FOR ENGINEERING PROGRAMS · READY TO TEACH

Run an airline, keep it flying

Homework students can’t hand to AI. Pick a week’s topic, students run an airline, and they explain decisions only they made: reliability, maintenance, parts and systems trade-offs.

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maydaycontrol.com



THE AI HOMEWORK PROBLEM

Every student has AI. This homework still has to be their own.

THEIR OWN NUMBERS

Questions arrive filled in

When a simulation ends, each question carries that student’s own figures: their hours grounded, their parts used, their worst round. A generic AI answer does not fit.

THEIR OWN DECISIONS

Explain the why

Students apply the week’s concept to choices only they made. AI can polish the wording, but it cannot invent the decisions.

CHECKABLE

Matched to the record

Each answer sits next to the student’s simulation summary, so the instructor can check it against what actually happened.

Every week: play, then explain your own fleet’s results with that week’s concept: availability, downtime, parts and cost.

PLUG AND PLAY

Ready to teach: nothing to build, nothing to write from scratch

1

Plan

Copy a sample course plan from the catalog and adjust any week, or build a custom program around your syllabus with us.

Once per course

2

Week

Choose this week’s topic. Its features switch on and off to match, so students focus on one concept, such as deferral deadlines or parts.

One click a week

3

Limit

A 30 to 120 minute clock for a class session, or a number of rounds for homework.

Fits your schedule

4

Play

Students play alone against computer airlines, in teams on one laptop, or against each other online.

In class or at home

5

Grade

Built-in questions with each student’s numbers, a guide to a strong answer, a score and a CSV export.

On the class page

A custom program: send your syllabus topics to support@maydaycontrol.com and we build the weeks with you. **See it in 3½ minutes:** the instructor’s guide video at maydaycontrol.com.

