Douglas Sangster – Implementation & Testing Unit (PDA)

- I.T. 1 – Use of Encapsulation

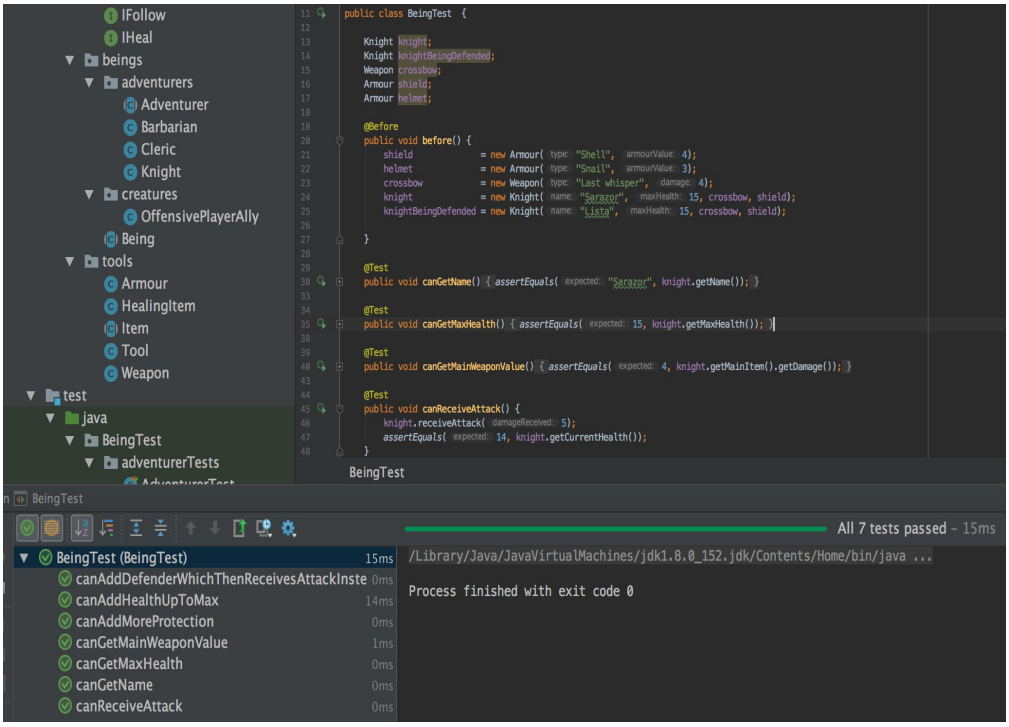
```java
public class Card implements Serializable {


    private CardName        name;
    private FactionColour   colour;
    private int             imageBlueViewInt;
    private int             imageRedViewInt;
    private HashMap<Integer, ArrayList<Coordinate>> moveset;


    public Card(CardName name, FactionColour colour, int imageBlueViewInt, int imageRedViewInt, HashMap<Integer, ArrayList<Coordinate>> moveset) {

        this.name               = name;
        this.colour             = colour;
        this.imageBlueViewInt   = imageBlueViewInt;
        this.imageRedViewInt    = imageRedViewInt;
        this.moveset            = moveset;
    }

    public CardName getName() {

        return name;
    }

    public FactionColour getCardColour() {

        return this.colour;
    }

    public int getImageBlueViewInt(){

        return this.imageBlueViewInt;
    }

    public int getImageRedViewInt(){

        return this.imageRedViewInt;
    }
```

- I.T. 2 – Use of Inheritance

```java
public abstract class Being {

    private String name;
    private int maxHealth;
    private int currentHealth;
    protected IDefend defender;
    protected ArrayList<IAbsorb> protection;


    public Being(String name, int maxHealth) {
        this.name           = name;
        this.maxHealth      = maxHealth;
        this.currentHealth  = maxHealth;
        this.protection     = new ArrayList<>();
    }


    public void receiveAttack(int damageReceived){
        if(defender != null){
            ((Being) defender).receiveAttack(damageReceived);
        } else {
            for(IAbsorb element: protection){
                damageReceived = element.block(damageReceived);
            }
            takedamage(damageReceived);
        }
    }

    public String getName() { return name; }

    public int getMaxHealth() { return this.maxHealth; }

    public int getCurrentHealth() { return this.currentHealth; }
```

```java
public abstract class Adventurer<T> extends Being {


    protected T mainItem;

    public Adventurer (String name, int maxHealth, T mainItem) {
        super(name, maxHealth);
        this.mainItem = mainItem;
    }

    public abstract void useMainItem(Being target);

    public T getMainItem(){
        return this.mainItem;
    }

    public void wieldItem(T newMainItem) {
        this.mainItem = newMainItem;
    }
}
```

