

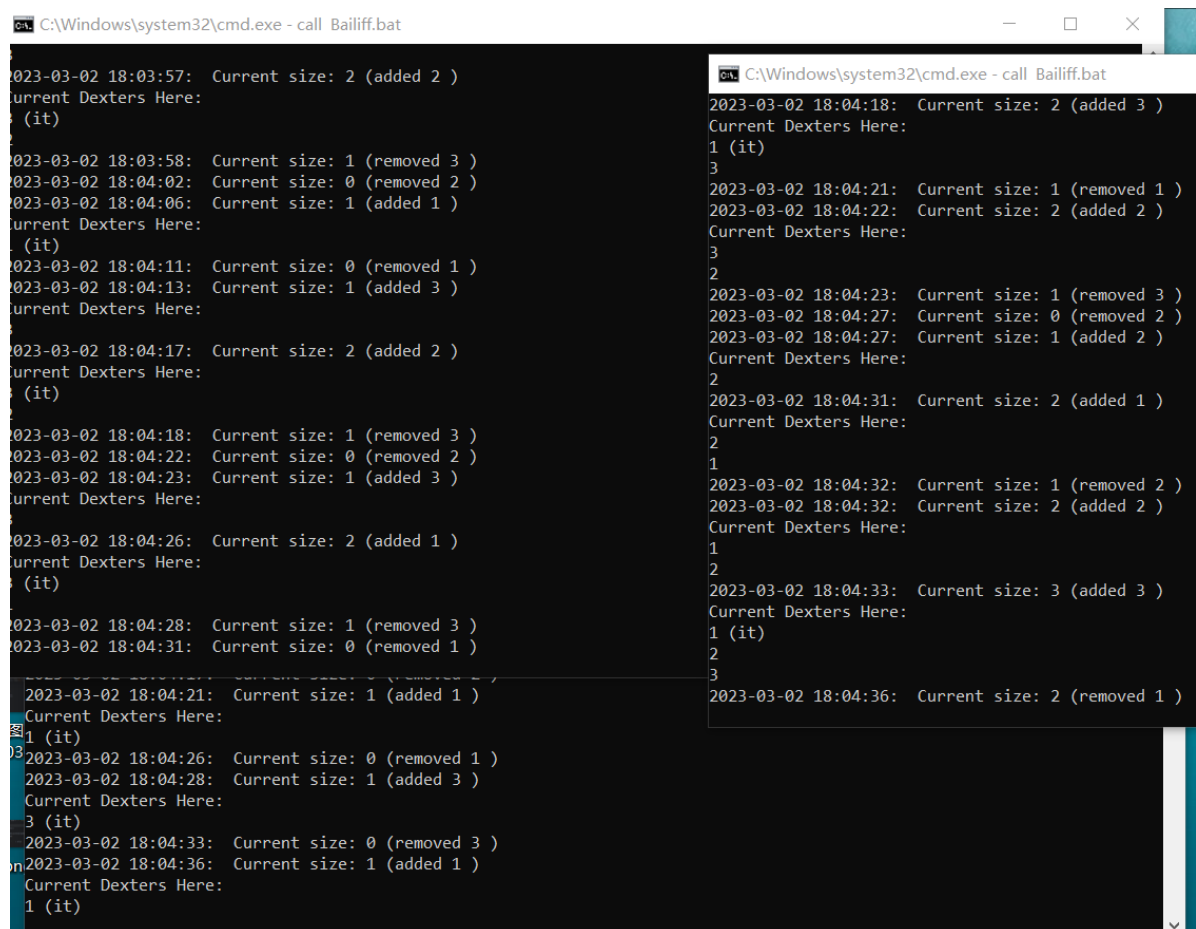
LAB2 TAG-Programs

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1. Achieve Effect

The image below illustrates the basic functionality implemented.



```
C:\Windows\system32\cmd.exe - call Bailiff.bat
2023-03-02 18:03:57: Current size: 2 (added 2 )
Current Dexters Here:
1 (it)
2023-03-02 18:03:58: Current size: 1 (removed 3 )
2023-03-02 18:04:02: Current size: 0 (removed 2 )
2023-03-02 18:04:06: Current size: 1 (added 1 )
Current Dexters Here:
1 (it)
2023-03-02 18:04:11: Current size: 0 (removed 1 )
2023-03-02 18:04:13: Current size: 1 (added 3 )
Current Dexters Here:
2023-03-02 18:04:17: Current size: 2 (added 2 )
Current Dexters Here:
1 (it)
2023-03-02 18:04:18: Current size: 1 (removed 3 )
2023-03-02 18:04:22: Current size: 0 (removed 2 )
2023-03-02 18:04:23: Current size: 1 (added 3 )
Current Dexters Here:
2023-03-02 18:04:26: Current size: 2 (added 1 )
Current Dexters Here:
1 (it)
2023-03-02 18:04:28: Current size: 1 (removed 3 )
2023-03-02 18:04:31: Current size: 0 (removed 1 )
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2023-03-02 18:04:21: Current size: 1 (added 1 )
Current Dexters Here:
1 (it)
2023-03-02 18:04:26: Current size: 0 (removed 1 )
2023-03-02 18:04:28: Current size: 1 (added 3 )
Current Dexters Here:
3 (it)
2023-03-02 18:04:33: Current size: 0 (removed 3 )
2023-03-02 18:04:36: Current size: 1 (added 1 )
Current Dexters Here:
1 (it)

C:\Windows\system32\cmd.exe - call Bailiff.bat
2023-03-02 18:04:18: Current size: 2 (added 3 )
Current Dexters Here:
1 (it)
3
2023-03-02 18:04:21: Current size: 1 (removed 1 )
2023-03-02 18:04:22: Current size: 2 (added 2 )
Current Dexters Here:
3
2
2023-03-02 18:04:23: Current size: 1 (removed 3 )
2023-03-02 18:04:27: Current size: 0 (removed 2 )
2023-03-02 18:04:27: Current size: 1 (added 2 )
Current Dexters Here:
2
2023-03-02 18:04:31: Current size: 2 (added 1 )
Current Dexters Here:
2
1
2023-03-02 18:04:32: Current size: 1 (removed 2 )
2023-03-02 18:04:32: Current size: 2 (added 2 )
Current Dexters Here:
1
2
2023-03-02 18:04:33: Current size: 3 (added 3 )
Current Dexters Here:
1 (it)
2
3
2023-03-02 18:04:36: Current size: 2 (removed 1 )
```

2. Design Choices

- The player needs cooperation from the bailiff so that it can get list of players currently located in a bailiff. I have used the following method to enable this. (Bailiff has a List to store all Dexter inside)

```
public List<Dexter> getDexters()  
    throws java.rmi.RemoteException;
```

- Players need to query other players to check if they are 'it' or not. (Use object bfi to iterate over all Dexter inside)

```

    if (obj instanceof BailiffInterface){
        bfi = (BailiffInterface) obj;