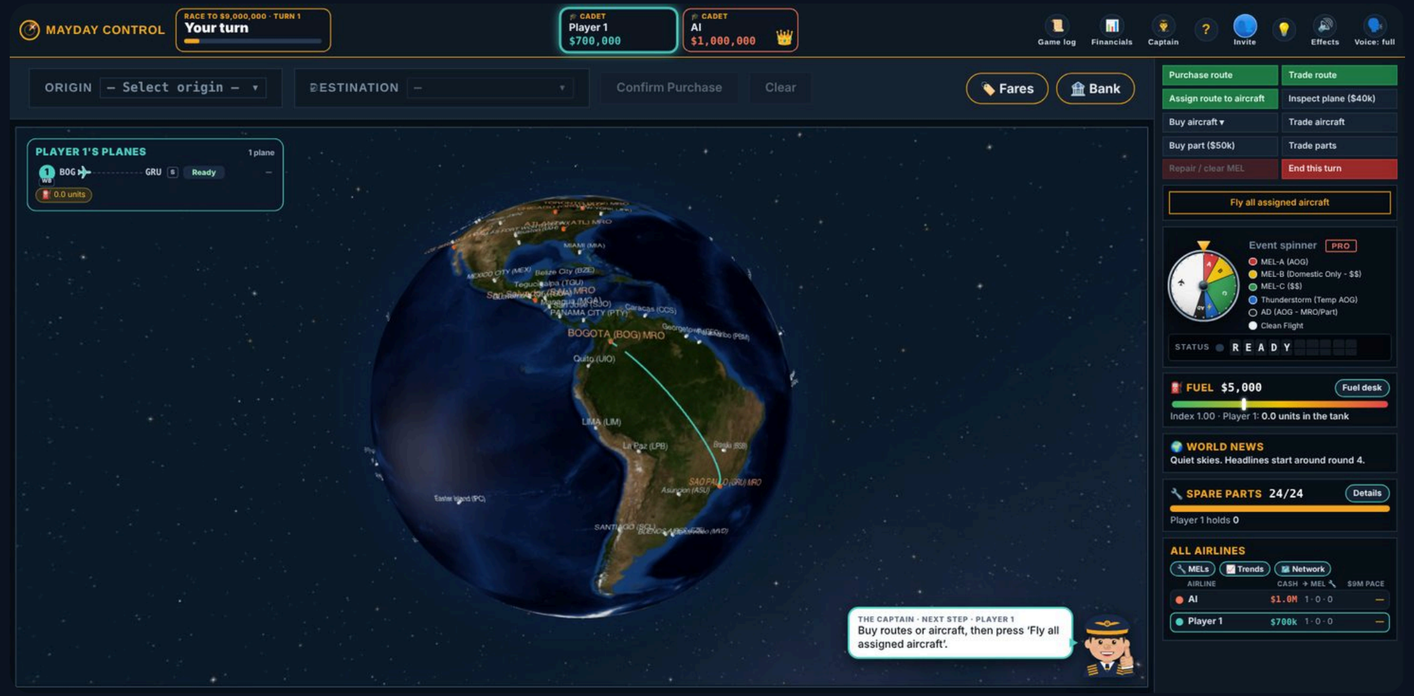
ACROSS THE CURRICULUM

One simulation, many engineering courses

Course	Concepts	What students do in Mayday Control
Reliability and maintenance	Failures, deferral, availability	Defer defects under MEL limits or fix them; manage groundings and inspections
Aerospace and aviation	Airworthiness, MEL, MRO	Respond to airworthiness directives; route aircraft to maintenance stations
Industrial engineering	Scheduling, capacity, queues	Assign aircraft to routes and keep the fleet productive
Supply chain and logistics	Inventory, scarcity, lead time	Buy spare parts from a shared pool whose price rises as it empties
Systems engineering	Trade-offs, network design	Balance cost, availability and growth across a hub network
Engineering economics	Life-cycle cost, payback, risk	Read a profit and loss for every aircraft; hedge fuel; price the cost of downtime

THE SIMULATION IN ONE MINUTE

Students run an airline against rival airlines



EVERY TURN

Buy routes and aircraft, set fares, buy fuel and parts, borrow, repair. Each choice has a price and an opportunity cost.

EVERY RESULT

Each plane has its own profit and loss. Financial statements export to Excel.

Browser based, no install. Quick Start takes about 6 minutes; Standard and Pro are full simulations with computer or human rivals.

HOW IT WORKS

How one turn works



The Standard screen: planes on the left, the 3D globe under a real star sky, race and airline cards on top, fuel, parts and rivals on the right

How to play in 8 languages: maydaycontrol.com/howto.html

1 Buy what your cash allows

Routes ($15k to $100k), a widebody ($400k) or narrowbody ($150k), spare parts (from $50k), repairs, inspections, fuel, trades and bank loans. Every plane costs to run each turn.

2 Fly

Press Fly all: every plane flies its own route. Narrowbodies feed the hubs; longer routes pay more.

3 Spin the event wheel

On hub-to-hub flights, six outcomes decide whether the flight is clean, restricted or grounded. A departures-style board shows the result.

4 Resolve the result

Fly to an MRO station and use a spare part to clear the fault, or sit grounded.

Try the guided tour

Realism: the event wheel

The six segments mirror real maintenance practice. Each flight ends with a spin.

Segment	What it represents	Effect in the simulation
White	Clean flight	Full revenue
Red: MEL-A	Deferral category A, aircraft on the ground (AOG)	No revenue; may only fly toward an MRO
Yellow: MEL-B	Deferral category B	Same-continent routes only, 50% revenue
Green: MEL-C	Deferral category C	Half revenue
Blue	Severe thunderstorm	Grounded for a turn, $50k fee
Black	Airworthiness directive	Diverted to an MRO, no pay, $50k clearing fee

Each slice carries a symbol (A, B, C, a lightning bolt for the storm, AD, a plane for a clean flight). When the wheel stops, the winning slice lights up and a split-flap **status board** flips its letters like an airport departures board: CLEAN 100%, MEL-B 50%, MEL-A AOG, STORM HOLD, AD DIVERT.



