INSURANCE DATABASE SQL PORTFOLIO

1. Project Overview

Project Name: Insurance Claims & Policies Analysis

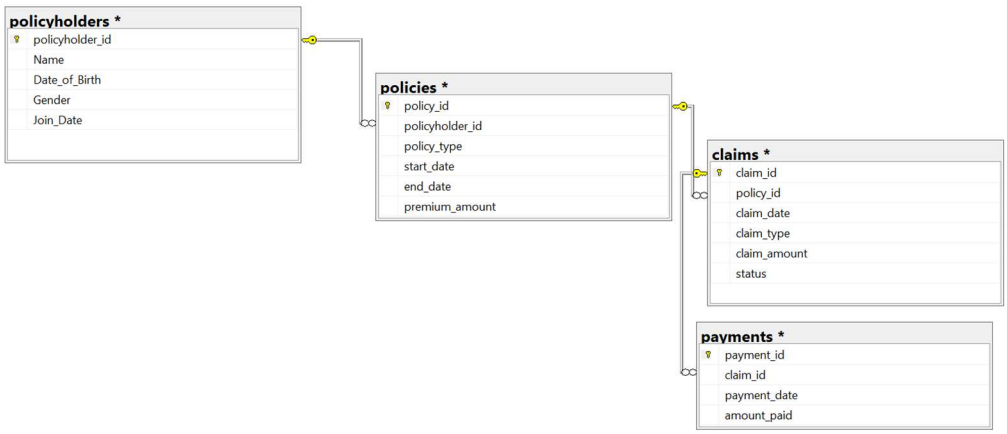
Purpose : Demonstrate SQL skills using a realistic insurance database.

Tools used: SQL, WORD AND POWER BI

Tables

- ★ **Policyholders**
- ★ **Policies**
- ★ **Claims**
- ★ **Payments**

Relationships between the tables



2. View Data

```
-- Check the tables

Select TOP(10)* from dbo.claims;
Select top(10)* from dbo.policies;
Select top(10)* from dbo.payments;
Select top(10)* from dbo.policyholders;
```

	claim_id	policy_id	claim_date	claim_type	claim_amount	status
1	1	32	2013-06-19	Accident	16048.19	Rejected
2	2	78	2006-04-04	Accident	33914.97	Approved
3	3	74	2024-10-21	Accident	42407.10	Rejected
4	4	8	2010-12-12	Accident	9823.32	Rejected
5	5	75	2014-12-31	Accident	34614.22	Pending
6	6	60	1994-03-03	Medical	12879.99	Rejected
7	7	19	2004-08-01	Medical	20082.88	Approved
8	8	54	2025-07-26	Medical	25618.50	Pending
9	9	80	2019-11-25	Accident	10812.55	Rejected
10	10	1	2008-11-15	Theft	20814.57	Approved

	policy_id	policyholder_id	policy_type	start_date	end_date	premium_amount
1	1	47	Motor	2004-06-25	2006-05-22	12727.65
2	2	22	Health	1992-10-03	1997-01-27	11144.61
3	3	24	Motor	2013-11-11	2017-01-10	17006.75
4	4	36	Property	2025-05-28	2030-02-15	17589.76
5	5	17	Motor	2015-07-18	2017-04-08	5701.62
6	6	43	Motor	2017-03-10	2020-09-17	9157.84
7	7	19	Property	2008-07-15	2011-07-25	9861.05
8	8	41	Property	2007-12-23	2011-10-08	15151.16
9	9	12	Health	2023-03-08	2025-05-05	8106.92
10	10	18	Motor	2009-06-03	2012-04-17	13645.33

	payment_id	claim_id	payment_date	amount_paid
1	1	2	2006-07-31	15975.27
2	2	2	2006-05-02	7944.01
3	3	3	2006-05-12	9995.69
4	4	7	2004-10-02	20082.88
5	5	10	2009-03-31	9489.08
6	6	10	2008-12-02	11325.49
7	7	11	2024-09-18	22507.35
8	8	13	2024-12-17	7812.32
9	9	13	2024-10-13	9859.14
10	10	13	2024-12-27	9517.03

Click to select the whole row

	policyholder_id	Name	Date_of_Birth	Gender	Join_Date
3	3	Denise Pal...	1993/08/05	Male	2023/11/19
4	4	Ryan Horne	1975/05/03	Male	2001/01/29
5	5	Jonathan A...	1998/01/01	Female	2019/04/17
6	6	Kerry Molina	1966/09/02	Male	1994/02/18
7	7	Michelle G...	1970/03/15	Male	1994/08/24
8	8	Michael Hall	1994/07/09	Female	2020/06/24
9	9	Amy Avila	1983/04/09	Female	2010/10/22
10	10	Michael Ed...	1979/02/24	Male	2000/05/24