        List<Dexter>list=bfi.getDexters();
        for(int i=0;i<list.size();i++){
            if(list.get(i).isTagged()){
                enter=true;
                break;
            }
        }
    }
}

```

- Player that has 'it' should be able to tag other players. I have implemented the function Tag with the old Dexter being passed as the first parameter and the new Dexter being passed as the second parameter.

```

public void tag(Dexter oldIt, Dexter newIt)
    throws java.rmi.RemoteException;

```

- It sends a copy of itself to the other Bailiff, and if the copy was successful, the original object terminates its thread of execution and goes to garbage collection. (In the method ping(), the Dexter is added into the list in advance)

```

bfi.migrate(this, "topLevel", new Object[]{});

```

- The problem of "Tag is lost from the game"(Method is following)

```

if (obj instanceof BailiffInterface) {
    bfi = (BailiffInterface) obj;

    if(preBailiff != null) {
        debugMsg(preBailiff.getBID());
        debugMsg("preBailiff");
        List<Dexter> list = preBailiff.getDexters();
        for(int i=0; i< list.size(); i++)
        {
            //solve 'it' disappearance problem
            if(list.get(i).getID().equals(getID()))
            {
                setTagged(list.get(i).isTagged());
                break;
            }
        }
        preBailiff.remove( dex: this); // remove this before termination
    }
    debugMsg("preBailiff1111");
    try {
        String response = bfi.ping( dex: this); // Ping it
        debugMsg(response);
        accepted = true; // It worked!
        preBailiff = bfi; //saving for future ping - to remove dexter from list
        debugMsg("it:"+bfi.getIt());
        if(isTagged)
        {
            List<Dexter> list = bfi.getDexters();
            for(int i=0; i<list.size(); i++)
            {

```

Method: At the beginning of the running of each thread's `topLevel()`, I delete them from the Bailiff list and determine their own tagged values according to the Tagged attribute of the Dexter object in Bailiff's list added by the father when pinging this Bailiff, and then ping() the new Bailiff, go round and round.

- How to select Bailiff to jump into?

I select the Baillif without 'it'.

```
boolean enter;
//chose the bailiff without 'it'
do{
    idx = rnd.nextInt(nofItems);
    Object obj = svcItems[idx].service;
    enter=false;
    if (obj instanceof BailiffInterface){
        bfi = (BailiffInterface) obj;
        List<Dexter>list=bfi.getDexters();
        for(int i=0;i<list.size();i++){
            if(list.get(i).isTagged()){
                enter=true;
                break;
            }
        }
    }
}while(enter);
```