The wheel stops, the slice lights up, the board flips

Teaching point: an open fault stays on the aircraft until it is repaired, and faults stack: the worst one sets what the aircraft may do. The report tracks revenue lost to a fault left open from an earlier spin, so students learn when to pay now and when to defer.

RELIABILITY · THE EVENT WHEEL

Every flight is a draw from a failure distribution

Outcome	What happens to the aircraft	Standard	Pro
Clean flight	Full pay	50%	45%
MEL-C deferred	Keeps flying at half pay until fixed	21%	23%
MEL-B deferred	Domestic routes only, half pay until fixed	10%	11%
MEL-A, AOG	Grounded, no pay, $50k a turn until repaired	7%	8%
Thunderstorm	Held at the origin for one turn	7%	7%
Airworthiness directive	Diverts to the nearest maintenance station	5%	6%

The odds are shown in the simulation’s Help. Students can compute expected pay per flight, availability and the value of a repair, then check their numbers against the simulation’s statements.

MAINTENANCE · DEFER OR FIX

The same decision an airline engineer makes every day

DEFER

Keep flying, earn less

A deferred MEL-B or MEL-C keeps the aircraft in service at half pay, with fewer routes for a MEL-B.

FIX

Pay now, earn full

A repair needs a spare part and a visit to a maintenance station. No part on hand means the aircraft waits.

DEADLINES · PRO

Legal limits

Fix a MEL-B within 3 turns and a MEL-C within 6, or the aircraft is grounded.

DISCUSSION

When is it cheaper to keep flying with a deferral than to repair now? How does the answer change when parts run short or the deadline is close?

SUPPLY CHAIN · SPARE PARTS

A shared parts pool, and a price that rises as it empties

SCARCITY

24

Parts in the warehouse for every airline in a Pro simulation (40 in Standard). What one airline buys, the others cannot.

PRICE

$50k → 2×

A part starts at $50,000 and costs up to twice that as stock runs out.

ROTABLES

3 turns

A repair needs a part at a maintenance station. The removed part goes to overhaul and returns to its airline 3 turns later.

Questions it raises: how many parts should an airline hold as safety stock? When does buying early pay off? Where should maintenance stations sit in the network?

SYSTEMS ENGINEERING · NETWORK DESIGN

Hubs, feeders and the value of a connected system

HUB-TO-HUB

Widebody trunk routes

Long routes between hubs carry the most revenue, flown by $400k widebodies.

FEEDERS

Narrowbody spokes

Regional routes feed each hub. A trunk flight pays half with no feeders and in full with four.

THE GOAL

A connected network

One way to win: 10+ hub-to-hub routes across 3+ continents, held for 3 turns.

The whole is worth more than its parts: a cheap feeder route can raise the value of an expensive trunk route. Students design the system, then see where it breaks when one aircraft is grounded.

ENGINEERING ECONOMICS · LIFE-CYCLE COST

Fixed cost, running cost and the value of a network

FIXED COST

$400k

A widebody for hub-to-hub routes. A narrowbody costs $150k. Routes are bought once.

COST PER TURN

$20k

Running cost of a widebody each turn ($6k for a narrowbody), plus fuel, inspections ($40k in Pro) and repairs.

ECONOMIES OF SCOPE

50 → 100%

A hub-to-hub flight pays half with no feeder routes at its hub, and in full with four, flown by one narrowbody.

A marginal question students can answer from their own data: is a $150k narrowbody worth $6k a turn if it lifts every flight out of a hub from 75% to 100%?

RISK AND DECISION ANALYSIS

Decisions under uncertainty, with real consequences

OPERATIONAL RISK

Faults and weather

Known odds on every flight; groundings, storms and directives that take aircraft out of service.

PRICE RISK · PRO

Fuel hedging

Fuel prices move every round; a hedging desk offers tank buys and fixed-price contracts.

