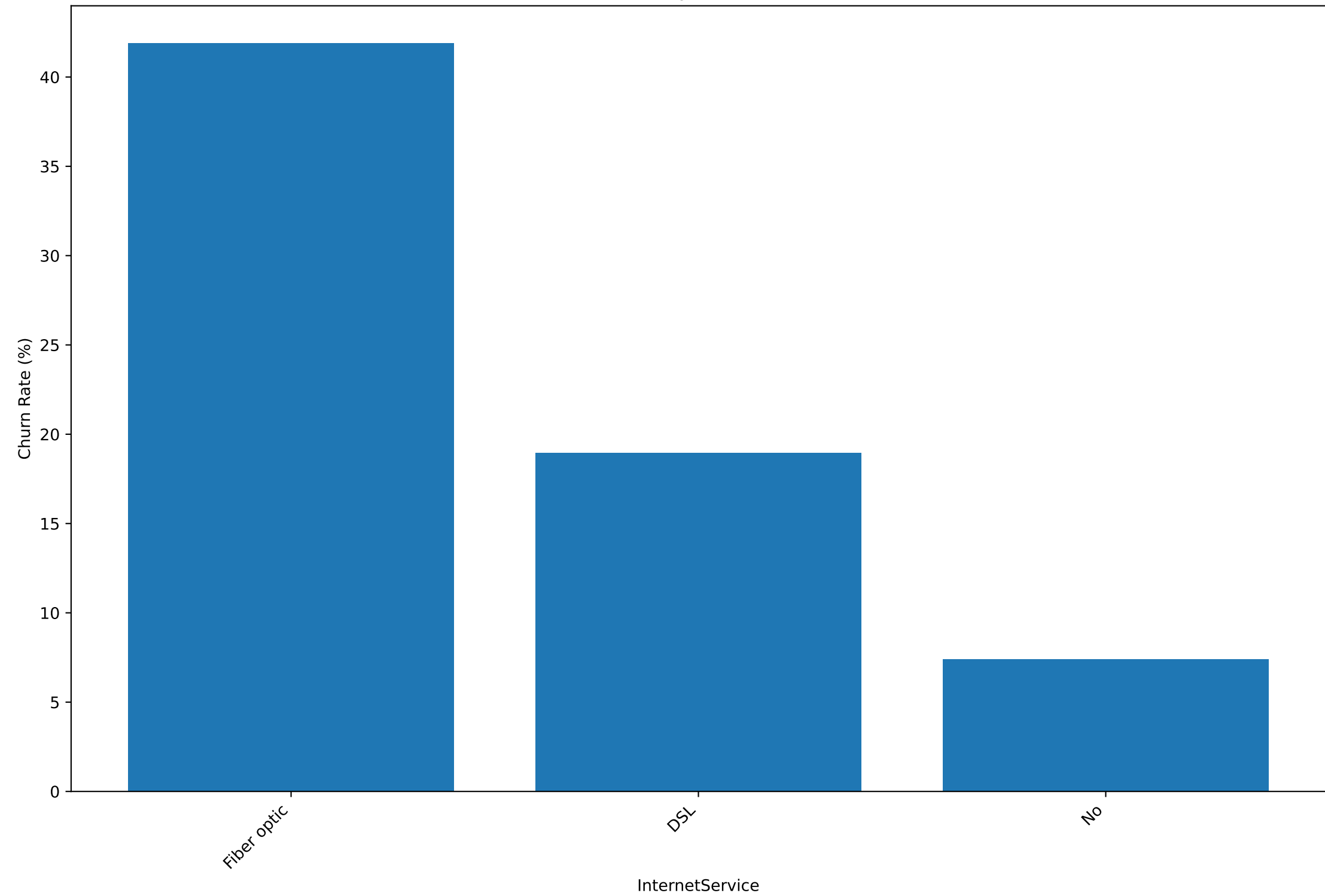
Churn Rate by MultipleLines



Churn Rate by MultipleLines (counts + %) (page 1/1)

MultipleLines	count	churn_rate_percent
Yes	2971	28.6098956580276
No	3390	25.04424778761062
No phone service	682	24.926686217008797

