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| TC No. | Test Case Description | Input/Action | Expected Output/Result |
| TC1 | Shift Gear to DRIVE | shiftGear(GearType::DRIVE) | Gear state is DRIVE |
| TC2 | Accelerate car in DRIVE gear | accelerate(50) after shifting to DRIVE | Speed becomes 50 |
| TC3 | Brake car partially | brake(20) when speed is 50 | Speed becomes 30 |
| TC4 | Brake car fully | brake(40) when speed is 30 | Speed becomes 0 (no negative speed) |
| TC5 | Accelerate in PARK gear | accelerate(50) without shifting from PARK | Speed remains 0 |
| TC6 | Set valid destination | setDestination(10.0, 20.0) | Destination is set to (10.0, 20.0) |
| TC7 | Drive with valid time and speed | Speed = 60, Drive = 0.5 hr | Car moves from current location (approx. halfway if total distance > distance) |
| TC8 | Drive when in PARK gear | Gear = PARK, speed > 0, drive(0.5) | Car does not move |
| TC9 | Drive with no destination set | Destination not set, drive(1) | No movement, no crash |
| TC10 | Time to destination calculation | Speed = 60, distance = 60 km | Returns 1.0 hour |
| TC11 | Has arrived at destination | Current = Destination | Returns true |
| TC12 | Has not arrived at destination | Current ≠ Destination | Returns false |
| TC13 | Invalid acceleration (negative) | accelerate(-10) | Speed unchanged |
| TC14 | Invalid braking (negative) | brake(-5) | Speed unchanged |
| TC15 | Continuous drive until arrival | Speed = 60, Drive repeatedly until hasArrived() is true | Eventually arrives at destination |
| TC16 | Shift gear and observe behavior | Cycle through all gears and test acceleration | Only DRIVE or REVERSE allow acceleration |
| TC17 | Print status at different states | Call printStatus() after each major action | Displays correct gear, speed, and coordinates |
| TC18 | Location interpolation during partial drive | Drive 0.5 hr to a far destination | Current location is a proportional point between start and destination |