3. Views and Procedures

```
--2.
Select claim_id, claim_type,policy_type
from dbo.claims c
join dbo.policies p on c.policy_id=p.policy_id
where not (
(c.claim_type ='Theft' And p.policy_type='Motor')
or (c.claim_type = 'Accident' and p.policy_type in ('Motor', 'Property'))
or (c.claim_type = 'Medical' And p.policy_type = 'Health')
);
```

This analysis checks for mismatches between policy type and claim type. For example, it identifies cases where a claim is categorised as "Accident" while the policyholder has a Health policy. Detecting such inconsistencies is important to ensure data integrity, prevent incorrect claim processing, and maintain accurate reporting for underwriting and risk assessment.

```
Create view LossRatio As
Select p.policy_type, sum(py.amount_paid)/sum(p.premium_amount) As loss_ratio
from dbo.policies p
join dbo.claims c on p.policy_id=c.policy_id
join dbo.payments py on py.claim_id=c.claim_id
group by p.policy_type;

select * from LossRatio
```

	policy_type	loss_ratio
1	Health	1.030733
2	Motor	0.973877
3	Property	0.859452

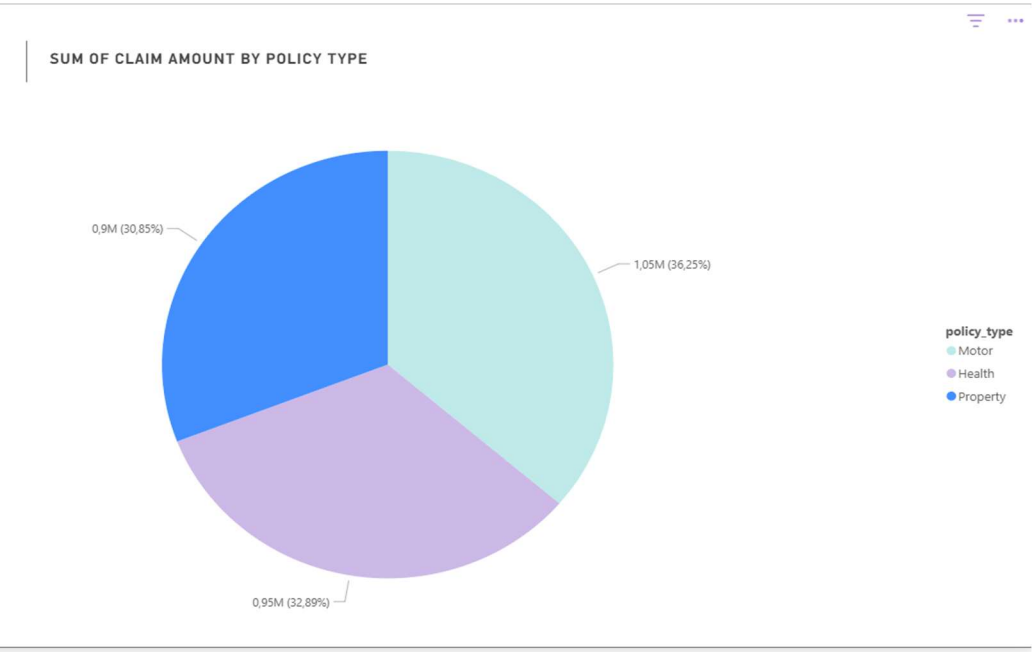
- **For Health, the loss ratio of 1.03 indicates that the company is operating at a loss: for every 1 unit of premium received, it pays out 1.031 units in claims.**
- **For Motor (0.97) and Property (0.86), the company is still able to pay claims, but the premiums earned are just covering or slightly exceeding the claims, leaving little room for expenses or profit.**

Key takeaway: A loss ratio above 1 indicates a loss, while a ratio below 1 shows premiums exceed claims, though profitability also relies on operational expenses.

