

Exercise_1-DSA_TA_2024
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Part 1 Identifying Big-O Notation

1. $O(1)$
2. $O(n)$
3. $O(\log(n))$ Binary search
4. $O(n^2)$ Quick sort
5. $O(n^2)$ Bubble sort

Part 2 Programming

Animal.java

```
public class Animal {  
    3 usages  
    private String name;  
    3 usages  
    private int age;  
  
    1 usage new *  
    public Animal(String name, int age) {  
        this.name = name;  
        this.age = age;  
    }  
  
    1 usage new * 1 related problem  
    public String getName() { return name; }  
    no usages new *  
    public void setName(String name) { this.name = name; }  
  
    1 usage new *  
    public int getAge() { return age; }  
    no usages new *  
    public void setAge(int age) { this.age = age; }  
  
    1 usage 1 override new *  
    public void makeSound() {  
        System.out.println("An animal makes a sound");  
    }  
  
    1 usage 1 override new *  
    public void move() {
```

2. Lion.java

```

2 usages new 1 related problem
public class Lion extends Animal {

    1 usage new * 1 related problem
    public Lion(String name, int age) {
        super(name, age);
    }

    // Overriding makeSound method for Lion
    1 usage new *
    @Override
    public void makeSound() {
        System.out.println("Roarrr!");
    }

    // Overriding move method for Lion
    1 usage new *
    @Override
    public void move() {
        System.out.println("Lion jumps over the tree");
    }

    // Additional method specific to Lion
    1 usage new *
    public void hunt() {
        System.out.println("Lion is hunting");
    }
}

```

3. Main.java

```

public class Main {
    public static void main(String[] args) {
        // Creating a Lion object
        Lion lion = new Lion( name: "Farrel", age: 19);

        // Using getters to get Lion's details
        System.out.println("Name: " + lion.getName());
        System.out.println("Age: " + lion.getAge());

        // Using Lion's methods
        lion.makeSound();
        lion.move();
        lion.hunt();
    }
}

```

4. Output

```
/Library/Java/JavaVirtualMachines/jdk-21.jdk/Con
```

```
Name: Farrel
```

```
Age: 19
```

```
Roarr!
```

```
Lion jumps over the tree
```

```
Lion is hunting
```

```
Process finished with exit code 0
```