Evidence for Implementation and Testing Unit

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

```
public abstract class Fish {

    String species;

    public Fish(String colour){
        this.species = species;
    }

    public String getSpecies(){
        return this.species;
    }
}
```

I. T. 2 Example the use of inheritance in a program

1) Parent class

```
import java.util.ArrayList;

public abstract class Room {
    private ArrayList<Guest> guests;
    private int capacity;

    public Room(int capacity) {
        this.capacity = capacity;
        this.guests = new ArrayList<Guest>();
    }

    public int getCapacity() {
        return this.capacity;
    }

    public int numberOfPeople() {
        return this.guests.size();
    }

    public boolean isFull() {
        return this.guests.size() == this.capacity;
    }

    public void checkIn(Guest guest) {
        if (this.guests.size() < this.capacity) {
            this.guests.add(guest);
        }
    }

    public ArrayList<Guest> getGuests() {
        return new ArrayList<>(guests);
    }
}
```

2) Child class ‘Bedroom’ inherits from parent class ‘Room’.

```
public class Bedroom extends Room {
    private int numberOfGuests;
    private double price;

    public Bedroom(int numberOfGuests, double price) {
        super(type.getCapacity());
        this.numberOfGuests = numberOfGuests;
        this.price = price;
    }

    public int getNumberOfGuests() {
        return this.numberOfGuests;
    }

    public String getType() {
        return this.type.getType();
    }

    public double getPrice() {
        return this.price;
    }
}
```

3) Screenshot of room test

```
import org.junit.Test;

import static org.junit.Assert.assertEquals;

public class TestRoom {
    private Room room1;

    @Before
    public void before(){
    room1 = new Room(7);
    }

    @Test
    public void hasCapacity(){assertEquals (7, room1.getCapacity()); }
```

I. T. 3 Example of searching (if you do not have a search or sort algorithm, write one up and take a screenshot. Remember to include the results as well)

```
...y (ruby) ⌘1  ...(node) ⌘2  ...(java) ⌘3  ...(nano) ⌘4  ...ds (zsh) ⌘5
  GNU nano 2.0.6          File: seaching_algorithm.rb

def fruit_algorithm(array, individual_fruit)
  fruits = array.map { |fruit| fruit}
  fruits.include?(individual_fruit) ? true : false
end

produce = ["apple", "pear", "banana", "kiwi", "grape"]

puts fruit_algorithm(produce, "pear")
puts fruit_algorithm(produce, "melon")
```

```
➜  pda_evidence git:(master) ✗ ruby seaching_algorithm.rb
true
false
```

I. T. 4 Example of sorting

```ruby
random_numbers = [74, 10, 66, 31, 2, 80, 591, 1, 9]
def sorting_algorithm(array)
  array.sort{|a, b| a <=> b }
end

p "These are the random numbers: #{random_numbers}"
p "These are the sorted numbers: #{sorting_algorithm(random_numbers)}"
```

```
➜  pda_evidence git:(master) ✗ ruby sorting_algorithm.rb
"These are the random numbers: [74, 10, 66, 31, 2, 80, 591, 1, 9]"
"These are the sorted numbers: [1, 2, 9, 10, 31, 66, 74, 80, 591]"
```

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

```ruby
names = ["joe", "matt", "mike", "rick"]

def names_in_array(array)
  for name in array
    p "Hello, my name is #{name}"
  end
end

p names_in_array(names)
```

```
➜ pda_evidence git:(master) ✗ ruby array_algorithm.rb
"Hello, my name is joe"
"Hello, my name is matt"
"Hello, my name is mike"
"Hello, my name is rick"
```

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

```ruby
bands = [
  {
    name: "The Beatles",
    members: 5,
    origin: "Liverpool"
  },
  {
    name: "The Roots",
    members: 8,
    origin: "Philadelphia"
  },
  {
    name: "The Proclaimers",
    members: 2,
    origin: "Edinburgh"
  }
]

def all_artists(hash)
  artists = 0
  for band in hash
    p "#{band[:name]} are from #{band[:origin]} and have #{band[:members]} members"
    artists += band[:members]
  end
  return "Together, there are a total of " + artists.to_s + " artists"
end

p all_artists(bands)
```

```
➜  pda_evidence git:(master) ✗ ruby hash_algorithm.rb
"The Beatles are from Liverpool and have 5 members"
"The Roots are from Philadelphia and have 8 members"
"The Proclaimers are from Edinburgh and have 2 members"
"Together, there are a total of 15 artists"
```

I. T. 7 Example of polymorphism in a program

```java
public interface Playable {
    boolean canBePlayed();
}
```

```java
public class Guitar implements Playable {
    String name;

    public Guitar(boolean madeOfWood, String cost, int year, String name) {
        this.name = name;
    }

    @Override
    public boolean canBePlayed() {
        return true;
    }
}
```

```java
public class Flugelhorn implements Playable {
    String name;

    public Flugelhorn(boolean madeOfWood, String cost, int year, String name) {
        this.name = name;
    }

    @Override
    public boolean canBePlayed() {
        return true;
    }
}
```

```java
import Interfaces.Playable;
import java.util.ArrayList;

public class MusicShop {

  private ArrayList<Playable> playables;

  public MusicShop(ArrayList playables){
    this.playables = playables;
  }

  public ArrayList<Playable> getPlayable() {
    return playables;
  }

}
```