1. The Case of the Leaning Tower of the Boeing 747

In the 1970s, Japan Airlines had a mysterious maintenance problem. Mechanics noticed that some of their Boeing 747 jumbo jets would *consistently* develop cracks in the same section of the fuselage — but only those operating certain Pacific routes.

Engineers checked for manufacturing defects, air pressure issues, even bad weather patterns. Nothing explained why the cracks appeared in *those* planes and not others.

After weeks of investigation, a young engineer spotted something odd in flight logs: the problem planes always landed at an airport near a beach resort.

Still, what did beaches have to do with metal fatigue?
Turns out, at this airport, maintenance crews would often *hose down* the planes to remove salt from sea spray. But they were using **untreated fresh water**, which, combined with microscopic salt particles left on the fuselage, created a perfect electrolyte for galvanic corrosion.

Moral: The cause wasn't "planes landing near beaches" — it was the *hidden chemical process* triggered by cleaning habits. Correlation gave the hint, but cause was hiding in plain sight.

2. The Case of the Stuttering Spacecraft

In 1997, NASA's Mars Pathfinder was happily sending data back to Earth — until it started **randomly freezing and rebooting**. Engineers feared it was a software bug, cosmic rays, or some Mars-specific mystery.

Telemetry analysis showed no obvious faults, except that reboots happened more when **multiple instruments** were collecting data at once.

One sharp-eyed software engineer recognized the pattern: it was a **priority inversion** problem. The spacecraft's operating system was letting a low-priority process hold a resource needed by a high-priority process, while a medium-priority process kept running and blocking the fix.

The cause wasn't Mars, radiation, or alien mischief — it was a classic *real-time systems* scheduling bug. A quick OS patch fixed it, and Pathfinder kept on working.

Moral: Even in space, strange failures can have very down-to-Earth explanations — but only if you think logically, collect data, and avoid jumping to conclusions.

3. Car Allergic to Vanilla Ice Cream

For the engineers among us who understand that the obvious is not always the solution, and that the facts, no matter how implausible, are still the facts ...

A complaint was received by the Pontiac Division of General Motors:

"This is the second time I have written you, and I don't blame you for not answering me, because I kind of sounded crazy, but it is a fact that we have a tradition in our family of ice cream for dessert after dinner each night. But the kind of ice cream varies so, every night, after we've eaten, the whole family votes on which kind of ice cream we should have and I drive down to the store to get it. It's also a fact that I recently purchased a new Pontiac and since then my trips to the store have created a problem. You see, every time I buy vanilla ice cream, when I start back from the store my car won't start. If I get any other kind of ice cream, the car starts just fine. I want you to know I'm serious about this question, no matter how silly it sounds: 'What is there about a Pontiac that makes it not start when I get vanilla ice cream, and easy to start whenever I get any other kind?'"

The Pontiac President was understandably sceptical about the letter, but sent an engineer to check it out anyway. The latter was surprised to be greeted by a successful, obviously well-educated man in a fine neighbourhood. He had arranged to meet the man just after dinner time, so the two hopped into the car and drove to the ice cream store. It was vanilla ice cream that night and, sure enough, after they came back to the car, it wouldn't start.

The engineer returned for three more nights. The first night, the man got chocolate. The car started. The second night, he got strawberry. The car started. The third night he ordered vanilla. The car failed to start.

Now the engineer, being a logical man, refused to believe that this man's car was allergic to vanilla ice cream. He arranged, therefore, to continue his visits for as long as it took to solve the problem. And toward this end he began to take notes: he jotted down all sorts of data, time of day, type of gas used, time to drive back and forth, etc. In a short time, he had a clue: the man took less time to buy vanilla than any other flavour. Why? The answer was in the layout of the store.

Vanilla, being the most popular flavour, was in a separate case at the front of the store for quick pickup. All the other flavours were kept in the back of the store at a different counter where it took considerably longer to find the flavour and get checked out.

Now the question for the engineer was why the car wouldn't start when it took less time. Once time became the problem -- not the vanilla ice cream -- the engineer quickly came up with the answer: vapour lock. It was happening every night, but the extra time taken to get the other flavours allowed the engine to cool down sufficiently to start. When the man got vanilla, the engine was still too hot for the vapour lock to dissipate.

Moral of the story: even insane-looking problems are sometimes real.