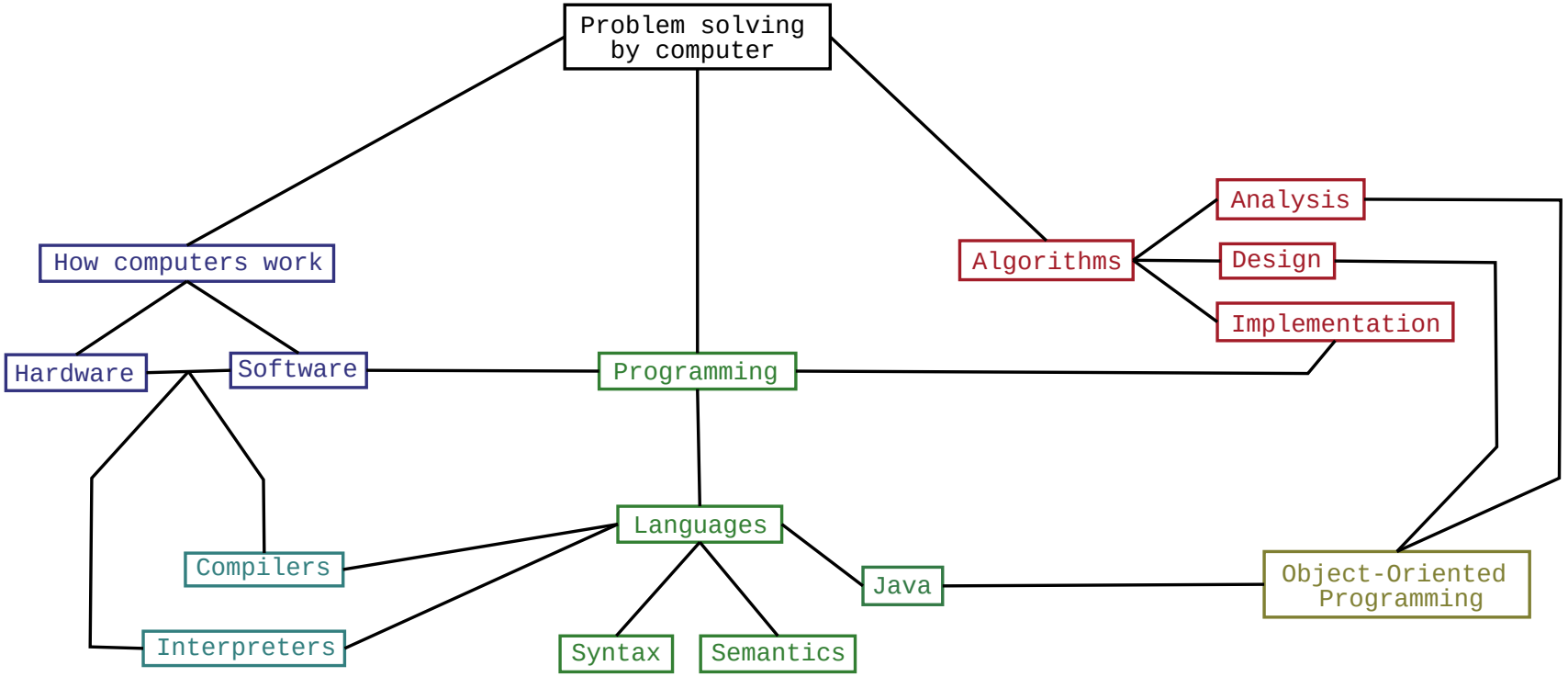