EXTERNAL RISK · PRO

World news

Booms, slumps, conflicts and disasters change demand region by region, announced a round ahead.

FINANCIAL RISK

Leverage

Borrow up to half of what the airline owns, at 5% a turn in Standard or 8% in Pro.

WHY IT WORKS

Engineering decisions have a cost, and the simulation shows it

Every deferral, repair, part and route shows up in an aircraft’s profit and loss, so students learn to argue for reliability in the language management uses.

HOW IT CAN RUN IN A COURSE

Three ways to use it, from one session to a graded week

IN CLASS · ONE SESSION

Keep the fleet flying

Each student plays alone against computer airlines with a 60-minute limit. The last round finishes and the highest owner’s equity wins.

ACROSS THE WEEK

Homework in rounds

A round limit for play at home, alone against the computer or against classmates online with 24-hour turns.

GRADED

Built-in questions

Up to eight questions from the bank, filled in with each student’s numbers and graded on the class page.

Sample questions, as a student sees them: “Your aircraft spent 7 aircraft-turns grounded, and you lost $186,000 to faults and storms. You bought 3 spare parts and used 2. Was your inventory too large, too small or right?” “You paid for 4 inspections, and 1 stopped a fault before take-off. Were they worth it?”

FOR THE INSTRUCTOR

One class page: the week, answers, grades

Class code

K7TQ4M

Copy invitation

Reliability Engineering 410

THIS WEEK'S MODULE

Airline operations and maintenance (4 weeks) · Week 3: Maintenance planning under deadlines

On: MEL deadlines, Bank loans · Off: Fares desk, World news

Limit: 60 minutes · 5 questions

ANSWERS AND GRADING

Student	Simulation	Score
Ana	Week 3 practice	88
Ben	Week 3 practice	To grade

Download answers and grades (CSV)

Illustration: the class, code and names are examples.

SET UP

Name the class, share the six-character code, and build a course plan from the catalog.

THIS WEEK

The topic, its features, a time or round limit and the questions. The server keeps them fixed.

GRADE AND PRIVACY

Score, comment, export to your gradebook. Instructors see names, never emails or ages.

IN THE CLASSROOM

One week of the course, in five steps

1
Choose
Pick the week from your course plan and click “Use for this class”. Every new class room follows it.

Before the session

2
Brief
When students start, a briefing shows the topic, what to watch, the features on and the questions to come.

First minute

3
Play
A clock shows the time left. When it runs out, the round finishes and the highest owner’s equity wins.

In class or across the week

4
Answer
The questions open with each student’s own numbers filled in, beside their simulation summary.

Same day

5
Grade
Read each answer next to a guide to a strong answer, give a score and a comment, and export a CSV.

On the class page

FOR THE DEBRIEF · FINANCIAL STATEMENTS

Every airline side by side, one click away

Key figures

	Player 1	AI
Revenue	$956,881 ★	$489,337
Operating expenses	−$215,393 ★	−$234,770
Operating income	$741,488 ★	$254,567
Operating margin	77% ★	52%
Loan interest	$0	$0
Invested (aircraft, routes, bids)	$0	−$181,000
Fuel cost	−$87,393	−$74,770 ★
Disruption fees	$0	$0
Fares vs Standard (whole game)	$163,664 ★	$8,521
Cash now	$1,281,460 ★	$1,014,978
Debt now	$0	$0
Owner's equity now	$2,411,460 ★	$1,994,978
Aircraft	3	2
Routes	9	4
Open MELs	0 ★	1

THE KEY FIGURES

Income statement and balance sheet lines for every airline, with ★ on the best one for each line.

ANY PERIOD

This round, the last four rounds or the whole simulation.

READY FOR CLASS

Prints as a one-page handout or downloads for Excel.

FOR THE DEBRIEF · TURNING POINTS

Why each airline’s cash changed direction



MARKER 6 · AI, ROUND 9

Cash peaked at $1,278,385, then fell $336,972.