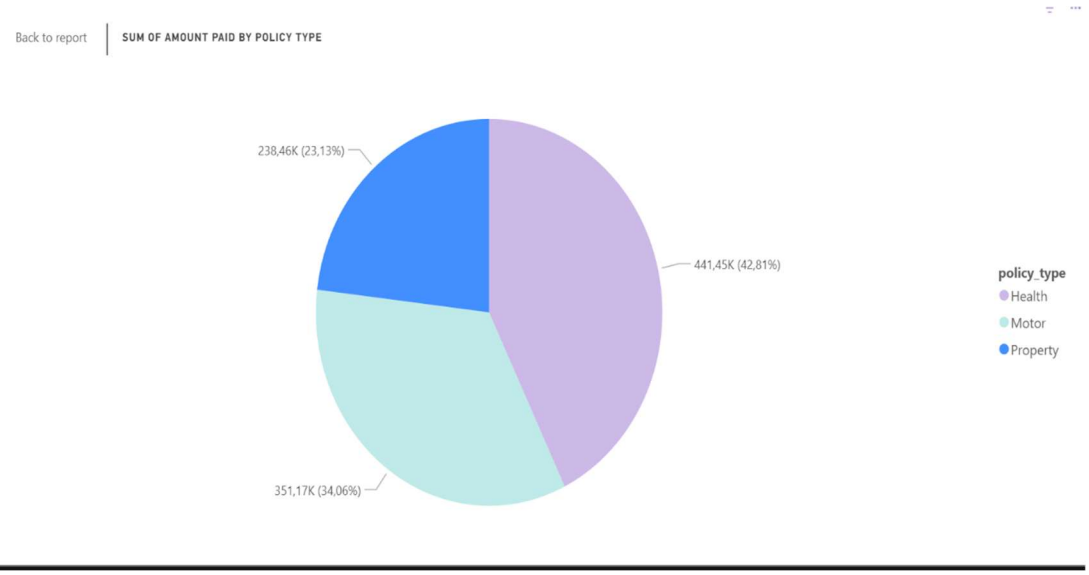
```sql
create procedure GetTopClaimants( @top INT)
AS
begin
Select top(@top) ph.name, sum(py.amount_paid) As total_paid
from dbo.policyholders ph
join dbo.policies p on ph.policyholder_id=p.policyholder_id
join dbo.claims c on p.policy_id=c.policy_id
join dbo.payments py on c.claim_id=py.claim_id
group by ph.Name
order by total_paid desc
End;

Exec GetTopClaimants @top=5
```

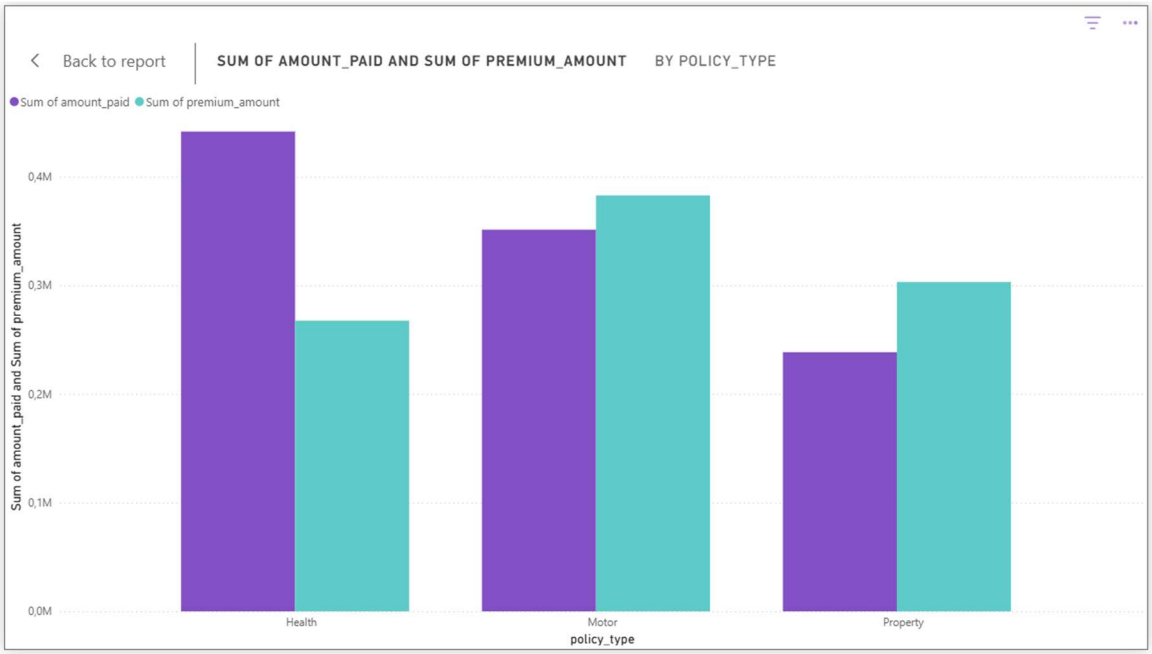
	name	total_paid
1	Philip Ray	200354.18
2	Jonathan Gonzalez	90590.52
3	Michael Garcia	69191.12
4	Patrick Harding	65988.47
5	Michelle George	62620.49

4. Visualisation



These pie charts compare the distribution of *claim amounts* and *claims paid* across policy types. The *claim amount* chart includes all claims (pending, rejected, and approved), while the *claims paid* chart reflects only approved and settled claims. Comparing the two highlights discrepancies between claimed vs. paid amounts, helping to identify policy types with higher rejection rates or larger unpaid exposures.





This graph reinforces the conclusion drawn from the loss ratios. It clearly shows that for Health policies, claims paid exceed premiums, indicating a loss. For Motor and Property policies, premiums exceed claims paid, but only marginally, leaving limited room for expenses or profit. Overall, the visual representation mirrors the insights provided by the loss ratio analysis.