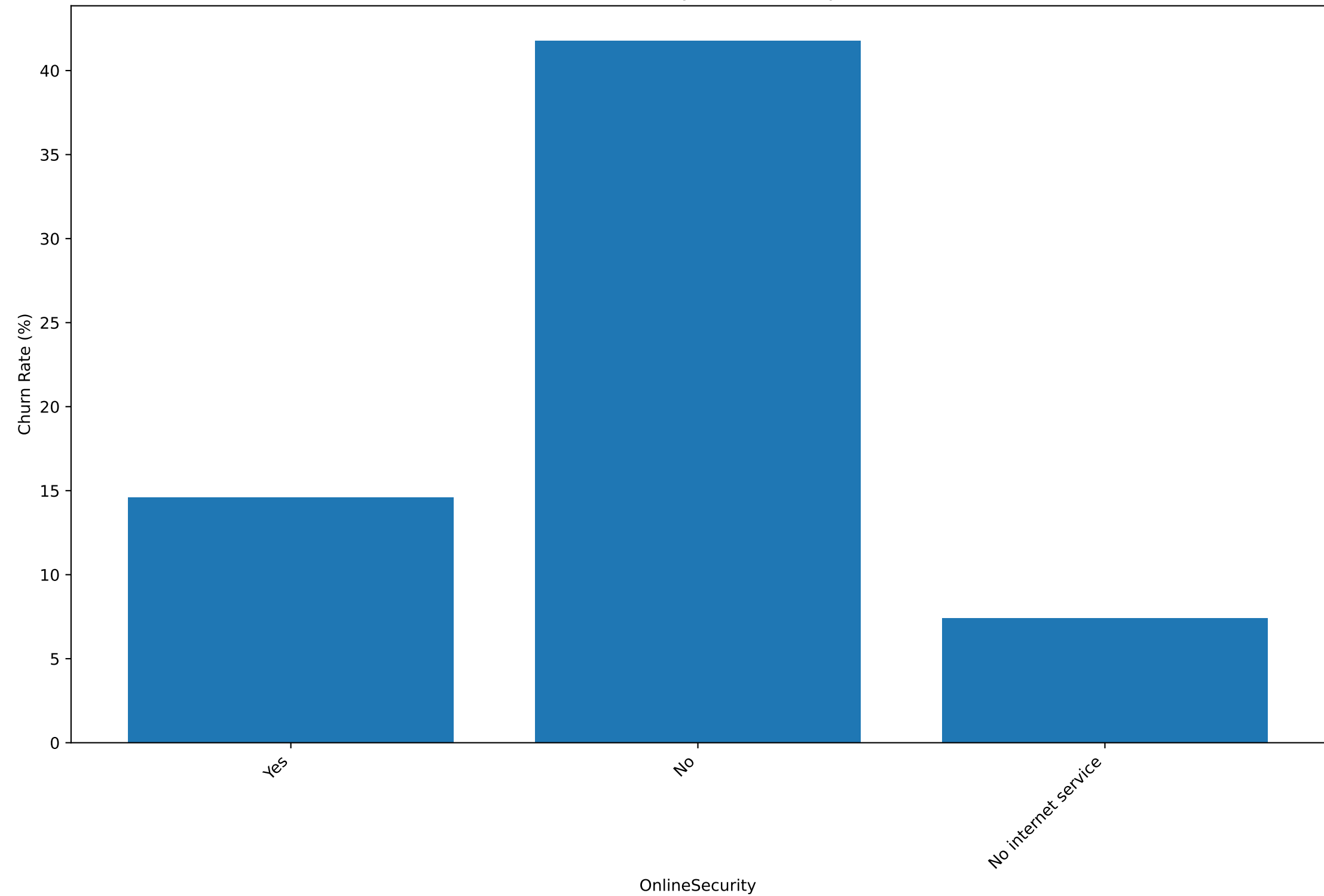
Churn Rate by InternetService



## Churn Rate by InternetService (counts + %) (page 1/1)

InternetService	count	churn_rate_percent
Fiber optic	3096	41.89276485788114
DSL	2421	18.95910780669145
No	1526	7.404980340760157

Churn Rate by OnlineSecurity

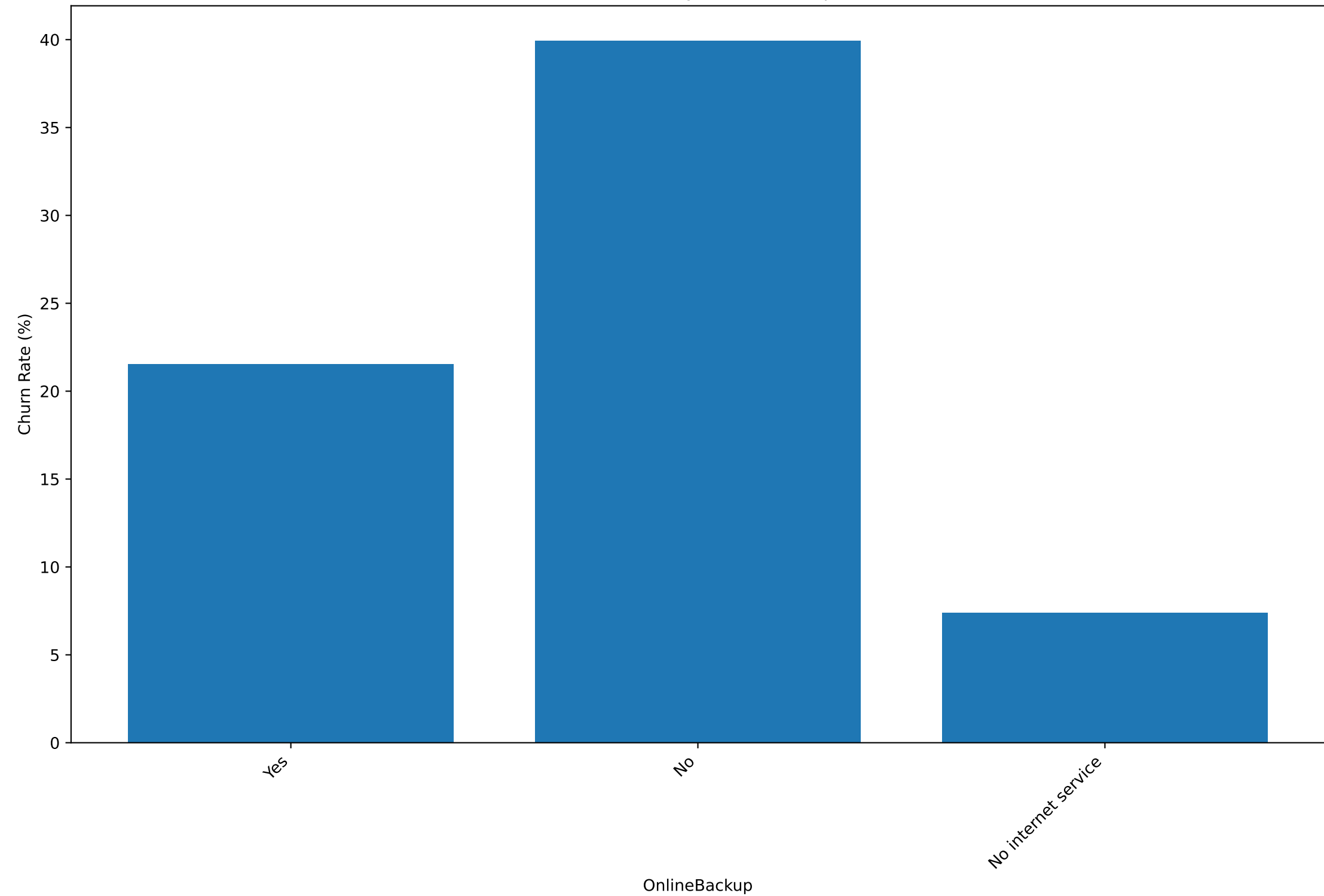




Churn Rate by OnlineSecurity (counts + %) (page 1/1)

OnlineSecurity	count	churn_rate_percent
Yes	2019	14.611193660227837
No	3498	41.76672384219554
No internet service	1526	7.404980340760157

