UML Class Diagram

Driver
- operation(): Main()

Mechanic
- operation(): Mechanic()
- operation2(): Unlock()
- operation3(): tuneup()
- operation4(): wash()
- operation5(): testDrive()
- operation6(): lockup()

MyObservable
- operation(): notifyObserver()
- operation2(): notifyObserver(object)

Garage
- attribute: VehicleList
- operation(): Garage()

GarageAnnouncer
- operation(): update()2

MyObserver
- operation(): update()

Vehicle
- attribute: License
- operation(): getLicense()
- operation2(): Unlocked()
- operation3(): Runs()
- operation4(): Shines()
- operation5(): Sparkle()
- operation6(): Drives()
- operation7(): Locked()
- operation8(): toString()

GarageEmployee
- attribute: EmployeeName
- operation(): Unlock()

Train
- operation(): Train()

FreightTrain
- operation(): toString()
- operation2(): FreightTrain()

ExpressTrain
- operation(): toString()
- operation2(): ExpressTrain()

Motorcycle
- operation(): Motorcycle()

Car
- operation(): Car()
- operation2(): Runs()
- operation3(): Sputters()

Truck
- operation(): Truck()

Bike
- operation(): toString()
- operation2(): Bike()

Sidecar
- operation(): toString()
- operation2(): Sidecar()

HatchBack
- operation(): toString()
- operation2(): Hatchback()

SUV
- operation(): toString()
- operation2(): SUV()

Pickup
- operation(): toString()
- operation2(): Pickup()

Delivery
- operation(): toString()
- operation2(): Delivery()

Trike
- operation(): toString()
- operation2(): Trike()

Wagon
- operation(): toString()
- operation2(): Wagon()

Monster
- operation(): toString()
- operation2(): Monster()
- operation3(): Drives()
- operation4(): Crashes()

```
┌─────────────────┐
│    CarWash      │
├─────────────────┤
│  wash(Car)      │
└─────────────────┘
```

```
┌──────────────────┐     ┌──────────────────┐        ┌─────────────┐
│  Wash Vehicle    │     │  Wash Decorator  │        │   Detail    │
├──────────────────┤     ├──────────────────┤        ├─────────────┤
│  wash(Car)       │     │  wash(Car)       │        │  wash(Car)  │
└──────────────────┘     └──────────────────┘        └─────────────┘
```

```
┌──────────────────┐                                  ┌─────────────┐
│     Scrub        │                                  │   Polish    │
├──────────────────┤                                  ├─────────────┤
│  wash(Car)       │                                  │  wash(Car)  │
└──────────────────┘                                  └─────────────┘
```

```
┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐
│     Soap         │     │     Rinse        │     │      Wax         │
├──────────────────┤     ├──────────────────┤     ├──────────────────┤
│  wash(Car)       │     │  wash(Car)       │     │  wash(Car)       │
└──────────────────┘     └──────────────────┘     └──────────────────┘
```

```
                         ┌──────────────────┐
                         │      Dry         │
                         ├──────────────────┤
                         │  wash(Car)       │
                         └──────────────────┘
```

```
┌──────────────────────────────┐
│  Singlton                    │
├──────────────────────────────┤
│  unique                      │
│  name                        │
├──────────────────────────────┤
│  getInstance()               │
│  getNameFromUser()           │
│  getName()                   │
│  DisplayMenu()               │
│  getActionFromUser()         │
└──────────────────────────────┘
```

```
┌─────────────────────┐                    ┌─────────────────────┐
│ CommandControl      │                    │ Command             │
├─────────────────────┤         ──────>    ├─────────────────────┤
│ setCommand()        │                    │ execute()           │
│ runCommand()        │                    └─────────────────────┘
└─────────────────────┘                         ↑  ↑  ↑  ↑  ↖
                                                              ┌─────────────────┐
                                                              │ LockCommand     │
                      ┌─────────────────┐                     ├─────────────────┤
                      │ UnlockCommand   │                     │ execute()       │
                      ├─────────────────┤                     └─────────────────┘
                      │ execute()       │
                      └─────────────────┘
                                        ┌─────────────────────┐
                                        │ TuneUPCommand       │
                                        ├─────────────────────┤
                 ┌─────────────────────┐│ execute()           │
                 │ Wash Command        │└─────────────────────┘
                 ├─────────────────────┤
                 │ execute()           │      ┌─────────────────────┐
                 └─────────────────────┘      │ TestDriveCommand    │
                                              ├─────────────────────┤
                                              │ execute()           │
                                              └─────────────────────┘
```

(5) UML use Case diagram of Mechanic (Actor)