MARKER 7 · PLAYER 1, ROUND 10

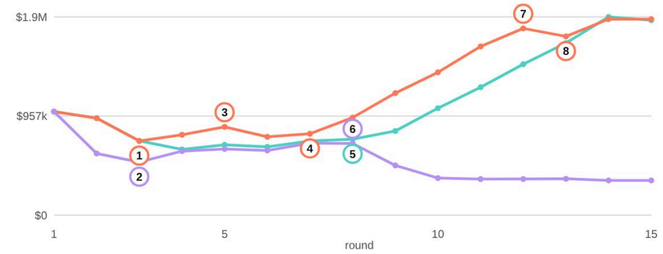
Cash stopped falling at $539,977, then rose $269,800.

Each numbered turn is explained in a log below the chart: the main drivers from that round’s ledger (revenue, aircraft bought, disruption fees) and the key moments (groundings, STAR contracts won, world news).

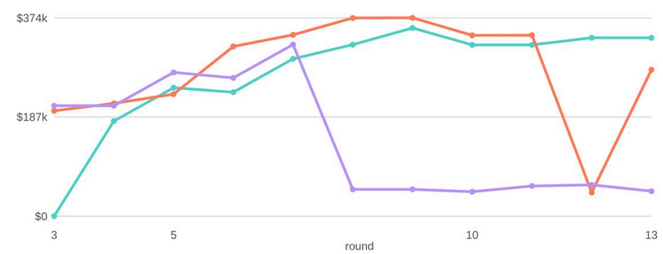
FOR THE DEBRIEF · ROUND BY ROUND

Cash, revenue and operating income, every airline

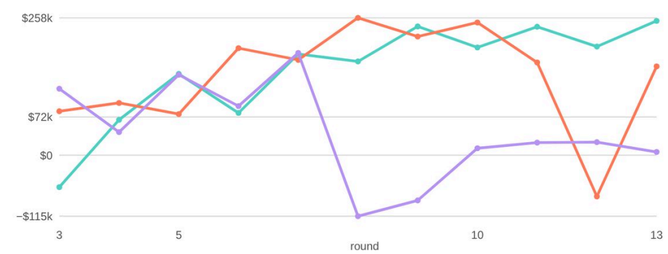
CASH



REVENUE PER ROUND



OPERATING INCOME PER ROUND



Player 1 Player 2 Player 3

READ ACROSS

Player 3’s revenue collapsed in round 8, its income went negative and its cash slid from then on.

ONE BAD ROUND

Player 2 led on revenue, yet one disrupted round sent its income negative. Cash barely noticed.

ANY TIME

All three open from Financials during the simulation, and print or download for Excel.