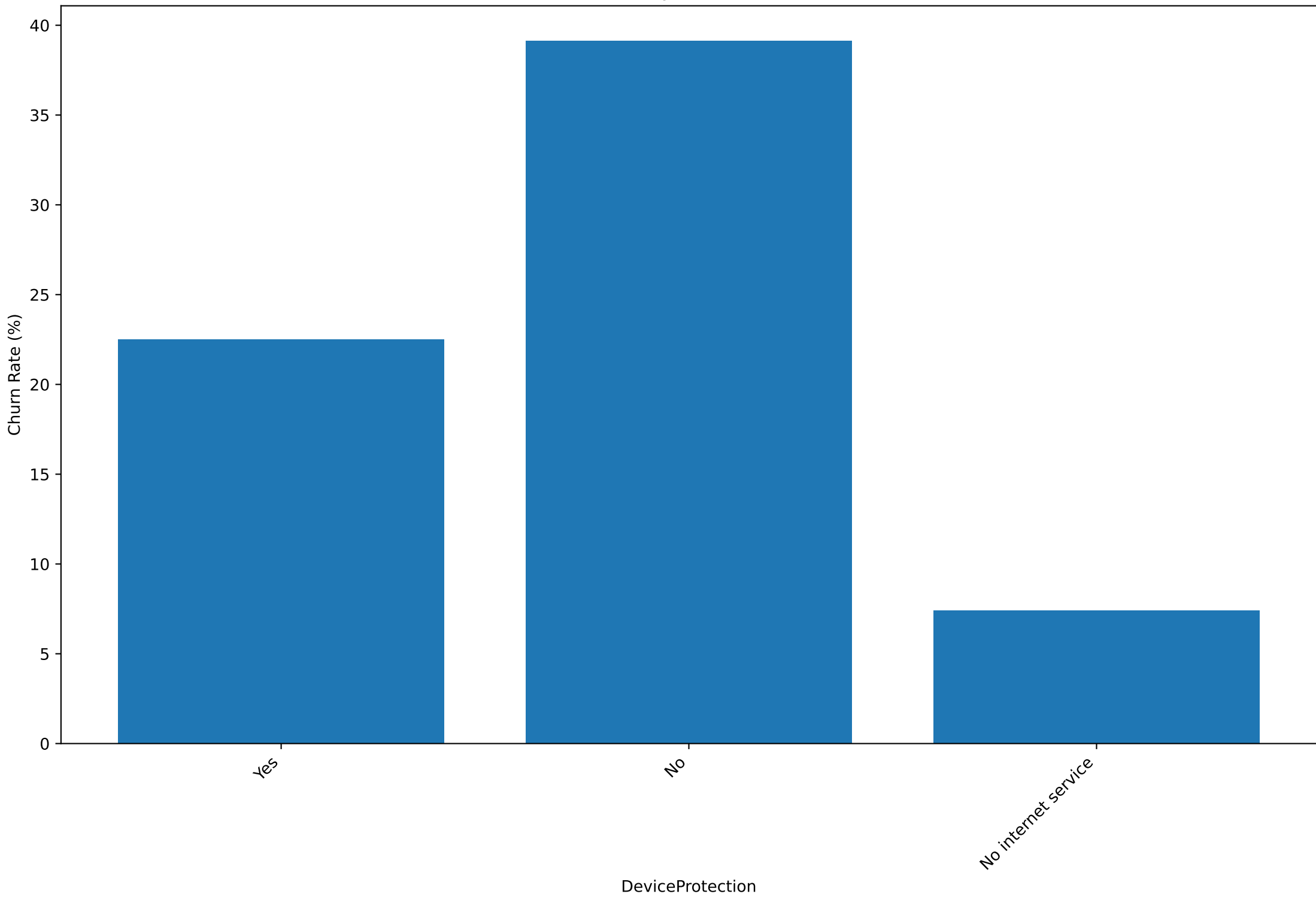
Churn Rate by OnlineBackup



Churn Rate by OnlineBackup (counts + %) (page 1/1)

OnlineBackup	count	churn_rate_percent
Yes	2429	21.531494442157268
No	3088	39.92875647668394
No internet service	1526	7.404980340760157

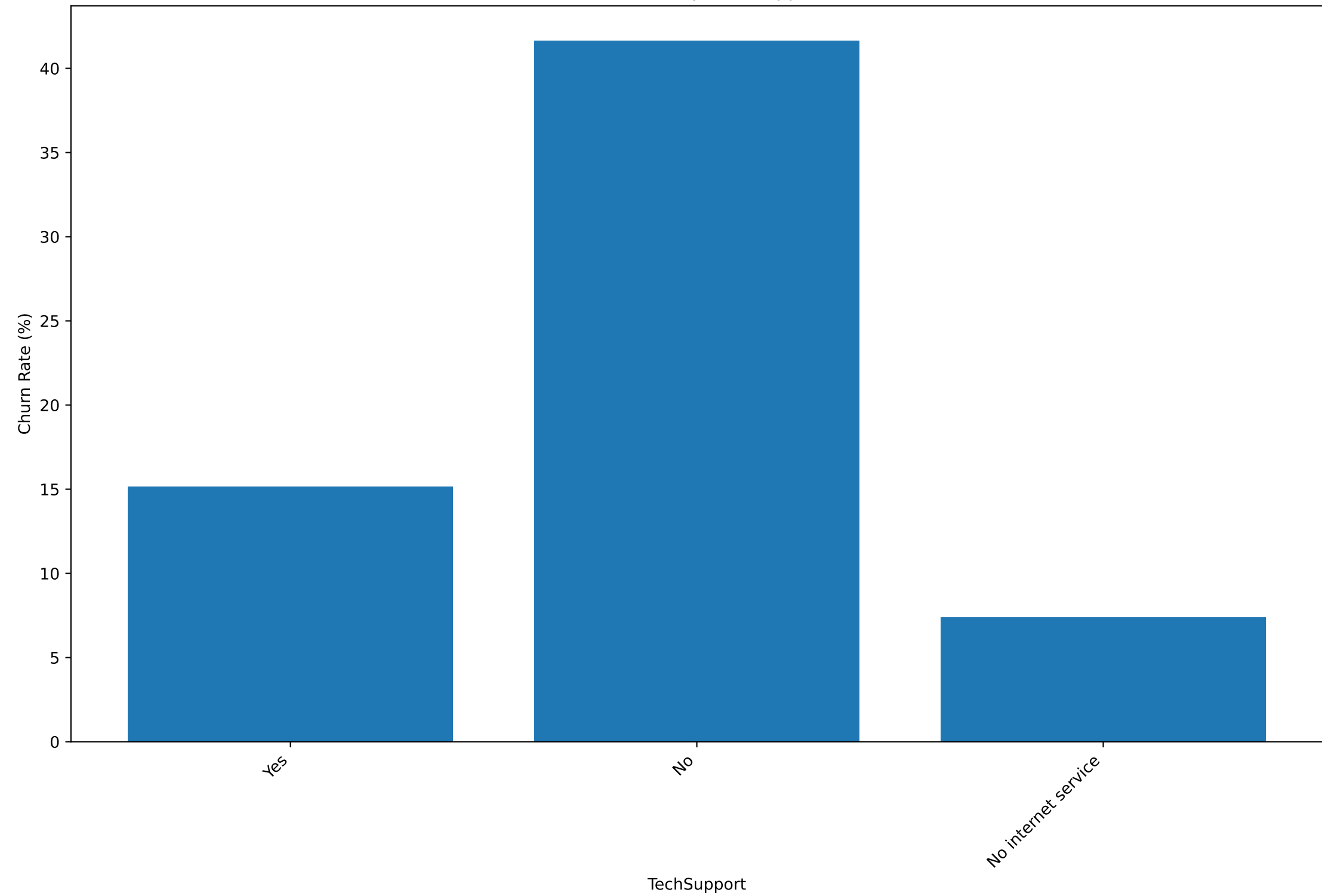
Churn Rate by DeviceProtection



## Churn Rate by DeviceProtection (counts + %) (page 1/1)

DeviceProtection	count	churn_rate_percent
Yes	2422	22.50206440957886
No	3095	39.127625201938606
No internet service	1526	7.404980340760157