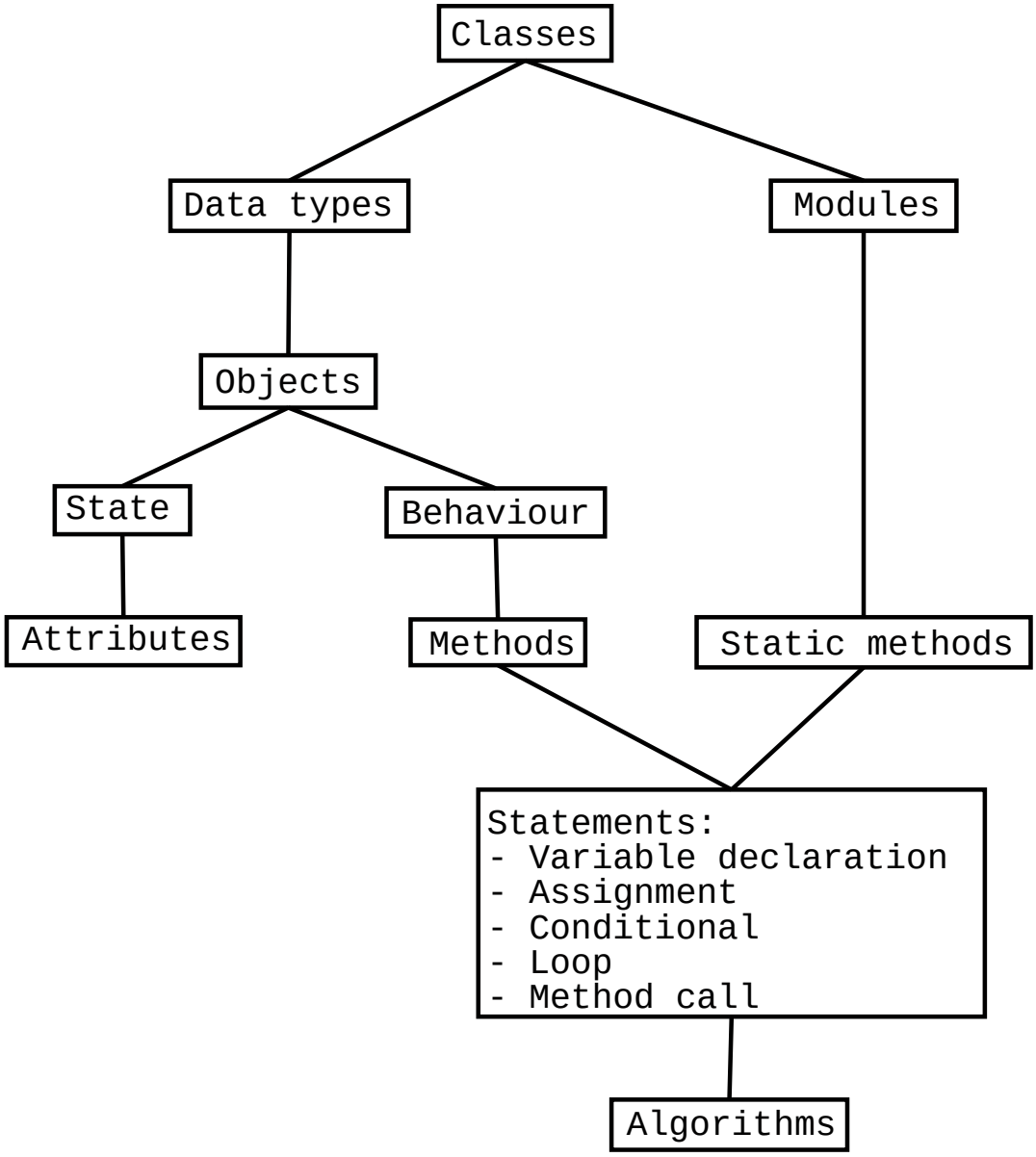
The big picture



