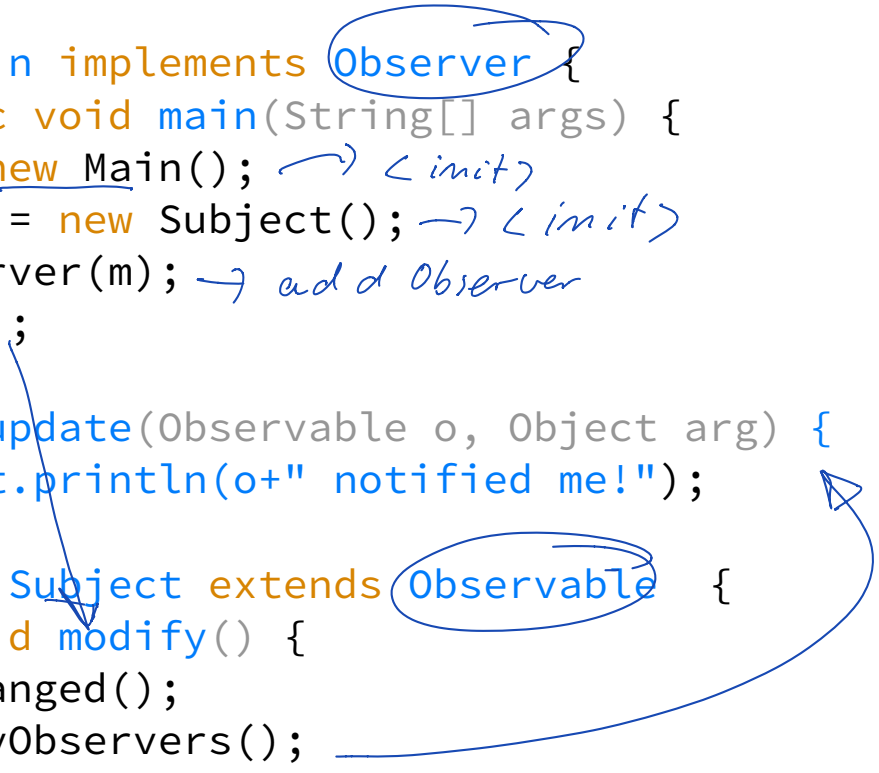
Example - Monomorphic Calls

```
public class Main implements Observer {
    public static void main(String[] args) {
        Main m = new Main();
        Subject s = new Subject();
        s.addObserver(m);
        s.modify();
    }
    public void update(Observable o, Object arg) {
        System.out.println(o+" notified me!");
    }
    static class Subject extends Observable  {
        public void modify() {
            setChanged();
            notifyObservers();
} } }
```



Example - Polymorphic Calls

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Collection c = makeCollection(args[0]);
        c.add(args[1]);
    }
    static Collection makeCollection(String s) {
        if(s.equals("list")) {
            return new ArrayList();
        } else {
            return new HashSet();
} } }
```

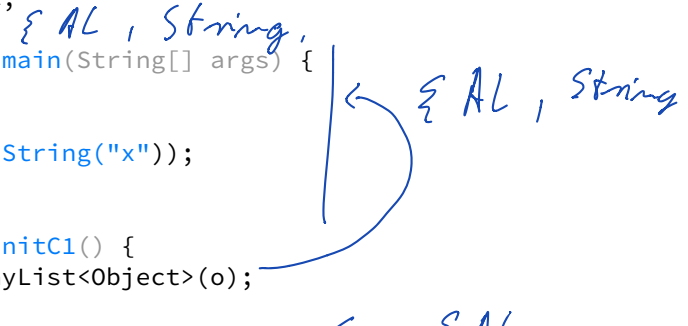
Rapid Type Analysis - example

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Collection c = makeCollection(args[0]);
        c.add("x");
        new LinkedList();
    }
    static Collection makeCollection(String s) {
        if(s.equals("list")) {
            return new ArrayList();
        } else {
            return new HashSet();
}   }   }
```

XTA - example

```
class Main {
    static Collection c;
    static Object o;
    public static void main(String[] args) {
        c = initC1();
        setO(c);
        c = initC2(new String("x"));
        process();
    }
    static Collection initC1() {
        return new ArrayList<Object>(o);
    }
    static Collection initC2(Object o) {
        List<Object> l = new ArrayList<Object>(o);
        return l;
    }
    static String setO(Object o){
        Main.o = o;
        o.toString();
    }
    static void process() {
        List<Object> l = new LinkedList<Object>();
        System.out.println(l.size());
    }
}
```



Implementation Differences and their Effect

```
Collection c1 = new LinkedList();
Collection c2;
if(some_condition){
    c2 = new ArrayList();
} else {
    c2 = new Vector();
}
c2.add(null);  // CALL SITE
```