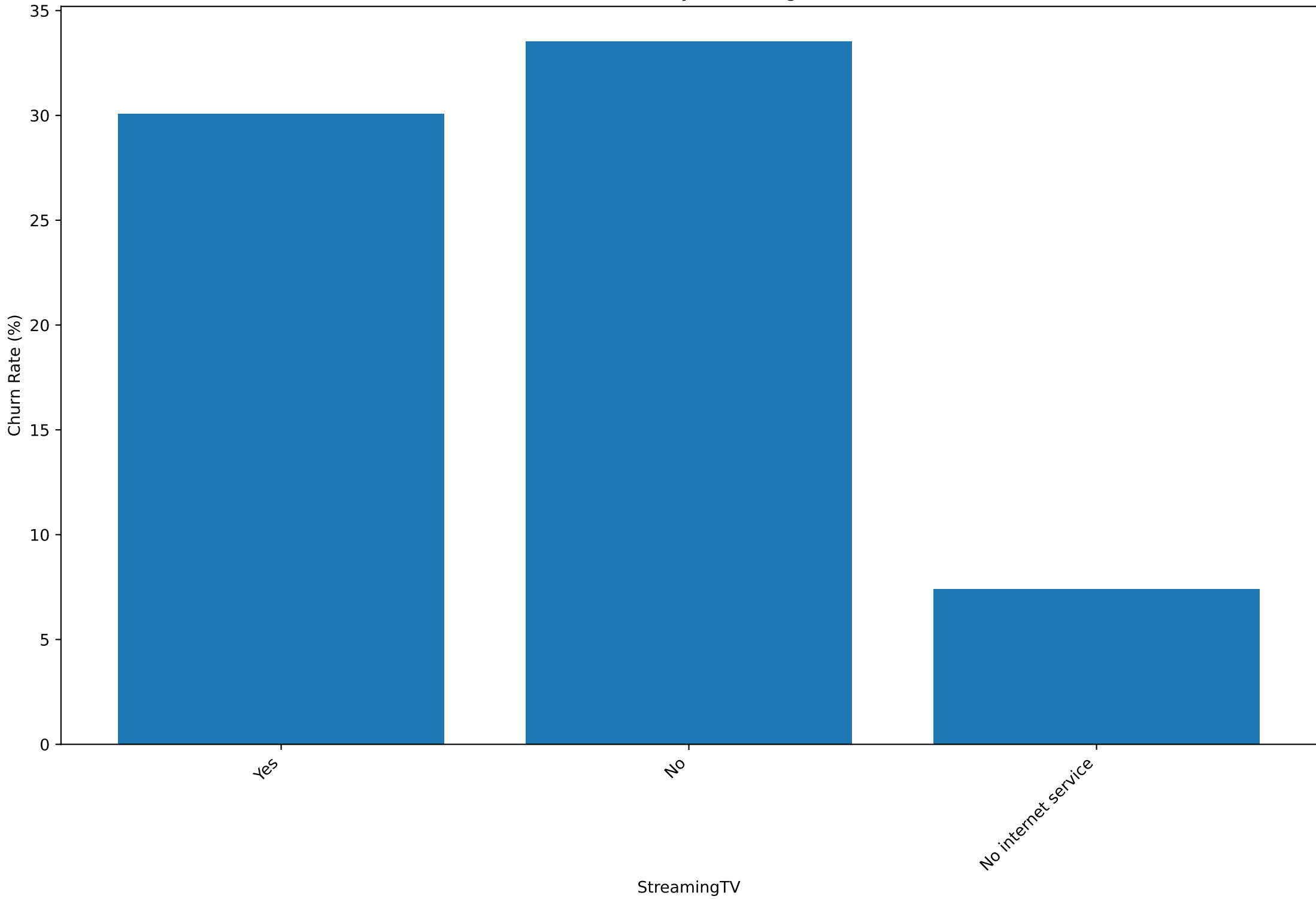
Churn Rate by TechSupport



Churn Rate by TechSupport (counts + %) (page 1/1)

TechSupport	count	churn_rate_percent
Yes	2044	15.166340508806261
No	3473	41.63547365390153
No internet service	1526	7.404980340760157

