M20HSS316-ITP/Assignment-6/20171213/CSD

Let's consider one way of defining the composition: some objects (B1, B2, B3, ...) (together) are said to compose some other object (A) if they follow these rules.

1. **All the objects (B_1, B_2, ...), interact with each other either directly or indirectly.**
    1. If B_i and B_j interact directly, they interact with each other.
    2. If B_i and B_j interact indirectly, then there exists a sequence of B_i, B_i1, B_i2, ..., B_j in which the two adjacent objects interact directly.
2. **The interaction of the objects (B_1, B_2, ...) is giving rise to some new collective property (either behavioural or physically) and Object A is said to have this new property.**

To explain how these rules apply, let's consider some examples each differing from others.

1. **Let A = car, and (B_1, B_2, ...) = (wheels, seat, seat belts,...)**
    1. Consider wheels and other objects (not wheels) of which the car is composed of, now wheels are interacting with the other objects in a sense that they are helping them move around. There is a force acting between the wheels and them, which is the reason for them to move and so on with other pairs (i.e. they are interacting directly or indirectly).
    2. The new property is that of a car, which is now able to move and people can sit inside and control, which wasn't a property of all the objects which compose together to make a car.
2. **Let A = Oxygen Molecule, B_1 = B_2 = Oxygen Atom**
    1. Firstly, while forming the oxygen molecule (O_2), two individual oxygen atoms interact, that is there is a force acting between them which is both attractive and repulsive with the attractive one dominating.
    2. Secondly, this interaction is giving rise to new properties of (O_2) molecules which weren't seen in individual Oxygen atoms. Oxygen atoms aren't stable and are always trying to react with other atoms while, Oxygen molecule is stable i.e. does not need to react and can exist independently for long.
3. **Let A = milky way galaxy, B_1, B_2, ... = planets, stars, and others..**
    1. B_1, B_2, B_3, ... all are interacting with some other in a direct or indirect sense (as there are fundamental forces acting between all).
    2. They all are giving rise to a galaxy which in itself is different from individual planets.

Another possible definition provided in the question itself is "some objects compose another object if and only if they are stuck together."

-- Assuming that stuck means, they are touching and glued together.-- This is not a correct definition as, consider the third example above of the milky way galaxy, in that they aren't stuck together as there are spaces empty between them still they form a composition.

The given way of defining also takes into consideration the example of me touching my phone. Yes, it follows the first rule but not the second one because as a whole it is not giving rise to some general new property.