

EXPLORATORY DATA ANALYSIS (with SLQ)

1. Top 10 de los condados con menor tasa de aprobación

	county_name	Total_de_solicitudes	solicitudes_aproba...	solicitudes_denega...	tasa_aprobacion
1	Ferry County	250	118	132	47.20000076293945
2	Wahkiakum County	277	151	126	54.5099983215332
3	Klickitat County	959	532	427	55.470001220703125
4	Lincoln County	530	297	233	56.040000915527344
5	Adams County	615	346	269	56.2599983215332
6	Okanogan County	1362	779	583	57.20000076293945
7	Yakima County	9750	5688	4062	58.34000015258789
8	Pacific County	1217	711	506	58.41999816894531
9	Lewis County	3954	2314	1640	58.52000045776367
10	San Juan County	982	578	404	58.86000061035156

· Los condados con menor tasa de aprobación deberían ser revisados en función de su demanda para intentar satisfacer mejor las necesidades del mercado.

Código usado:

```
select county_name,
count(sequence_number) as Total_de_solicitudes,
count(case when action_taken_name in ('Loan originated', 'Loan purchased by the institution') then 1 end) as solicitudes_aprobadas,
count(sequence_number) - count(case when action_taken_name in ('Loan originated', 'Loan purchased by the institution') then 1 end)
as solicitudes_denegadas,
cast(count(case when action_taken_name in ('Loan originated', 'Loan purchased by the institution') then 1 end) as float)/
nullif(count(sequence_number), 0) * 100 as tasa_aprobacion,

from Prestamos
where county_name is not null
group by county_name
order by tasa_aprobacion asc
limit 10
```

2. Condados de más a menos media de la cantidad del préstamo mayor y su relación con el ingreso medio anual de los solicitantes de cada condado

	county_name	media_monto_pres...	media_ingreso_anual
1	King County	412.79	147.18
2	San Juan County	359.07	166.51
3	Snohomish County	320.88	109.38
4	Whatcom County	284.07	102.43
5	Kitsap County	273.15	105.84
6	Island County	273.1	105.62
7	Kittitas County	262.91	124.71
8	Skagit County	261.43	95.08
9	Pierce County	261.2	98.4
10	Chelan County	253.57	119.35
11	Clark County	250.98	98.81
12	Thurston County	243.98	94.91
13	Jefferson County	237.63	103.02
14	Skamania County	228.19	92.63
15	Douglas County	220.82	94.07
16	Mason County	215.66	91.94
17	Klickitat County	211.65	99.14
18	Walla Walla County	203.04	89.1
19	Benton County	199.86	90.86
20	Clallam County	199.82	82.84
21	Lewis County	198.79	75.57
22	Spokane County	189.05	86.58
23	Cowlitz County	188.93	80.39
24	Wahkiakum County	187.36	76.01
25	Asotin County	185.47	76.09
26	Whitman County	184.57	94.02
27	Stevens County	183.65	81.74
28	Franklin County	180.91	76.07
29	Grant County	173.82	84.7
30	Okanogan County	170.38	87.09
31	Pend Oreille County	169.36	89.41
32	Yakima County	166.21	77.64
33	Columbia County	164.58	91.67
34	Grays Harbor County	162.4	86.32
35	Pacific County	154.24	83.29
36	Lincoln County	145.05	80.96
37	Ferry County	145.05	72.1
38	Adams County	137.15	64.56
39	Garfield County	117.57	72.76

Código usado:

```
select county_name,
round(avg(loan_amount_000s),2) as media_monto_prestamo,
round(avg(applicant_income_000s),2) as media_ingreso_anual

from Prestamos
where county_name is not null

group by county_name
order by media_monto_prestamo desc
```

· En esta tabla podemos observar como la cantidad media del préstamo (miles \$) y los ingresos medios anuales de los solicitantes (miles \$) están relacionados, ya que por regla general se observa que cuánto más pequeña es una variable, la otra también disminuye.

3. Razón principal de denegación por estado

	county_name	denial_reason_name_1
1	King County	Debt-to-income ratio
2	Lewis County	Collateral
3	Skamania County	Debt-to-income ratio
4	Asotin County	Credit history
5	Spokane County	Credit history
6	Skagit County	Debt-to-income ratio
7	Snohomish County	Debt-to-income ratio
8	Garfield County	Credit history
9	Pacific County	Collateral
10	Clallam County	Debt-to-income ratio
11	Grant County	Credit history
12	Grays Harbor County	Credit history
13	Cowlitz County	Credit application incom...
14	Stevens County	Collateral
15	Whatcom County	Debt-to-income ratio
16	Pend Oreille County	Collateral
17	Benton County	Credit history
18	Thurston County	Debt-to-income ratio
19	Kitsap County	Credit application incom...
20	Lincoln County	Debt-to-income ratio
21	Chelan County	Debt-to-income ratio
22	Ferry County	Collateral
23	Clark County	Credit history
24	Mason County	Collateral
25	Okanogan County	Collateral
26	Jefferson County	Collateral
27	Klickitat County	Collateral
28	Whitman County	Credit history
29	Yakima County	Credit history
30	Island County	Debt-to-income ratio
31	San Juan County	Debt-to-income ratio
32	Wahkiakum County	Collateral
33	Adams County	Credit history
34	Columbia County	Collateral
35	Franklin County	Debt-to-income ratio
36	Douglas County	Debt-to-income ratio
37	Walla Walla County	Debt-to-income ratio
38	Pierce County	Credit history
39	Kittitas County	Debt-to-income ratio