Churn Rate by StreamingTV

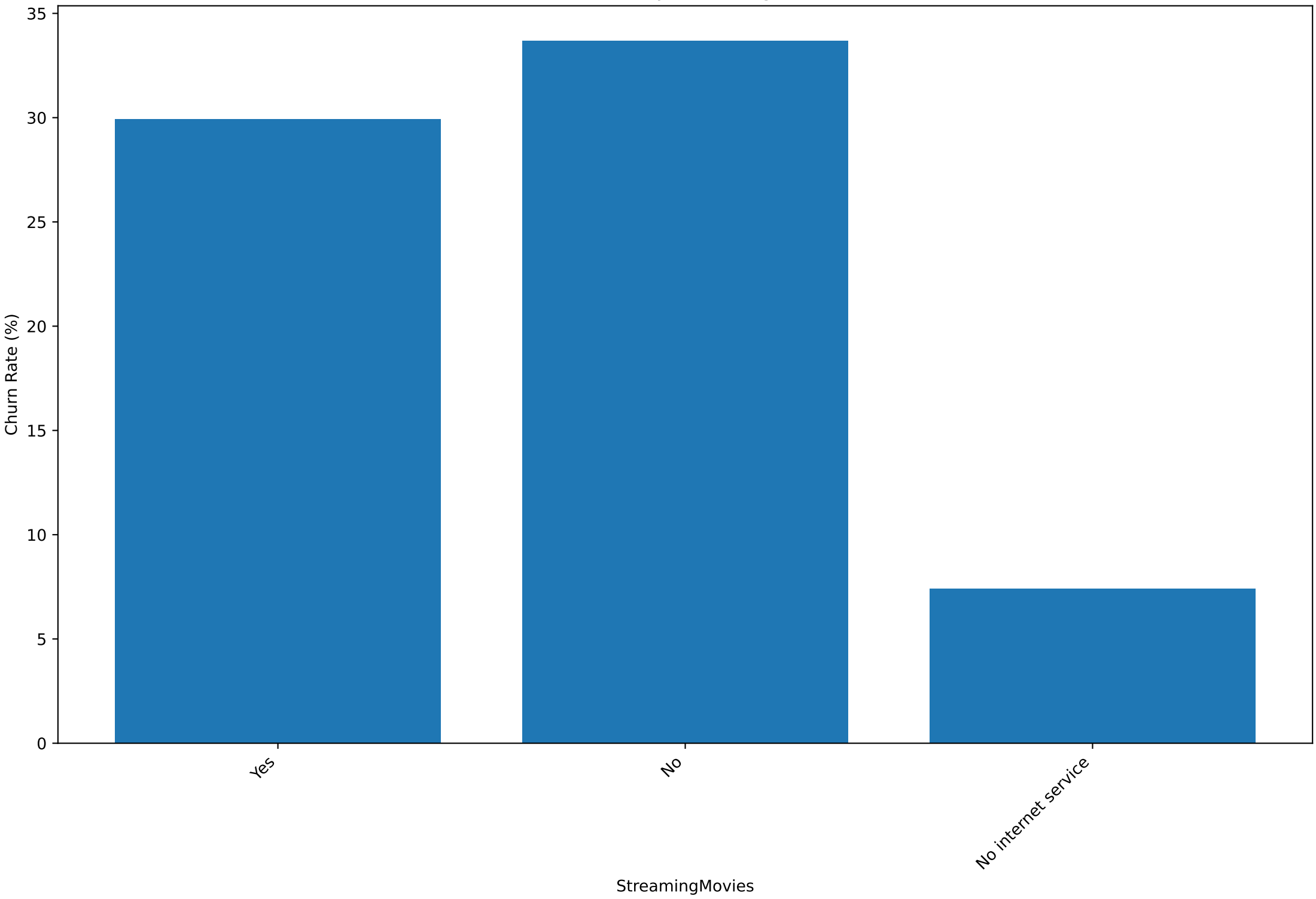




## Churn Rate by StreamingTV (counts + %) (page 1/1)

StreamingTV	count	churn_rate_percent
Yes	2707	30.070188400443293
No	2810	33.52313167259787
No internet service	1526	7.404980340760157

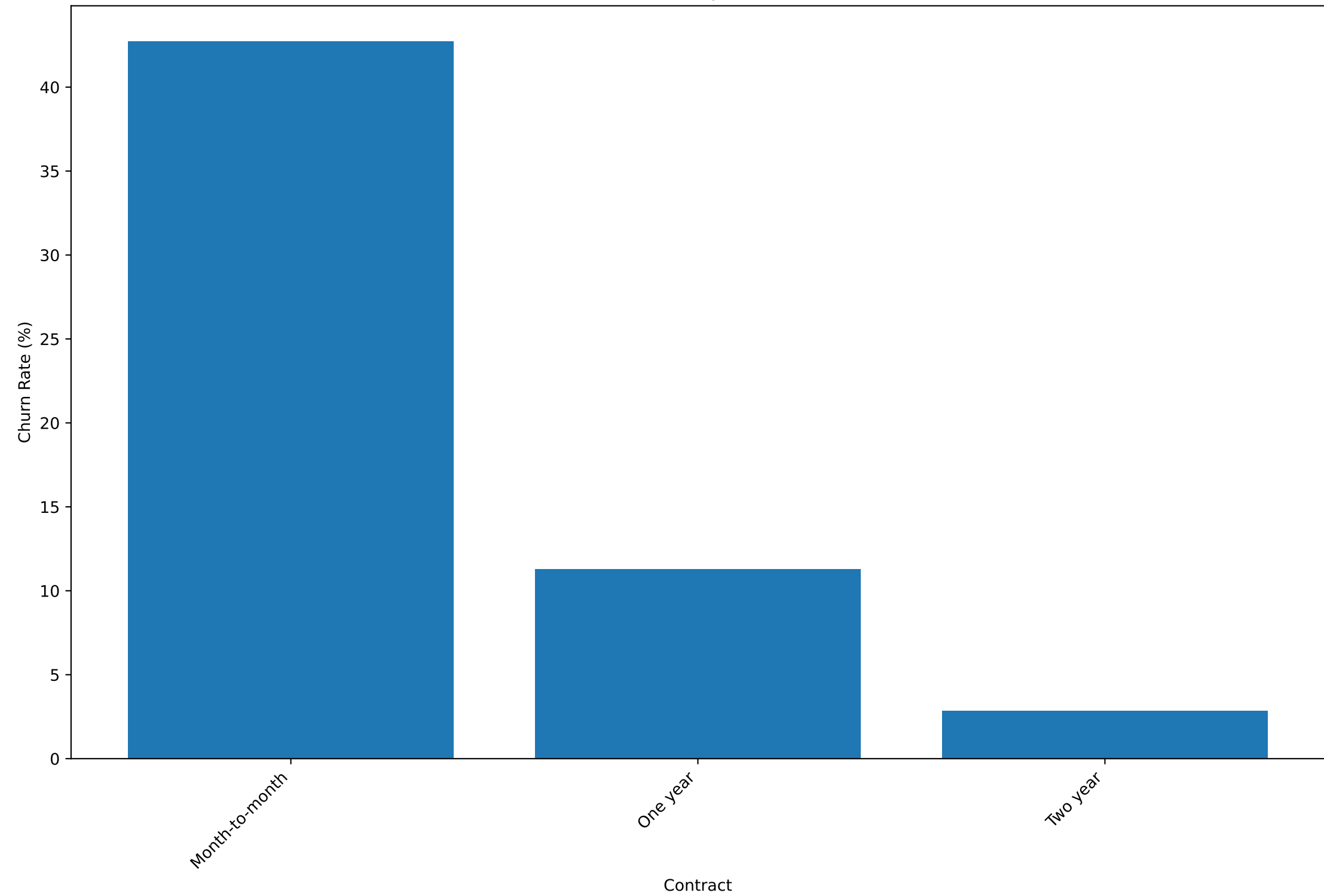
Churn Rate by StreamingMovies



Churn Rate by StreamingMovies (counts + %) (page 1/1)

StreamingMovies	count	churn_rate_percent
Yes	2732	29.941434846266475
No	2785	33.680430879712745
No internet service	1526	7.404980340760157