Object-Oriented Programming



Statements

- Variable declaration

```
type variable1, variable2, ... , variablen;

int x;
boolean sunny, rainy, cloudy;
String s;
Student p;
```

- Assignment

```
variable = expression;

x = 2;
x = x * 3;
sunny = !rainy && !cloudy;
s = "hello";
p = new Student();
```

Statements (contd.)

- Conditional

```
if (boolean_expression) {
    statements;
}
```

or

```
if (boolean_expression) {
    statements1;
}
else {
    statements2;
}
```

Statements (contd.)

- Loops

```
while (boolean_expression) {
    statements;
}
```

or

```
do {
    statements;
} while (boolean_expression);
```

or

```
for (init; boolean_expression; step) {
    statements;
}
```

Statements (contd.)

- Method calls

```
variable.method_name(arg1, arg2, ..., argn);

int n = s.length();
char c = s.charAt(3);
p.compute_gpa();
```

- Static method calls

```
class_name.method_name(arg1, arg2, ..., argn);

int n = Keyboard.readInt();
double d = Math.pow(n, 3);
Student.m();
```

Classes

- Class definition

```
public class Class_name {
    Attribute_declarations;

    Method_declarations;
}
```

- Attribute declaration:

```
[modifier] [static] type variable_name;

String title;
private int age;
public static Person director;
```

Classes (contd.)

- Method declaration:

```
[modifier] [static] type method_name(type1 p1,
                                     type2 p2,
                                     ...,
                                     typen pn)
{
    statements;
}
```

Examples

```
public class Movie {
    private String title;
    private String director;
    private static int counter = 0;
    public Movie(String t, String d)
    {
        title = t;
        director = d;
        counter++;
    }
    public void change_title(String t)
    {
        title = t;
    }
    public String get_director() {
        return director;
    }
    public static int how_many()
    {
        return counter;
    }
}
```

Examples (contd.)

```
public class MovieApp {
  public static void main(String[] args)
  {
    String title = ‘‘Pirates of the Caribbean’’;
    String dir = ‘‘Jerry Bruckheimer’’;
    Movie m;
    m = new Movie(title, dir);
    m.change_title(‘‘The curse of the
                    black pearl’’);
    int n = Movie.how_many();
  }
}
```

Examples (contd.)

```
public class Person
{
    public String name;
    private int age;
    public Person(String name, int age)
    {
        this.name = name;
        this.age = age;
    }
    public void grow_up()
    {
        age++;
    }
}
```

Examples (contd.)

```
public class Movie {
    private String title;
    private Person director;
    private static int counter = 0;
    public Movie(String t, Person d)
    {
        title = t;
        director = d;
        counter++;
    }
    public void change_title(String t)
    {
        title = t;
    }
    public Person get_director() {
        return director;
    }
    public static int how_many()
    {
        return counter;
    }
}
```

Examples (contd.)

```
public class MovieApp {
  public static void main(String[] args)
  {
    String title = "Pirates of the Caribbean";
    String dir = "Jerry Bruckheimer";
    Movie m;

    Person p = new Person(dir, 157);

    m = new Movie(title, p);

    m.change_title("The curse of the
                    black pearl");
    int n = Movie.how_many();

    Person q = m.get_director();
    q.grow_up();
    System.out.println(q.name);
  }
}
```

Examples (contd.)

```
public class Movie {
    private String title;
    private static Person director;
    private static int counter = 0;
    public Movie(String t, Person d)
    {
        title = t;
        director = d;
        counter++;
    }
    public void change_title(String t)
    {
        title = t;
    }
    public Person get_director() {
        return director;
    }
    public static int how_many()
    {
        return counter;
    }
}
```

Examples (contd.)

```
public class MovieApp {
  public static void main(String[] args)
  {
    String title1 = ‘‘Pirates of the Caribbean’’;
    String dir = ‘‘Jerry Bruckheimer’’;
    Person p = new Person(dir, 157);
    Movie m1 = new Movie(title, p);

    String title2 = ‘‘Indiana Jones’’;
    Person q = new Person(‘‘Steven Spielberg’’, 201)
    Movie m2 = new Movie(title2, q);

    Person r = m1.get_director();
    System.out.println(r.name);
  }
}
```