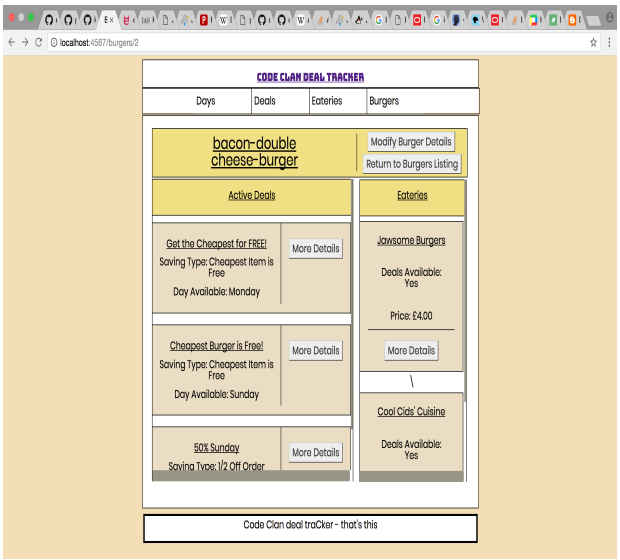
```java
public class Knight extends Adventurer<Weapon> implements IDefend {


    private Being beingUnderProtection;


    public Knight(String name, int maxHealth, Weapon mainWeapon, Armour shield) {
        super(name, maxHealth, mainWeapon);
        this.protection.add(shield);
    }

    public void useMainItem(Being target) {
        this.mainItem.dealDamage(target);
    }

    public void defend(Being target){
        if(this.defender != null){
            this.defender.stopDefending();
        }

        if(beingUnderProtection != null) {
            beingUnderProtection.removeDefender();
        }

        beingUnderProtection = target;
        target.addDefender(this);
    }

    public void stopDefending(){
        beingUnderProtection.removeDefender();
        beingUnderProtection = null;
    }
```

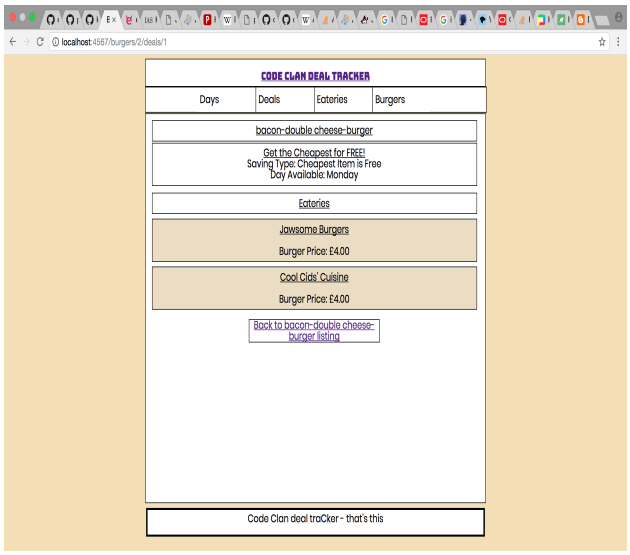


- I.T. 3 – Searching Data

```ruby
def Eatery.find_by_burger_deal(options)
  sql = "
  SELECT eateries.id, eateries.name
  FROM eateries INNER JOIN active_deals ON
  active_deals.eatery_id = eateries.id WHERE
  active_deals.burger_id = $1 AND
  active_deals.deal_id = $2;
  "
  burger_id = options['burger'].to_i
  deal_id = options['deal'].to_i
  values = [burger_id, deal_id]
  eatery_hashes = SqlRunner.run(sql, values)
  return mapper_aid(eatery_hashes)
end
```

```
get('/burgers/:burger_id/deals/:deal_id')
do
  burger_id = params['burger_id'].to_i
  deal_id = params['deal_id'].to_i
  @burger = Burger.find(burger_id)
  @deal = Deal.find(deal_id)
  @eateries =
  Eatery.find_by_burger_deal({'burger' =>
  burger_id , 'deal' => deal_id})
  erb(:"burgers/deals/show")
end
```

