

- **The intact column** : the straight column that is connected to the ground and the ceiling in the first floor (num0)

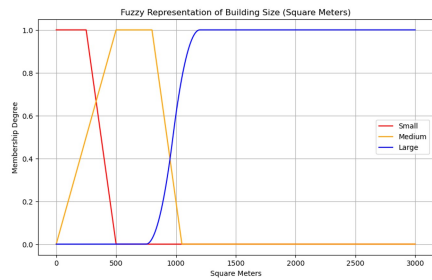
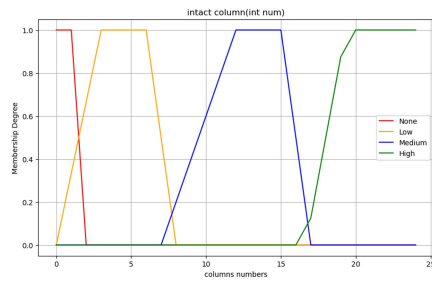
General rules:

| Intact columns | Damage level |
|----------------|--------------|
| none | severe |
| low | heavy |
| medium | moderate |
| high | light |

Area of the building with the intact columns Rules:

| aspect | Intact columns rate | | | |
|--|---------------------|----------|----------|----------|
| Building size (area in squared meters) | low | medium | high | |
| | small | moderate | light | Light |
| | Medium | Heavy | moderate | light |
| | large | severe | Heavy | Moderate |

If the intact columns are none (either 0 or 1) then: **It's definitely Severe**

**Visible rubble damage /change in the original shape (percentage)**

100% -> means totally on the ground nothing is visible

50% -> half of the building is destroyed

0% -> no ceilings on the ground



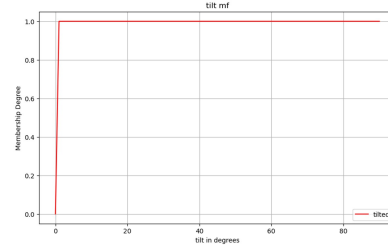
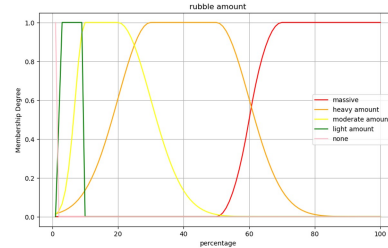
Here the visible damage is 25%

25%



Here the visible damage is 37% this part of the building is the only part that is on the ground destroyed

37%

Tilted crisp mf**Change in the original shape of the building (rubble amount)****! Walls are not important in Reinforced concrete buildings**

/same as original shape



If the building tilts at any degree then it has changed completely and is considered as a lot of change in the shape

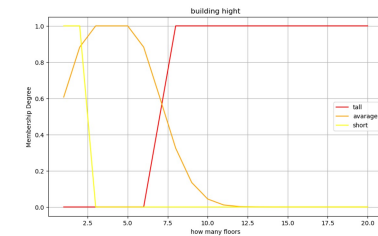
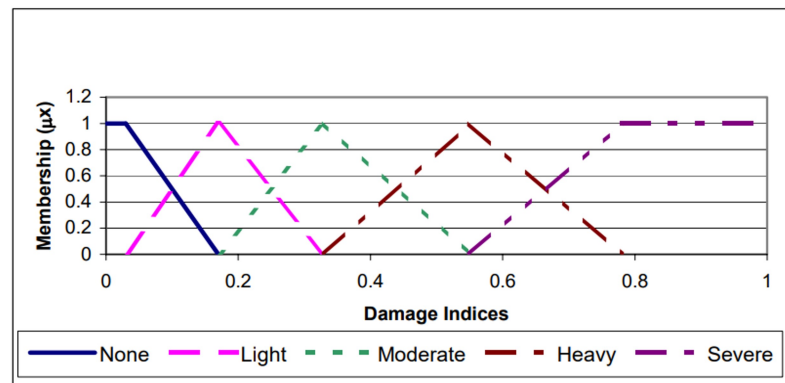
100%

Tilt and rubble% if statements

| Visible damage (rubble/tilt) | Damage level |
|-----------------------------------|--------------|
| the building tilts more than 1deg | Severe |
| Massive amount of rubble | Severe |
| Heavy amount of rubble | Heavy |
| Moderate amount of rubble | Moderate |
| Light amount of rubble | Light |
| Very little amount to none | None |

| aspect | Visible damage (rubble/tilt) | | | |
|--|------------------------------|----------|----------|----------|
| Building size (area in squared meters) | light | Moderate | Heavy | |
| | small | moderate | Heavy | Severe |
| | Medium | light | moderate | Heavy |
| | large | light | light | Moderate |

| aspect | Visible damage (rubble/tilt) | | | |
|---------------------------------|------------------------------|----------|----------|--------|
| Building height (floor numbers) | light | Moderate | Heavy | |
| | Short | light | moderate | Heavy |
| | average | moderate | moderate | Heavy |
| | Tall | moderate | Heavy | Severe |

**Damage result:**

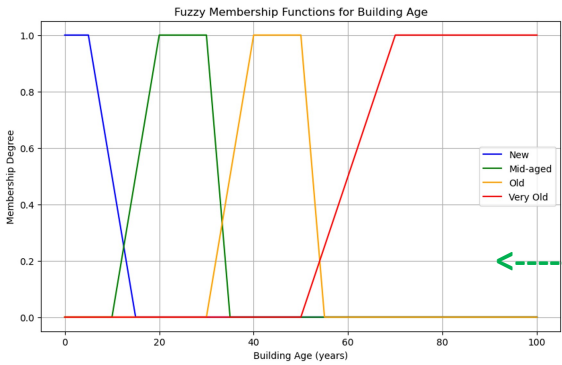
Getting insights based on the building's damage and age:

Building Habitability :

Habitability:
U: Usable
R: Restricted
P: Prohibited
D: Dangerous

| Habitability | Age of the building | | | | |
|--------------|---------------------|-----|----------|-----|--|
| | Very-old | old | Mid-aged | new | |
| None | U | U | U | U | |
| Light | R | U | U | U | |
| Moderate | P | R | R | R | |
| Heavy | D | P | P | P | |
| Severe | D | D | D | D | |

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| Reparability | Age of the building | | | | |
|--------------|---------------------|-----|----------|-----|--|
| | Very-old | old | Mid-aged | new | |
| None | S | R | M | M | |
| Light | S | R | M | M | |
| Moderate | S | R | R | R | |
| Heavy | D | S | S | S | |
| Severe | D | D | D | D | |

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Building Reparability :

Reparability:
M: Not any or minor
R: Reparation
S: Strengthening
D: Possible demolition

Used membership function for building age