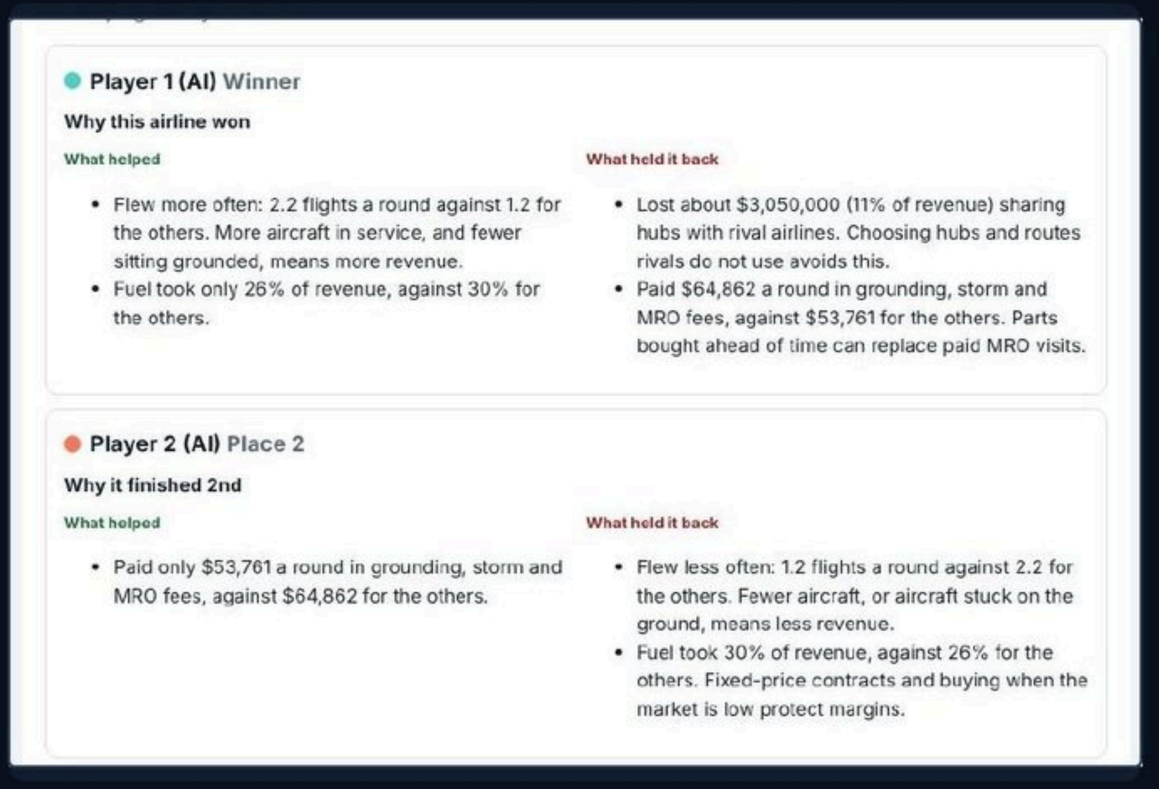
REAL OUTPUT FROM A TEST SIMULATION

Post-simulation report: a worked example

Where the money came from and went

Category	Player 1	Player 2
Route revenue	$17,390,000	$10,831,250
STAR contracts and mail pay	$313,750	$15,000
Fuel recovered in fares	$6,266,685	$3,864,132
Fuel (bought or settled)	-$6,121,853	-$4,479,367
Disruption fees (grounding, storm, AD, cargo penalty)	-$4,100,000	-$4,750,000
MRO service fees	-$2,970,000	-$1,110,000
Spare parts (bought, net of sales)	-$900,000	-$1,085,000
Aircraft purchases	-$1,200,000	-$1,200,000
Routes (bought, net of sales)	-$540,000	-$490,000
STAR contract bids	-$125,000	-$20,000
Change in cash over the game	**$8,013,583**	**$1,575,996**

Where the money went. Route revenue, fuel, fees, repairs, parts, aircraft, routes and auctions, side by side for each airline.



Why each airline finished where it did. The notes compare each airline with the average of the others. Here the winner flew 2.2 times a round against 1.2, despite paying more in fees. The notes explain the numbers; they do not judge every decision.

Both airlines in this sample simulation were played by the computer. Figures are generated by the simulation from its own record of each flight and purchase.

THE PRACTICAL DETAILS

What a class needs to run it

COST

One course license

Every level for each enrolled student, the class page and support. Quick Start is always free to try.

DEVICES

A browser

Laptop, tablet or phone. Nothing to install and no lab needed.

TIME

6 minutes to a few weeks

A 30 to 120 minute clock for a class session, or a number of rounds for homework.

ACCESS AND PRIVACY

Approved instructors

Instructor accounts are approved one by one. Simulated dollars are score only.

NEXT STEPS

A pilot in your course

TRY IT

maydaycontrol.com: Quick Start is free, and Pro includes one free simulation.

WATCH

The instructor’s guide, 3½ minutes, on the home page of maydaycontrol.com.

GUEST SESSION

A free guest session: a live simulation session and how airline engineering manages reliability, deferrals and parts.

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