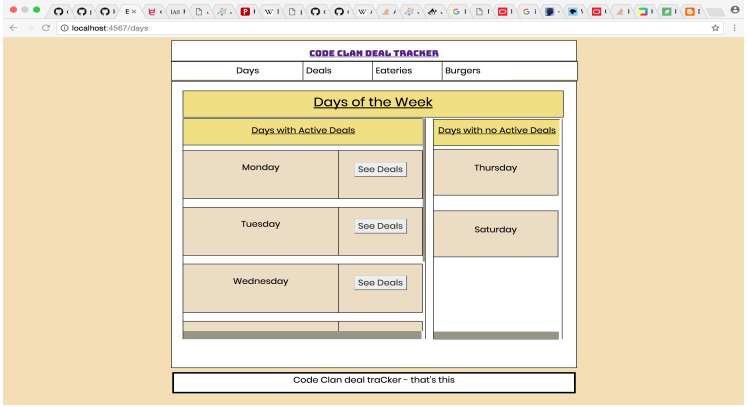




- I.T. 4 – Sorting Data

```
def Day.find_all_active
  sql = "
  SELECT DISTINCT days.id, days.day FROM
  days INNER JOIN
  deals ON days.id = deals.day_id INNER
  JOIN
  active_deals ON deals.id =
  active_deals.deal_id
  ORDER BY days.id ASC;
  "
  day_hashes = SqlRunner.run(sql)
  return mapper_aid(day_hashes)
end
```

```
get('/days') do
  @active_days = Day.find_all_active
  @inactive_days = Day.find_all_inactive
  erb(:"days/index")
end
```



- I.T. 5 – Use of an Array

```
public Deck(){
    cards = new ArrayList<>();
    createDeck();
}

private void createDeck() {
    Suit[] suits = Suit.values();
    Rank[] ranks = Rank.values();
    int indexSuit;
    int indexRank;
    for (indexSuit = 0; indexSuit < suits.length; indexSuit += 1) {
        for (indexRank = 0; indexRank < ranks.length; indexRank += 1) {
            Card card = new Card(suits[indexSuit], ranks[indexRank]);
            cards.add(card);
        }

    }
}


public int getSize() {
    return this.cards.size();
}
```

```
@Before
public void before(){
    deck = new Deck();  deck: Deck@832
    player = new Player( name: "Colin");  player: null
    dealer = new Dealer( name: "Joker");
}

@Test
public void deckHas52Cards(){
    assertEquals( expected: 52, deck.getSize());
}
```

DeckTest › before()

riables

this = {DeckTest@827}
deck = {Deck@832}
cards = {ArrayList@841} size = 52

- I.T. 6 – Use of a Hash

```
public HashMap<Player,GameResultType> decideResult(Player player1, Player player2) {
    HashMap<Player, GameResultType> outcome;
    outcome = new HashMap<>();
    if (player1.getHandValue() == player2.getHandValue()){
        outcome.put(player1, GameResultType.DRAW);
        outcome.put(player2, GameResultType.DRAW);
    } else if (player1.getHandValue() > player2.getHandValue()){
        outcome.put(player1, GameResultType.WIN);
        outcome.put(player2, GameResultType.LOSE);
    } else {
        outcome.put(player1, GameResultType.LOSE);
        outcome.put(player2, GameResultType.WIN);
    }

    return outcome;
}
```

```
    adjudicationResultHash = adjudicator.decideResult(this.playerHuman, this.playerComputer);
    GameResultType playerHumanResult = adjudicationResultHash.get(this.playerHuman);

    if (playerHumanResult.equals(GameResultType.DRAW)){
        resultString = "The game is a draw!";
    } else if (playerHumanResult.equals(GameResultType.WIN)) {
        resultString = "You won the game!";
    } else {
        resultString = String.format("You lost the game, %s had a better hand.", opponentName);
    }

    System.out.println(resultString);
}
```

```
classes — java Runner — java — java — 80×24
Your hand has a value of 19, Alex's hand has a value of 11.

You won the game!


Start another game?
(Y)es/(N)o:
```