Código usado:

```
select
    county_name, denial_reason_name_1
from (
    select
        county_name,
        denial_reason_name_1,
        row_number() over (
            partition by county_name
            order by count(*) desc
        ) as ranking
    from Prestamos
    where action_taken_name = 'Application denied by financial institution'
        and denial_reason_name_1 is not null
        and denial_reason_name_1 <> ''
    group by county_name, denial_reason_name_1
) as sub,
where ranking = 1
and county_name is not null;
```

· Las principales razones de denegación por condado son:

-Debt to income: Relación deuda-ingreso muy alta

-Credit history: Historial crediticio insuficiente o con problemas

-Collateral: Propiedad tomada como garantía insuficiente

4. Tasa de aprobación según la proporción media de población minoritaria en cada condado

	county_name	porcentaje_población_minoritaria	tasa_aprobacion
1	Adams County	63.87	56.260162353515625
2	Franklin County	45.61	64.10142517089844
3	Yakima County	40.88	58.338462829589844
4	Grant County	36.53	62.890953063964844
5	King County	32.39	69.07713317871094
6	Douglas County	28.86	66.1800537109375
7	Chelan County	27.06	64.65249633789062
8	Pierce County	26.94	64.91342163085938
9	Snohomish County	24.4	68.68317413330078
10	Okanogan County	23.74	57.1953010559082
11	Walla Walla County	23.34	65.62078094482422
12	Skagit County	21.81	65.92108917236328
13	Benton County	21.68	66.97792053222656
14	Thurston County	21.15	66.88084411621094
15	Kitsap County	19.42	65.1644515991211
16	Ferry County	18.41	47.20000076293945
17	Whatcom County	17.32	67.84725952148438
18	Clark County	17.25	68.97748565673828
19	Klickitat County	16.7	55.47445297241211
20	Grays Harbor County	15.51	60.104225158691406
21	Island County	14.96	69.48587799072266
22	Mason County	14.52	59.48942947387695
23	Lewis County	13.42	58.52301788330078
24	Whitman County	13.36	63.504154205322266
25	Pacific County	12.85	58.4223518371582
26	Cowlitz County	12.83	62.953887939453125
27	Clallam County	12.42	64.21690368652344
28	Spokane County	12.18	67.40763854980469
29	Kittitas County	11.54	66.20171356201172
30	Columbia County	10.52	59.28571319580078
31	Jefferson County	10.26	61.60567855834961
32	Pend Oreille County	10.14	59.97474670410156
33	Skamania County	9.66	63.26815414428711
34	San Juan County	9.48	58.859466552734375
35	Stevens County	8.62	60.66416931152344
36	Wahkiakum County	7.54	54.512638092041016
37	Garfield County	7.24	61.904762268066406
38	Asotin County	7.14	64.08126068115234
39	Lincoln County	6.46	56.03773498535156

· Podemos observar mediante la tabla que no hay relación entre la tasa de aprobación y el porcentaje medio de población minoritaria de cada condado.

Código usado:

```
select county_name,
round(avg(minority_population),2) as porcentaje_población_minoritaria,
cast(count(case when action_taken_name in ('Loan originated', 'Loan purchased by the institution') then 1 end) as float)/
nullif(count(sequence_number), 0) * 100 as tasa_aprobacion
from Prestamos
where county_name is not null
group by county_name
order by porcentaje_población_minoritaria desc
```

5. Tasa de interés media e ingreso medio anual por familia según el vecindario por condado

	county_name	media_ingreso_x_familia	tasa_de_interés_media
1	Snohomish County	90300	2.11
2	King County	90300	2.24
3	Kitsap County	78100	2.39
4	Thurston County	73600	2.18
5	Clark County	73300	2.12
6	Skamania County	73300	2.09
7	Pierce County	72300	2.02
8	Whatcom County	69900	2.01
9	Franklin County	65800	1.86
10	Benton County	65800	2.01
11	Chelan County	63100	1.86
12	Douglas County	63100	2.01
13	Spokane County	61800	2.2
14	Stevens County	61800	2.27
15	Pend Oreille County	61800	2.62
16	Skagit County	61400	2.05
17	Cowlitz County	61300	2
18	Asotin County	59400	1.98
19	Walla Walla County	57900	2.17
20	Columbia County	57900	2.28
21	Island County	55600	2.35
22	Grays Harbor County	55600	2.04
23	Clallam County	55600	2.74
24	Lewis County	55600	2.19
25	Kittitas County	55600	2.06
26	Lincoln County	55600	2.22
27	San Juan County	55600	1.89
28	Mason County	55600	2
29	Klickitat County	55600	2.12
30	Jefferson County	55600	2.31
31	Grant County	55600	2.05
32	Okanogan County	55600	1.94
33	Pacific County	55600	1.99
34	Whitman County	55600	2.09
35	Garfield County	55600	1.78
36	Adams County	55600	1.78
37	Ferry County	55600	1.67
38	Wahkiakum County	55600	1.78
39	Yakima County	48700	1.97

Código usado:

```
select
county_name,
round(avg(hud_median_family_income),2) as media_ingreso_x_familia,
round(avg(rate_spread),2) as tasa_de_interés_media
from Prestamos
where county_name is not null
group by county_name
order by media_ingreso_x_familia desc
```

· Se observa que independientemente del ingreso medio de las familias de cada condado la tasa de interés media ronda entorno al 1.8% y 2.5%