2-HOUR PRACTICAL TASK

📌 Task: Implement Manual Iterator Examples

Task-1: Iterate list manually

Write code using:

- Iterator
- For-each
- ListIterator (reverse traversal)

```
ListIterator<String> itr = list.listIterator(list.size());
while(itr.hasPrevious()) {
    System.out.println(itr.previous());
}
```

Task-2: Demonstrate Fail-Fast

Create ArrayList and cause concurrent modification exception

```
Iterator<String> itr = list.iterator();
while(itr.hasNext()) {
    list.add("new"); // intentionally create error
}
```

Task-3: Demonstrate Fail-Safe

Using CopyOnWriteArrayList

```
CopyOnWriteArrayList<Integer> numbers = new
CopyOnWriteArrayList<>();
numbers.add(1); numbers.add(2);

for(Integer n : numbers){
    numbers.add(3);
```

```
}
```

Task-4: Real-world Simulation

Scenario:

Hospital emergency queue updates while doctor list is being processed

Create:

- Doctor list → ArrayList (fail-fast)
- Doctor live update list → CopyOnWriteArrayList (fail-safe)

Compare behavior & write explanation (5-8 lines)

Expected Interview Questions

1. What is fail-fast vs fail-safe?
2. Why does ConcurrentModificationException occur?
3. Real-world example of fail-safe usage
4. Difference between Iterator and ListIterator