1. I started by producing the **full 31-component + synonym table** from the FSAE PDF so we can use it directly in the synthetic data generator.

| **#** | **Canonical Name** | **Common Synonyms / Variants** |
| --- | --- | --- |
| 1 | Accumulator Container | battery container, energy storage box |
| 2 | Impact Attenuator | crash attenuator, nose cone damper |
| 3 | Front Hoop | roll hoop front, front roll bar |
| 4 | Main Hoop | roll hoop main, main roll bar |
| 5 | Side Impact Structure | side crash structure, SIS |
| 6 | Front Bulkhead | forward bulkhead, nose bulkhead |
| 7 | Rear Bulkhead | aft bulkhead, firewall |
| 8 | Steering Wheel | wheel, driver wheel |
| 9 | Steering Column | column, steering shaft |
| 10 | Steering Rack | rack and pinion, steering gear |
| 11 | Suspension A-arm | wishbone, control arm |
| 12 | Upright | wheel upright, knuckle |
| 13 | Pushrod | suspension push rod |
| 14 | Rocker | bell crank, suspension rocker |
| 15 | Damper | shock absorber, suspension damper |
| 16 | Anti-roll Bar | sway bar, stabilizer bar |
| 17 | Brake Caliper | caliper |
| 18 | Brake Disc | rotor, brake rotor |
| 19 | Brake Master Cylinder | master cylinder |
| 20 | Pedal Box | pedal assembly |
| 21 | Seat | driver seat |
| 22 | Headrest | head restraint |
| 23 | Harness | seat belt, safety belt |
| 24 | Firewall | bulkhead (rear), fire bulkhead |
| 25 | Radiator | cooling radiator |
| 26 | Sidepod | cooling pod |
| 27 | Diffuser | rear diffuser |
| 28 | Wing | aerofoil, rear wing, front wing |
| 29 | Chassis / Frame | frame, spaceframe, monocoque |
| 30 | Floor | undertray |
| 31 | Jacking Point | lift point |

1. Next I created the synthetic data notebook to