

Evidence for Implementation and Testing Unit.

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Cohort E21

I.T. 1 - Demonstrate one example of encapsulation that you have written in a program.

The hotel has an ArrayList of Rooms as a property, which has been made private.

```
public class Hotel {  
    private ArrayList<Room> allRooms;  
  
    public Hotel(ArrayList<Room> allRooms){  
        this.allRooms = allRooms;  
    }  
}
```

I.T. 2 - Example the use of Inheritance in a program.

Room is an Abstract Superclass

```
public abstract class Room {  
    private int capacity;  
    private ArrayList<Guest> guests;  
  
    public Room(int capacity, ArrayList<Guest> guests){  
        this.capacity = capacity;  
        this.guests = guests;  
    }  
  
    public int getCapacity(){  
        return this.capacity;  
    }  
}
```

Bedroom class inherits from Room class

```
public class Bedroom extends Room {  
    private int roomNumber;  
    private BedroomType type;  
    private double nightlyRate;  
  
    public Bedroom(int capacity, ArrayList guests, int roomNumber, BedroomType type, double nightlyRate){  
        super(capacity, guests);  
        this.roomNumber = roomNumber;  
        this.type = type;  
        this.nightlyRate = nightlyRate;  
    }  
}
```

Bedroom object inheriting properties from Room

```
guest = new Guest( name: "Antoin");
guests = new ArrayList();
bedroom = new Bedroom( capacity: 2, guests , roomNumber: 1, BedroomType.DOUBLE, nightlyRate: 80.00);
```

Able to get the capacity of the bedroom using the method getCapacity() inherited from Room class (seen in first screenshot)

```
@Test
public void canGetCapacity(){
    assertEquals( expected: 2, bedroom.getCapacity());
}
```

I.T. 3 - Example of Searching.

A function to search for an animal by its ID, followed by the function running in the terminal.

```
def self.find(id)
  sql = "SELECT * FROM animals
  WHERE id = $1"
  values = [id]
  result = SqlRunner.run(sql, values).first
  animal = Animal.new(result)
  return animal
end
```

```
[3] pry(main)> Animal.find(3)
=> #<Animal:0x007faca465b898
  @admission_date="December 2017",
  @adoptable=true,
  @adopted=true,
  @id=3,
  @name="Django",
  @type="Hamster",
  @url=
    "http://absfreepic.com/absolutely_free_photos/small_photos/cute-
hamster-with-yellow-hair-2516x1667_93382.jpg">
```

I.T. 4 - Example of Sorting.

A function to find all animals that are ready for adoption, followed by the function running in terminal.

```
def self.ready_for_adoption()
  sql = "SELECT * FROM animals WHERE adoptable = 't' AND
  adopted = 'f'"
  animal_data = SqlRunner.run(sql)
  animals = map_items(animal_data)
  return animals
end
```

```

l4j pry(main)> Animal.ready_for_adoption
=> [#<Animal:0x007faca4623038
  @admission_date="April 2018",
  @adoptable=true,
  @adopted=false,
  @id=5,
  @name="Beyonce",
  @type="Giant Rabbit",
  @url=
    "http://flemish-giant.com/wp-content/uploads/2015/10/Flemish-Gi
ant-Rabbit-Light-Grey.jpg">,
  #<Animal:0x007faca4622e80
  @admission_date="February 2018",
  @adoptable=true,
  @adopted=false,
  @id=6,
  @name="Pinky",
  @type="Cat",
  @url=
    "https://www.pets4homes.co.uk/images/breeds/23/large/3514efe61d
990b82bbc37bed0eea52a.jpg">,
  #<Animal:0x007faca4622cc8
  @admission_date="May 2018",
  @adoptable=true,
  @adopted=false,
  @id=7,
  @name="Monkey",
  @type="Guinea Pig",
  @url=
    "https://www.petmd.com/sites/default/files/guide-to-guinea-pigs
.jpg">,
  #<Animal:0x007faca4622b10
  @admission_date="April 2018",
  @adoptable=true,
  @adopted=false,
  @id=8,
  @name="Edgar",
  @type="Rat",
  @url=
    "https://thumbor.forbes.com/thumbor/960x0/https%3A%2F%2Fblogs-i
mages.forbes.com%2Fjudystone%2Ffiles%2F2018%2F02%2Fhantavirus-mous
e-cdc.jpg">]

```

I.T. 5 - Example of an array, a function that uses the array and the result

Array of fish in a river

```

fish = ["Salmon", "Goldfish", "Zebra"]
@river = River.new("Chilko", fish)

```

Function using the array

```

def number_of_fish_in_river
  @fish.length
end

```

Testing the function

```

def test_count_fish_in_river
  assert_equal(3, @river.number_of_fish_in_river)
end

```

1 runs, 1 assertions, 0 failures, 0 errors, 0 skips

I.T. 6 - Example of a hash, a function that uses the hash and the result

```
users = {  
  "Jonathan" => {  
    :twitter => "jonnyt",  
    :lottery_numbers => [6, 12, 49, 33, 45, 20],  
    :home_town => "Stirling",  
    :pets => [  
      {  
        :name => "fluffy",  
        :species => "cat"  
      },  
      {  
        :name => "fido",  
        :species => "dog"  
      },  
      {  
        :name => "spike",  
        :species => "dog"  
      }  
    ]  
  }  
}
```

```
p users["Jonathan"][:pets][2][:name]
```

```
[→ homework_day3 git:(master) ✕ ruby arrays_and_hashes.rb  
"spike"
```

I.T. 7 - Example of polymorphism in a program

Piano class inherits from Instrument class

```
public class Piano extends Instrument{  
  private String size;  
  
  public Piano(String type, String colour, double priceBought, double priceSell, String size){  
    super(type, colour, priceBought, priceSell);  
    this.size = size;  
  }  
}
```

Instrument superclass implements the interfaces IPlay and ISell

```

public abstract class Instrument implements IPlay, ISell {
    private String type;
    private String colour;
    private double priceBought;
    private double priceSell;

    public Instrument(String type, String colour, double priceBought, double priceSell){
        this.type = type;
        this.colour = colour;
        this.priceBought = priceBought;
        this.priceSell = priceSell;
    }
}

```

The piano can be considered as a piano, an instrument, an iPlay object or an iSell object. In the method below, it is being passed in as an iSell object, and added to the ArrayList called stock, which can contain different items including other instruments, and other music shop products.

```

public void buy(ISell iSell){
    this.funds -= iSell.getPriceBought();
    this.addItemToStock(iSell);
}

```

```

@Test
public void canSellItem(){
    shop.addItemToStock(piano);
    shop.addItemToStock(piano);
    shop.sell(piano);
    assertEquals( expected: 1, shop.getStockCount());
    assertEquals( expected: 1400, shop.getFunds(), delta: 0.1);
}

```