

# Encapsulation

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# Encapsulation (1/5)

```
1  class Record{
2      String name;
3      String password;
4  }
5
6  public class RecordDemo{
7      public static void main(String [] argv){
8          Record r;
9          String s, p;
10         s = getLoginNameFromUser();
11         r = getRecordFromFile(s);
12         System.out.println(r.password);
13         p = getPasswordFromUser();
14         if (p.equals(r.password)){
15             // ...
16         }
17     }
18 }
```

- if password not encoded, the SYSOP might easily get your password by `getRecordFromFile`

# Encapsulation (2/5)

```
1  class Record{
2      String name;
3      String encoded_password;
4  }
5
6  public class RecordDemo{
7      public static void main(String [] argv){
8          Record r;
9          String s, p;
10         s = getLoginNameFromUser();
11         r = getRecordFromFile(s);
12         p = getPasswordFromUser();
13         if (YOUR_ENCODING(p).equals(r.encoded_password)){
14             // ...
15         }
16         //A new and careless programmer adds this line
17         r.encoded_password = null;
18     }
19 }
```

- even when password encoded, a careless programmer may make stupid bugs

# Encapsulation (3/5)

```
1  class Record{
2      private String encoded_password;
3      public String get_encoded_password() {
4          return encoded_password;
5      }
6  }
7  public class RecordDemo{
8      public static void main(String [] argv){
9          Record r;
10         String s, p;
11         s = getLoginNameFromUser();
12         r = getRecordFromFile(s);
13         p = getPasswordFromUser();
14         if (YOUR_ENCODING(p).equals(r.get_encoded_password())){
15             // ...
16         }
17         //A new and careless programmer adds this line
18         r.encoded_password = null; //won't work
19     }
20 }
```

- what if you want to set a new password?

# Encapsulation (4/5)

```
1  class Record{
2      String name;
3      private String encoded_password;
4      public String get_encoded_password() {
5          return encoded_password;
6      }
7      public void set_encoded_password(String raw_password){
8          if (blahblah)
9              encoded_password = YOUR_ENCODING(raw_password);
10     }
11 }
```

- **separate implementation and use:** you implement the `Record` class, and other people (possibly you after two years) use it
- **don't trust other people:** silly mistakes can happen
- **hide unnecessary details** (a.k.a. instance variables)
- **think about possible correct/incorrect use of your class:** check them in the methods

# Encapsulation (5/5)

```
1  public class RecordDemo{
2      public static void main(String [] argv){
3          Record r;
4          String s, p;
5          s = getLoginNameFromUser();
6          r = getRecordFromFile(s);
7          p = getPasswordFromUser();
8          if (r.match_password(p)){
9              //no need to show encoding to the outside
10         }
11         r.set_encoded_password(old_password, new_password);
12         //don't want this to happen
13         r.encoded_password = null;
14     }
15 }
```

- freedom on making assignments: a potential hole to do bad and/or make bugs