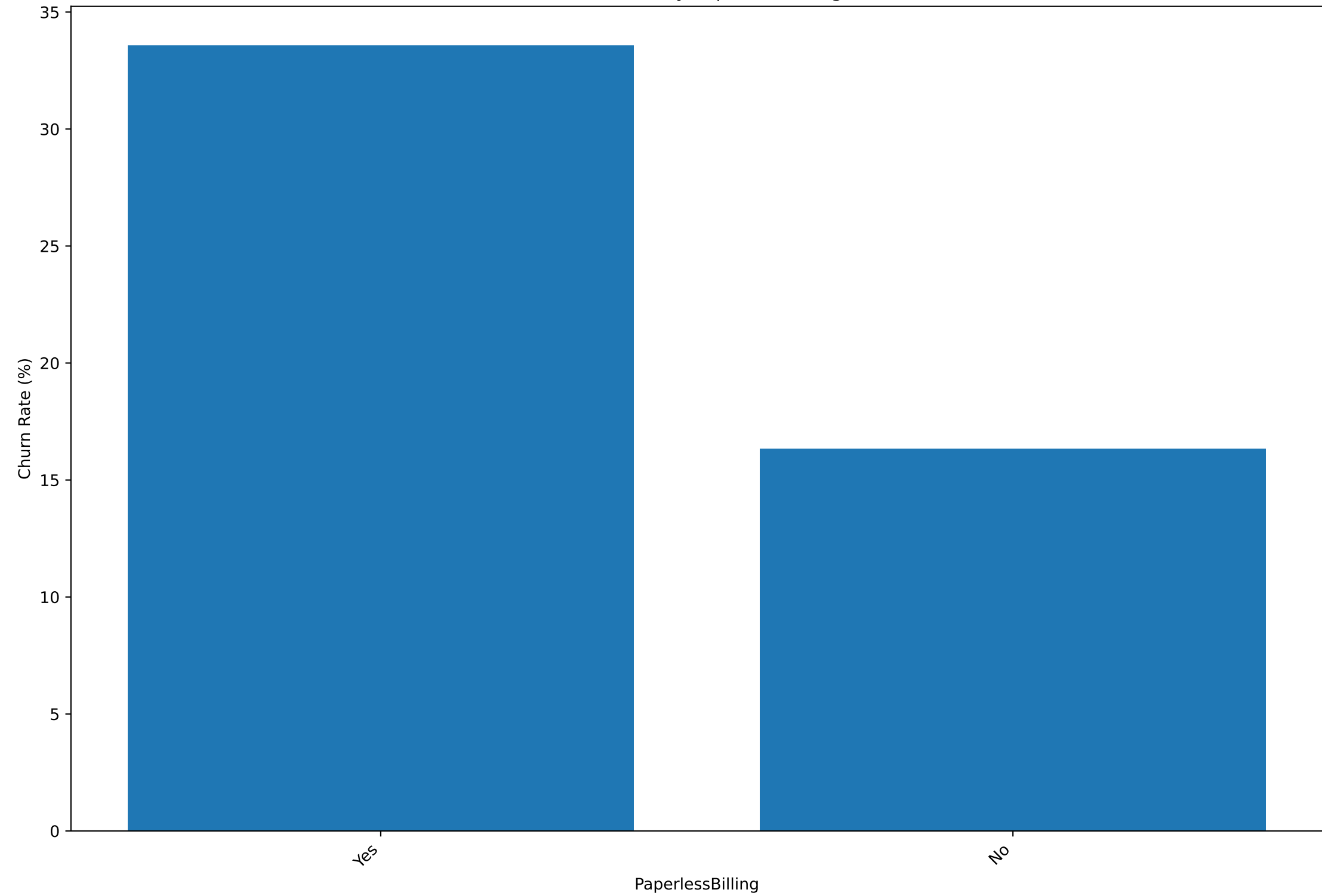
Churn Rate by Contract



## Churn Rate by Contract (counts + %) (page 1/1)

Contract	count	churn_rate_percent
Month-to-month	3875	42.70967741935484
One year	1473	11.269517990495586
Two year	1695	2.831858407079646

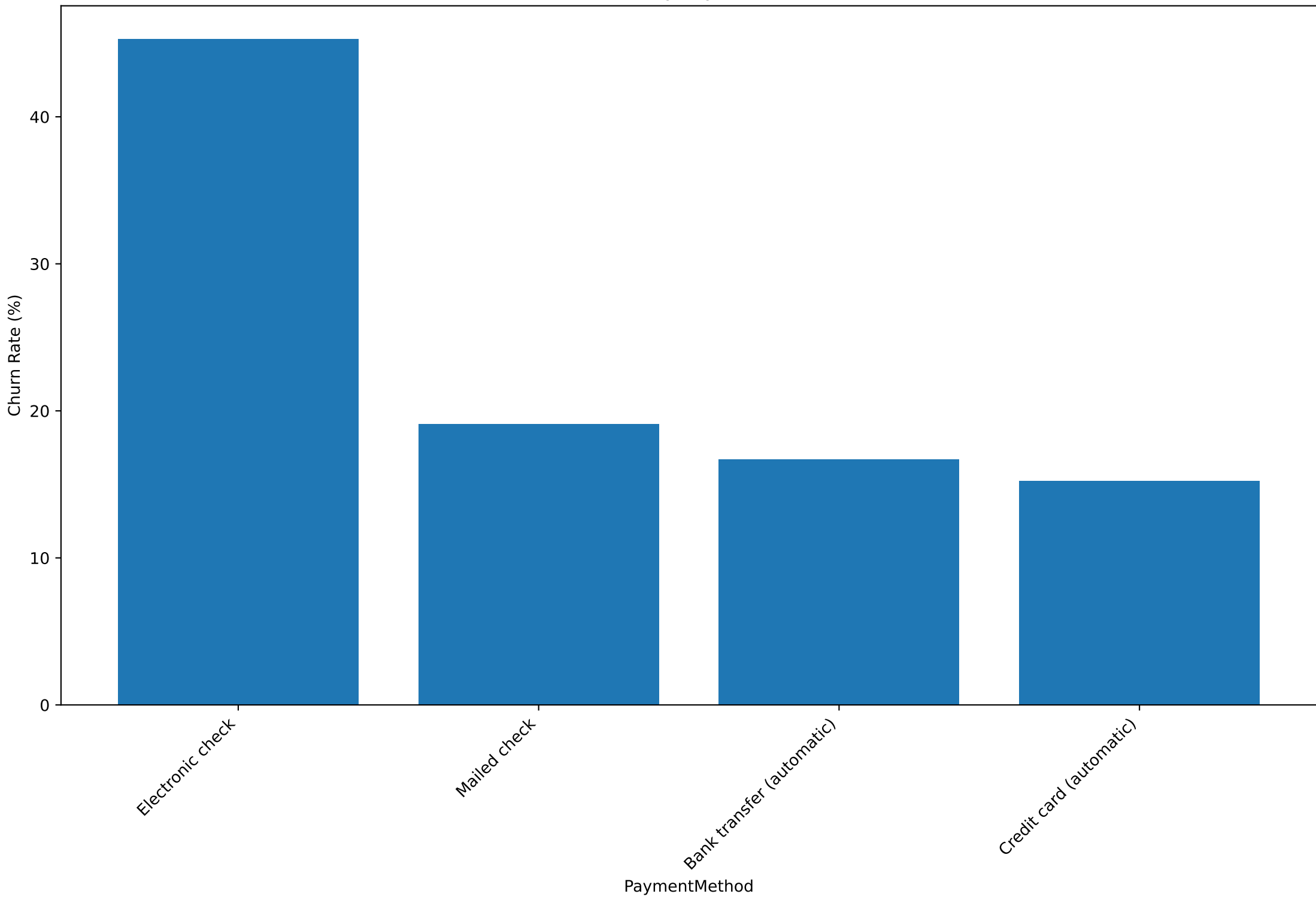
Churn Rate by PaperlessBilling



## Churn Rate by PaperlessBilling (counts + %) (page 1/1)

PaperlessBilling	count	churn_rate_percent
Yes	4171	33.565092304003834
No	2872	16.33008356545961

