

# Everything in MainActivity

## MainActivity

```
//static inner class
Public static class AddTask extends Thread...
:
//class member
AddTask MyTask;
:
//start the thread
myTask.start()
```

But:

1. AddTask has an explicit reference to MainActivity
2. If you forget the static, then you have an implicit reference to enclosing activity so it cannot be GC'ed until thread exits
3. For Rotations, how do you pass thread to new activity?

# Possible Solution

## Move Thread to ViewModel

### MainActivity

```
//class member
DataVM myVM;
:
//create a new thread
//myVM will host it
myVM.mt=myVM.new AddTask(MainActivity.this)
```

### DataVM

```
// inner class
Public class AddTask extends Thread...
:
//class member
AddTask mt;
:
//start the thread
mt.start()
```

#### Good:

1. **ViewModel now hosts thread**

#### Bad

2. **When phone rotates you have to handle attaching and detaching thread to activity.**
3. **Worse, you have to verify the activity your thread uses is valid for every access.**
4. **Also, how do you avoid race conditions?**

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## Move Thread to ViewModel

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1. **ViewModel now hosts thread**

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2. **When phone rotates you have to handle attaching and detaching thread to activity.**
3. **Worse, you have to verify the activity your thread uses is valid for every access.**
4. **Also, how do you avoid race conditions?**
5. **Also DataVM.mt is heavily coupled with MainActivity**

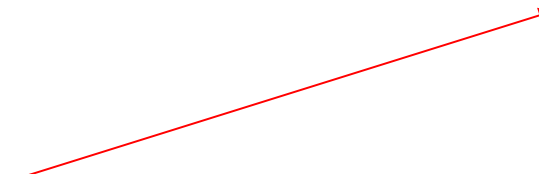
# Better Solution

## Use ViewModel and LiveData

### MainActivity

```
// Create the observer which updates the UI.
final Observer<Integer> cntrobsvr = new Observer<Integer>() {
    @Override
    public void onChanged(@Nullable final Integer newInt) {
        // Update the UI,
        progressBar.setProgress(newInt);
    }
};
//now observe
myVM.getCurrentProgress().observe( owner: this, cntrobsvr);
```

Mainactivity asks to be  
Notified when cnt changes



### DataVM

```
private MutableLiveData<Integer> cnt;
public private MutableLiveData<Integer>
    getCurrProgress(){return cnt;}
```

```
// inner class
Public class AddTask extends Thread...
{
    :
    ... run(){
        cnt.postValue(3);
    }
}
:
//class member
AddTask mt;
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//start the thread
mt.start();
```

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// Create the observer which updates the UI.
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private MutableLiveData<Integer> cnt;
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    getCurrProgress(){return cnt;}
```

// inner class

Public class AddTask extends Thread...

```
{
```

```
:
```

```
... run(){
    cnt.postValue(3);
}
```

This line updates cnt  
from the thread

```
}
```

```
:
```

//class member

```
AddTask mt;
```

```
:
```

//start the thread

```
mt.start();
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```

Which results in this  
onChanged method  
being called,  
ViewModel and LiveData  
Autohandle all MainActivity  
changes

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**PRESTO!**  
Complete decoupling  
MainActivity is updated  
whenever a change occurs

No coupling between  
ViewModel and Activity  
Everybody wins

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AsyncTask was dropped.  
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**So use a Java Thread  
Instead**

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