2026 Student Research Case
Study Challenge
Data Dictionary

Actuaries in Space:
The Pricing Frontier
January 16, 2026

General Structure

Each of the four claim datasets (corresponding to the four lines of business specified in the Case Study Challenge Description) include a claim frequency tab and a claim severity tab.

Business Interruption Claims Dataset

Variable Name	Description	Type	Units	Value Range or Levels
policy_id	Policy identifier	character	--	e.g., BI-123456, …
station_id	Mining platform identifier	category	--	e.g., A1, G3, …
solar_system	Solar system identifier	category	--	{Helionis Cluster, Epsilon, Zeta}
production_load	Average utilization rate of production capacity	numeric	Ratio	$0 - 1$
energy_backup_score	Measure of adequacy of emergency power systems	category	--	{1, 2, 3, 4, 5}
supply_chain_index	Proportion of inputs sourced	numeric	Ratio	$0 - 1$
avg_crew_exp	Average experience of assigned staff	numeric	Earth years	$1 - 30$
maintenance_freq	No. of expected maintenance cycles per Earth year	numeric	Number	$0 - 6$
safety_compliance	Compliance score	category	--	{1, 2, 3, 4, 5}
exposure	Period of exposure in Earth years	numeric	Ratio	$0 - 1$
claim_count	Number of claims during the exposure period	numeric	Number	$0 - 4$
claim_amount [1]	Claim amount per claim	numeric	[currency]	$\sim 28K - 1,426K$

---

[1] This variable is included only in the severity tab.

Cargo Loss Claims Dataset

Variable Name	Description	Type	Units	Value Range or Levels
policy_id	Policy identifier	character	--	E.g., CL-963974, …
shipment_id	Shipment identifier	character	--	E.g., S-094788, …
origin	Planetary/satellite hub where cargo departs	category	--	{Earth, Mars, Moon, planet A, planet B, …}
destination	Planetary/satellite hub for cargo delivery	category	--	{Earth, Mars, Moon, planet A, planet B, …}
cargo_type	Type of goods shipped	category	--	{platinum, gold, …}
cargo_value	Declared insured value of shipment	numeric	Millions of solar system currency	~ 50K – 680,000K
weight	Weight of shipment	numeric	Kg (SI)	1.5K – 250K
route_risk	Risk classification of transport route	category	--	{1, 2, 3, 4, 5}
distance	Distance of transit route	numeric	Astronomical Units	1 – 100
transit_duration	Expected travel time	numeric	Earth months	1 – 60
pilot_experience	Average flight experience of assigned pilots	numeric	Earth years	1 – 30
vessel_age	Average age of vessel	numeric	Earth years	1 – 50
cointainer_type	Container used	category	--	{high cube, dry van, flat rack, …}
solar_radiation	Hazard index	numeric	Index	0 – 1
debris_density	Relative frequency of debris or asteroids in route	numeric	Index	0 – 1
exposure	Period of exposure in Earth years	numeric	Ratio	0 – 1
claim_count	Number of claims during the exposure period	numeric	Number	0 – 5
claim_amount[1]	Claim amount per claim	numeric	[currency]	~ 31K – 678,000K

Equipment Failure Claims Dataset

Variable Name	Description	Type	Units	Value Range or Levels
policy_id	Policy identifier	character	--	E.g., EF-12345, …
equipment_id	Equipment identifier	character	--	e.g., CH-176-LAKJDHF-113, …
equipment_type	Type of machinery	category	--	{Quantum Bore, Graviton Extractor, FluxStream Carrier, Mag-Lift Aggregator, Fusion Transport, Ion Pulverizer}
equipment_age	Time since commissioning	numeric	Earth years	0 – 10
solar_system	Solar system identifier	category	--	{Helionis Cluster, Epsilon, Zeta}
station_id	Mining platform identifier	category	--	e.g., A1, G3, …
maintenance_int	Time between scheduled maintenance cycles	numeric	Earth hours	100 – 5000
usage_intensity	Average operation time per Earth day	numeric	Earth hours	0 – 24
exposure	Period of exposure in Earth years	numeric	Ratio	0 – 1
claim_count	Number of claims during the exposure period	numeric	Number	0 – 3
claim_amount[1]	Claim amount per claim	numeric	[currency]	~ 11K – 790K

Workers' Compensation Claims Dataset

Variable Name	Description	Type	Units	Value Range or Levels
policy_id	Policy identifier	character	--	e.g., WC-12398, …
worker_id	Worker identifier	character	--	e.g., W-0001, …
solar_system	Solar system identifier	category	--	{Helionis Cluster, Epsilon, Zeta}
station_id	Mining platform identifier	category	--	e.g., A1, G3, …
occupation	Worker's primary job classification	category	--	{Administrator, Manager, Executive, Scientist, … }
employment_type	Type of employment contract	category	--	{Full time, Contract}
experience_yrs	Total Earth years of experience in similar occupation	numeric	Earth years	~ $0.2 - 40$
accident_history_flag	Whether workers have an injury record prior to current exposure year	category	--	{0, 1}
psych_stress_index	Surveyed job stress level	category	--	{1, 2, 3, 4, 5}
hours_per_week	No. of Earth hours worked	numeric	Earth hours	{20, 25, 30, 35, 40}
supervision_level	Ratio of supervisors to staff	numeric	Ratio	$0 - 1$
gravity_level	Mean gravity (relative to Earth = 1.0)	numeric	Index	$0.75 - 1.50$
safety_training_index	Quality of training	category	--	{1, 2, 3, 4, 5}
protective_gear_quality	Rating of protective equipment used	category	--	{1, 2, 3, 4, 5}
base_salary	Base pay for worker per Earth annum (FTE)	numeric	[currency]	~$20K - 130K$
exposure	Period of exposure in Earth years	numeric	Ratio	$0 - 1$
claim_count	Number of claims during the exposure period	numeric	Number	$0 - 2$
injury_type[1]	Type of injury	category	--	{Psychological, Amputation, Cut laceration, ---}
injury_cause[1]	Cause of injury	category	--	{Stress/strain, Vehicle accident, Exposure, …}
claim_length[1]	Number of Earth days away from work	numeric	Numbers	$3 - 1000$
claim_amount[1]	Claim amount per claim in the solar system currency	numeric	[currency]	$5 - 170$

Society of Actuaries Research Institute
8770 Bryn Mawr Ave, Suite 1000
Chicago, IL 60631
www.SOA.org