Churn Rate by PaymentMethod

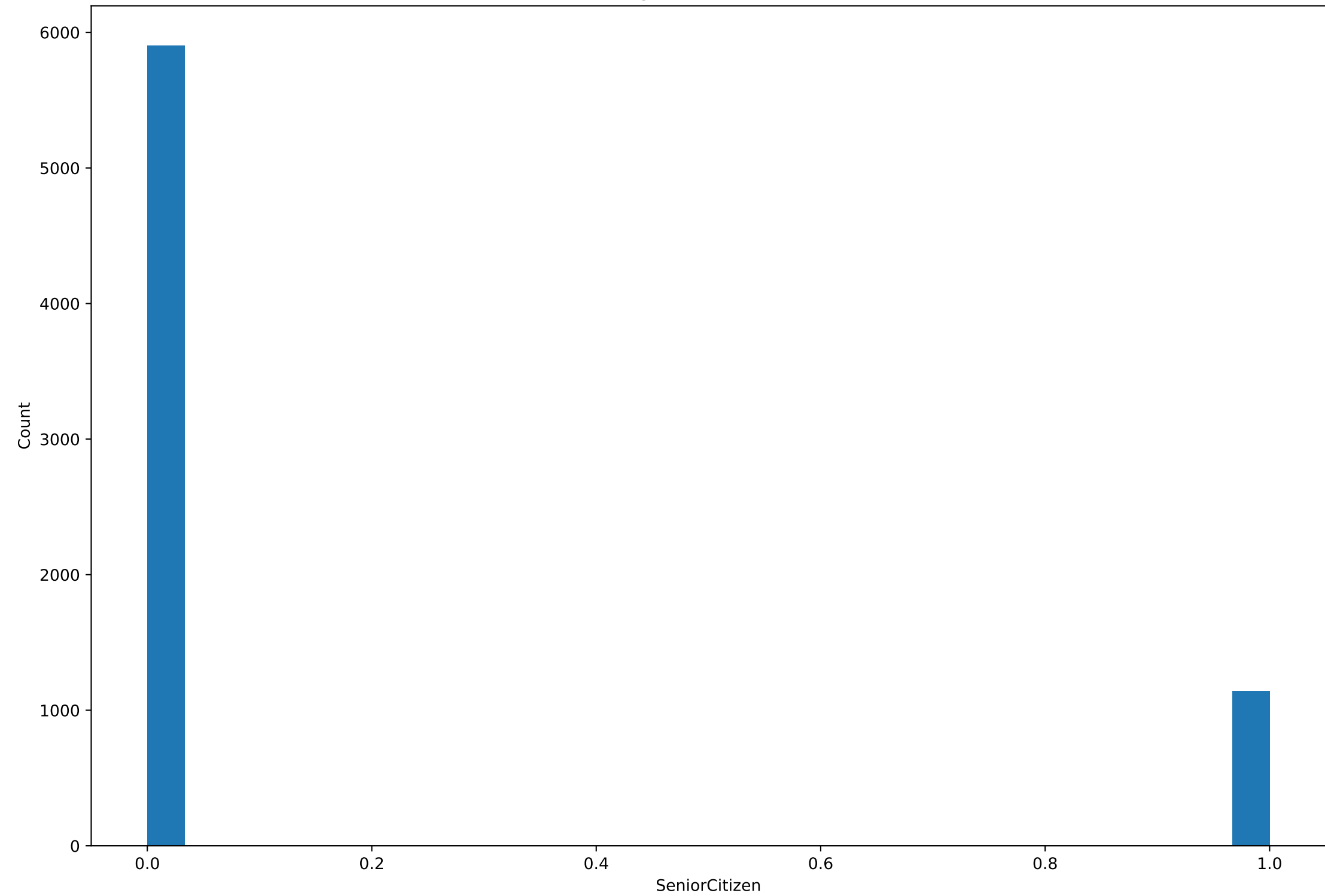




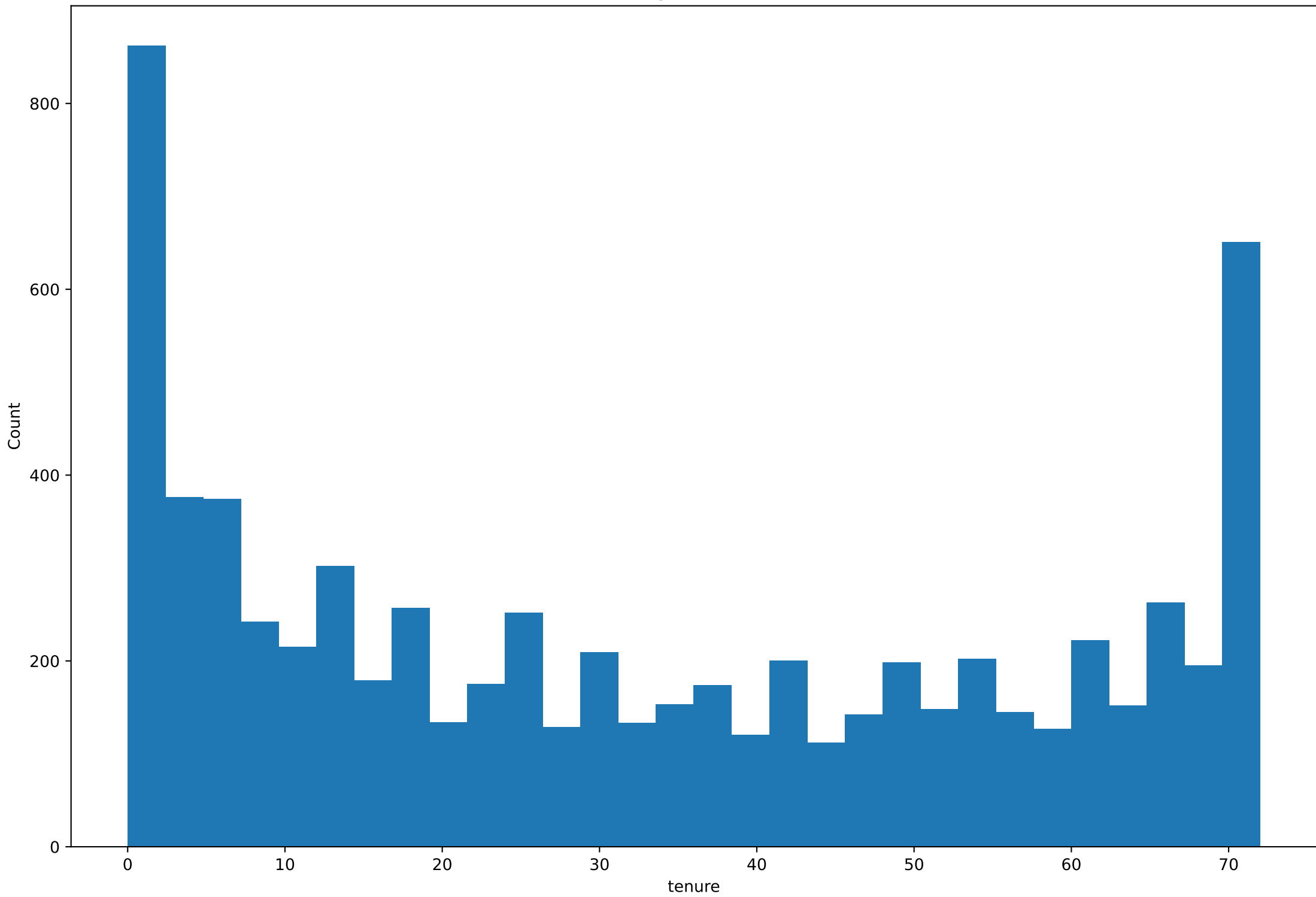
Churn Rate by PaymentMethod (counts + %) (page 1/1)

PaymentMethod	count	churn_rate_percent
Electronic check	2365	45.28541226215645
Mailed check	1612	19.106699751861044
Bank transfer (automatic)	1544	16.709844559585495
Credit card (automatic)	1522	15.243101182654403

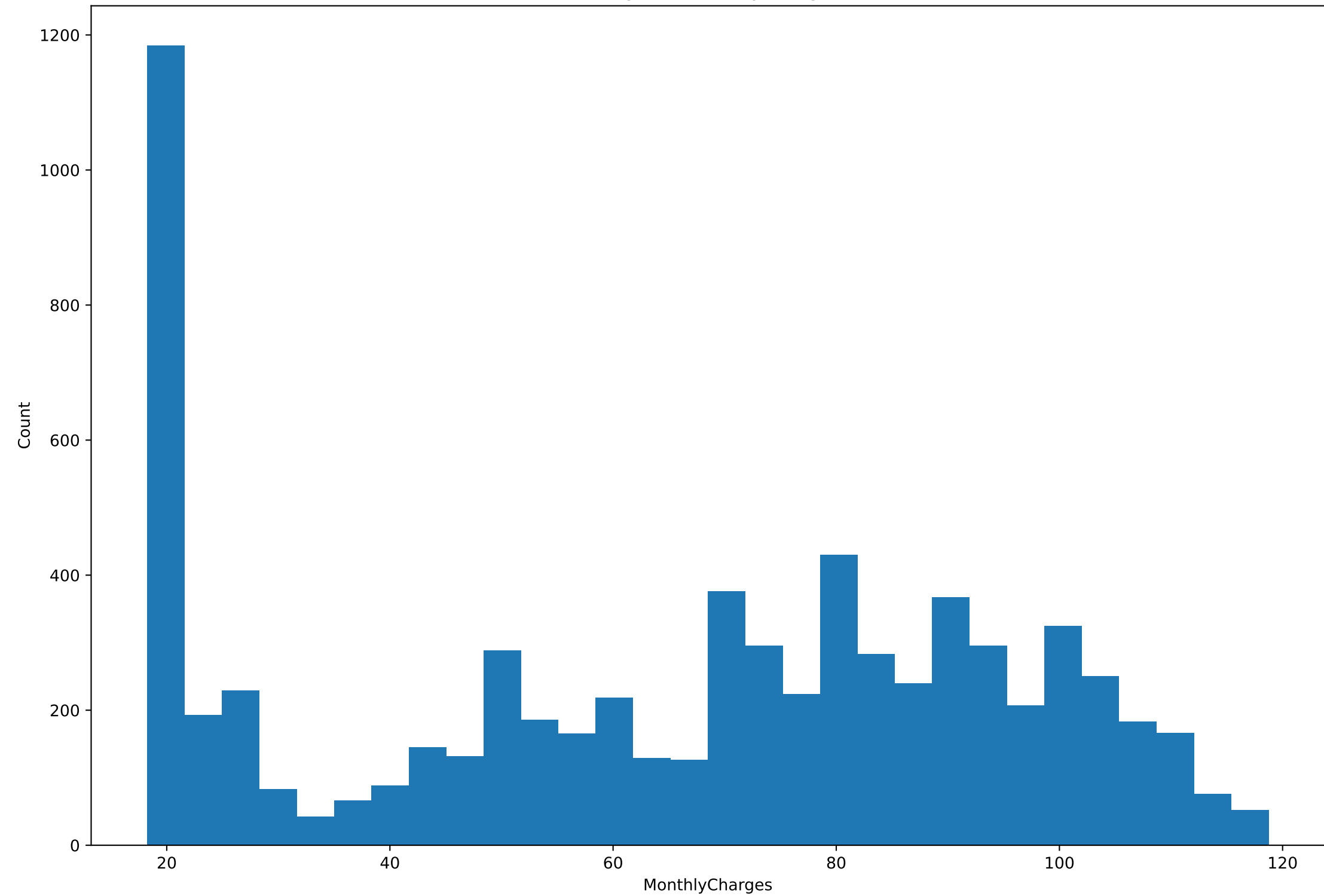
Histogram: SeniorCitizen



Histogram: tenure



Histogram: MonthlyCharges



Numeric Summary (describe + percentiles) (page 1/1)

column	count	mean	std	min	1%	5%	p25	median	p75	95%	99%	max
SeniorCitizen	7043.0	0.1621468124	0.3686116056	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0
tenure	7043.0	32.371148658	24.559481023	0.0	1.0	1.0	9.0	29.0	55.0	72.0	72.0	72.0
MonthlyCharg	7043.0	64.761692466	30.090047097	18.25	19.2	19.65	35.5	70.35	89.85	107.4	114.729	118.75