- I.T 7 – Use of Polymorphism

```java
public class Stock {

    private ArrayList<SaleItem>     inventory;

    public Stock(){

        this.inventory              = new ArrayList<>();

    }


    public int getInventorySize() { return this.inventory.size(); }

    public void addInventory(SaleItem... items) { this.inventory.addAll(Arrays.asList(items)); }

    public void addInventory(ArrayList<SaleItem> items) { this.inventory.addAll(items); }

    public ArrayList<SaleItem> getInventory() {
        ArrayList<SaleItem> copyInventory = new ArrayList<>();

        copyInventory.addAll(this.inventory);

        return copyInventory;
    }
```

```java
public class StockTest {


    private Stock stock;

    private StringedInstrument  guitar;
    private Woodwind            saxophone;
    private KeyboardInstrument  piano;

    private NonInstrument       book;
    private NonInstrument       sticks;
    private NonInstrument       amp;

    private ArrayList<SaleItem> exampleStock;

    @Before
    public void before(){

        stock = new Stock();


        guitar      = new StringedInstrument( wholesalePrice: 3,  salePrice: 6,  name: "Model-MTC2",
                InstrumentMaterial.WOOD, InstrumentType.GUITAR,
                InstrumentMake.FENBAR,  numberOfStrings: 6);

        saxophone   = new Woodwind( wholesalePrice: 5, salePrice: 8,  name: "Y8-HF3",
                InstrumentMaterial.BRASS, InstrumentType.SAXOPHONE,
                InstrumentMake.ZELMIRE,  numberOfToneHoles: 6);

        piano       = new KeyboardInstrument( wholesalePrice: 10,  salePrice: 14,  name: "YT384-Piano",
                InstrumentMaterial.WOOD, InstrumentType.PIANO,
                InstrumentMake.BARTOLO,  numberOfKeys: 88);


        book        = new NonInstrument( wholesalePrice: 3,  salePrice: 7,  name: "Learn All Music",
                NonInstrumentType.BOOK, NonInstrumentMake.OMNIRS);

        sticks      = new NonInstrument( wholesalePrice: 1,  salePrice: 4,  name: "BeatTheBest(tm)",
                NonInstrumentType.DRUMSTICK, NonInstrumentMake.FACTOR);

        amp         = new NonInstrument( wholesalePrice: 4,  salePrice: 5,  name: "PH-45-AMP",
                NonInstrumentType.AMPLIFIER, NonInstrumentMake.LARK);


        exampleStock =  new ArrayList<>(Arrays.asList(guitar, book, piano, amp));
    }
```

```
    sticks      = new NonInstrument( wholesalePrice: 1,  salePrice: 4,  name: "BeatTheBest(tm)",
            NonInstrumentType.DRUMSTICK, NonInstrumentMake.FACTOR);

    amp         = new NonInstrument( wholesalePrice: 4,  salePrice: 5,  name: "PH-45-AMP",
            NonInstrumentType.AMPLIFIER, NonInstrumentMake.LARK);


    exampleStock =  new ArrayList<>(Arrays.asList(guitar, book, piano, amp));
}



@Test
public void canGetStockSize() { assertEquals( expected: 0, stock.getInventorySize()); }

@Test
public void canAddOneItemToStock(){
    stock.addInventory(guitar);
    assertEquals( expected: 1, stock.getInventorySize());
}

@Test
public void canAddMultipleItemsToStockCommaSeparated(){
    stock.addInventory(guitar, sticks, saxophone);
    assertEquals( expected: 3, stock.getInventorySize());
}

@Test
public void canAddMultipleItemsToStockInSimpleArray(){
    SaleItem[] items = {guitar, book, piano, amp};
    stock.addInventory(items);
    assertEquals( expected: 4, stock.getInventorySize());
}

@Test
public void canAddMultipleItemsToStockInArrayList(){
    stock.addInventory(exampleStock);
    assertEquals( expected: 4, stock.getInventorySize());
}
```