Mechanic

notify observer ⟨extends⟩ Garage Announcer

unlock

tune up ⟨extends⟩ Vehicle

Wash

test Drive

lock up

③ UML Sequence diagram

Garage Clock	Garage Announcer	Mechanic	Vehicle

At Time = 8AM → Announces → unlock → / unlocked

At Time : 9 AM → Announces → tuneup → / runs

At Time :10 AM → Announces → wash → / washed

At time : 11AM → Announcy → testDrive → / driven

At time : 12pm → Announces → lockup → / locked
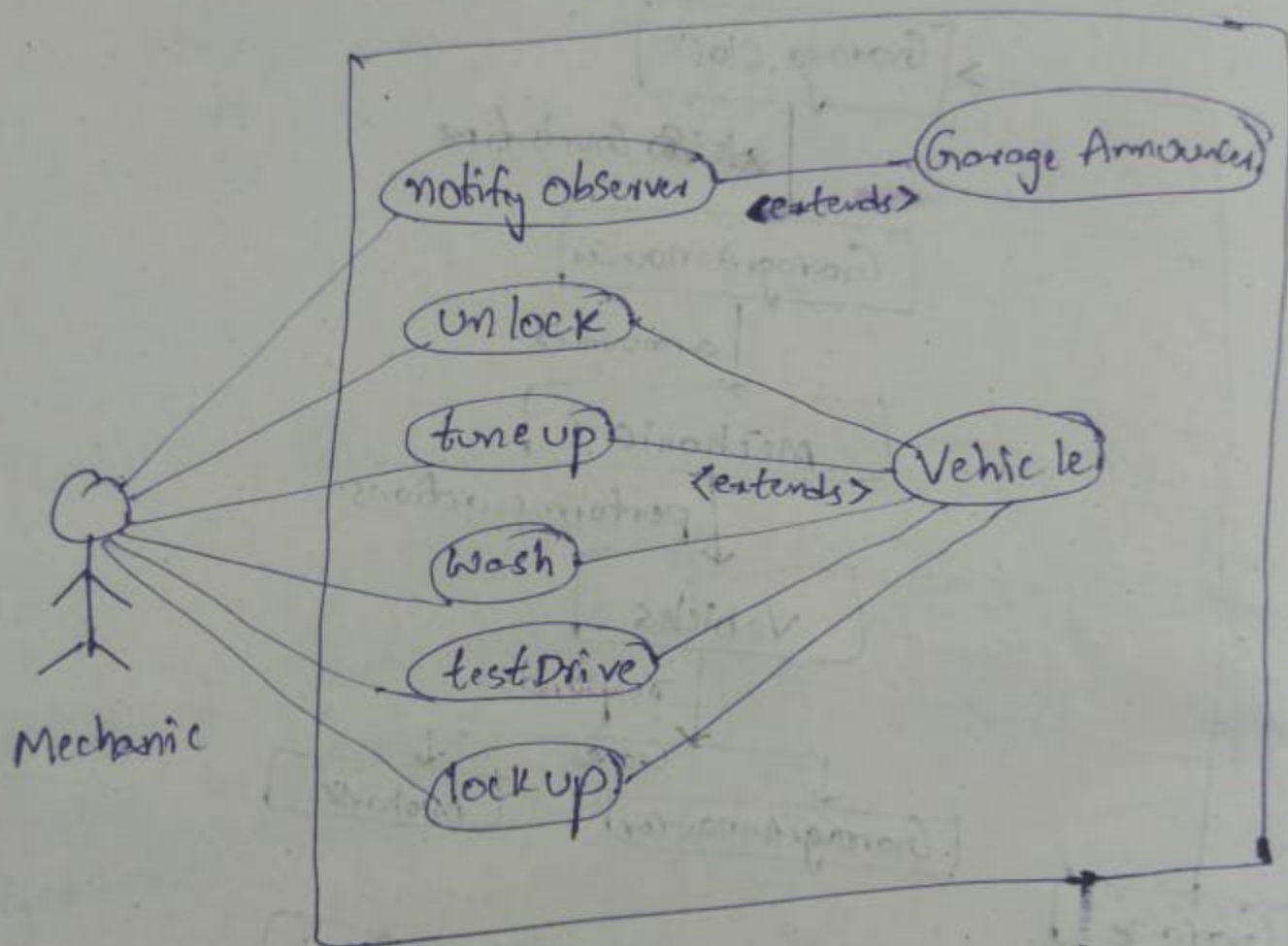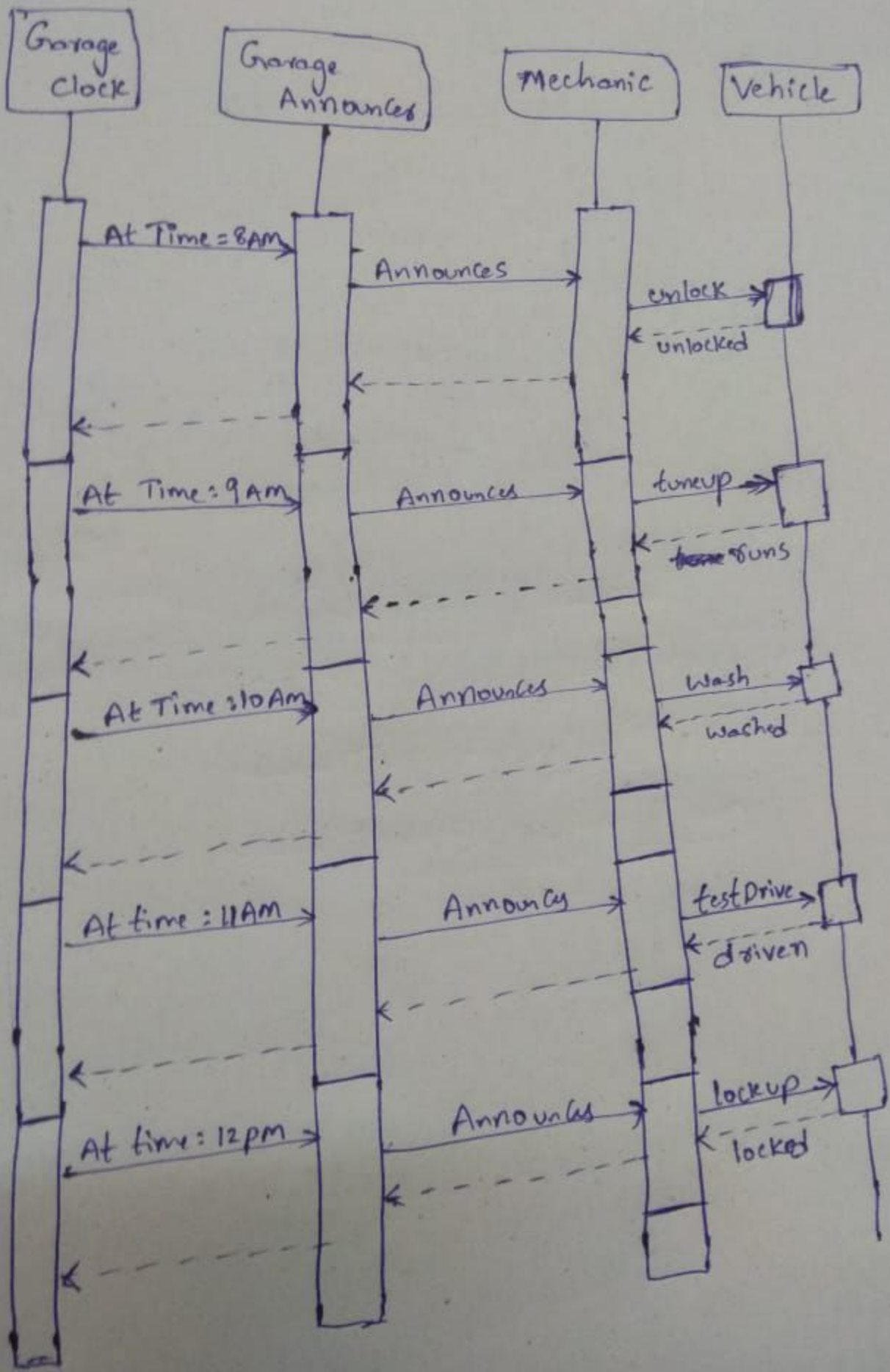
(4)   UML Activity diagram for a single day at garage.

```
                        ┌──────────────────┐
              ┌────────→│   Garage Clock   │
              │         └──────────────────┘
              │                  │ Counts time
              │                  ↓
              │         ┌──────────────────┐
              │         │ Garage Announcer │
              │         └──────────────────┘
              │                  │ announces
              │                  ↓
              │         ┌──────────────────┐
              │         │     Mechanic     │
              │         └──────────────────┘
              │                  │ performs actions
              │                  ↓
              │         ┌──────────────────┐
              │         │     Vehicles     │
              │         └──────────────────┘
              │                  │ responds
              │                  ↓
              │          ┌──────Leaves──────┐
              │          ↓                  ↓
              │  ┌──────────────────┐  ┌──────────┐
              │  │ Garage Announcer │  │ Mechanic │
              │  └──────────────────┘  └──────────┘
              │
   ┌──────────┐
   │  Garage  │
   └──────────┘
        │ creates
        ↓
   ┌──────────┐          ┌──────────────┐   ┌──────┐
   │ Vehicles │────┬────→│ Car Factory  │──→│ Car  │
   └──────────┘    │     └──────────────┘   └──────┘
                   │                         ┌────────────┐
                   ├────→┌────────────────┐ │ Motor cycle│
                   │     │Motorcycle Factory│─→└────────────┘
                   │     └────────────────┘
                   │     ┌──────────────┐   ┌──────┐
                   ├────→│ Truck Factory│──→│ Truck│
                   │     └──────────────┘   └──────┘
                   │     ┌──────────────┐   ┌──────┐
                   └────→│ Train Factory│──→│ Train│
                         └──────────────┘   └──────┘
```