**Due Date:** Tuesday, October 30, 2018 @ 11:59 PM

**Lab Objectives:**

* Use selection and looping based flow control in program design
* Practice developing classes and writing methods.

**Book Material Covered:**

* Chapter 4 – 7

**To complete this assignment:**

* Check out the proj02 directory from your SVN repository:  
  https://csprojects.cs.ndsu.nodak.edu/csci160/2018/fall/svn/username/proj02
* Read through all instructions and look over the assignment and make a quick mental estimate of how much time you expect proj02 to take you to complete. You should record this initial estimate in the proj02 Questions document.
* Fill out the Game Design form at the bottom of the Questions document. This will be checked by the grader for matching features in your game.
* Create a functional implementation of your version of the Camel game based on the instructions below, optionally using the recommended APIs provided.
* Commit your code to the SVN repository.
* Complete the Blackboard portion of the assignment by answering the questions listed at the top of the proj02 Questions Word document.

**Grading:**

Questions 5 Turning in the Blackboard Questions

Style / Formatting 25 Using proper style, formatting, and identifiers for your code

Commenting 15 Including good comments in your code

Class Design 20 Using a good object oriented approach for your project

Implementation 80 Points given for the italicized portions below

Game Design Form 5 Document describing the features you decided to include

Total 150

**Instructions:**

For this assignment you will be creating a Java program that allows users to play a video game based on the concept of Camel, a text-based game originally developed in 1979 using BASIC (<http://www.atariarchives.org/morebasicgames/showpage.php?page=24>). In the game, the player is attempting to race to safety across the desert on a stolen camel with natives chasing them, a limited water supply, and a variety of conditions that can befall them on their trip.

The API for the sample game described in this document has been included on Blackboard as a reference. You are allowed to base your solution on this sample game if you’d like, but you have the flexibility to create your own game following the same pattern as well. For example, you could create a game themed around escaping a zombie apocalypse or trying to become a Pokemon master. The specific attributes your game **must have** are listed *in italics*.

Your game needs *at least two different classes* that represent important game entities. In the sample game, these are the camel and the rider. These should be implemented as actual classes in your program. Each class should have *at least three resources*. In the sample game, Rider has a hunger, energy, and thirst and Camel has hunger, energy, and thirst. It is not necessary for these resources to be similar and could be completely mutually exclusive. These resources should have a value range (in the sample game, 0 – 15 is used for each resource with 0 representing low values resulting in death and 15 being a maximum to prevent over stockpiling) and should be described to the player using text descriptions rather than given as raw numbers. For example, a hunger resource in the range 2 – 5 might be reported to the player as "hungry".

The game should have *a goal of some kind*. In the sample game, the rider and camel need to make it 200 miles before the natives catch up to them. It is best if whatever you choose is a number that can increment upwards towards the goal. There should also be some way of losing based on the progress of this goal. In the sample game this happens if your pursuers catch up to you before reaching the goal. In your game this could be if your opponent manages to collect 500 pogs before your game entity does or if you fail to raise enough money save an orphanage within 20 days.

You must include *at least three different conditions that will change randomly (or on a cycled schedule, if that makes more sense) during each turn*. In the example game, this includes the weather (which is determined randomly), location (which is also determined randomly), and time of day (which runs on a cycle – Morning, Afternoon, Evening, Night, then Morning again).

You must include *at least 6 menu options related to acquiring resources or progressing towards the goal* during actual game play. Choosing one of these should modify your resources (some may go down while others are increased in response) or progress towards your goal in some way. **All input must be type and value safe.** During a turn in the sample game, the player chooses between resting, searching for food, searching for water, traveling carefully, traveling regularly, and riding hard. Searching for food or water spend rider resources to have a random chance at increasing resources for the rider and camel. The travel options spend resources for the camel to move the player closer to the goal.

The options selected from the menu should have some random element as well as outcomes based on the *three conditions* that you have created. As an example, in the sample game trying to ride all out in extremely hot weather will seriously deplete the camel's resources and it is easier to find food when in the ruins location. You should include at least *20 adjustments to outcomes* based on your *three conditions*. You should output some text to the user as these adjustments occur to help them understand why they are happening which will allow them to become better at the game as they play through it multiple times.

*You must be able to win or lose the game based on reaching your goal or running out of resources.* In the example game, you win by making it 200 miles. You lose when you die (of starvation, thirst, or the natives catching up to you). Whenever the game is won or lost, it should output some information about what has happened to player and then ask the player if they would like to start a new game, which would start the entire process over again.

At the start of your game, you must *create a menu that allows the player to select the difficulty of the game that affects resource gathering and random events later in the game*. You should also *be able to customize your game entities with a name and starting resource level*. Again, a**ll input must be type and value safe.**

**Other Game Ideas:**

It is not required that you use the same style of game suggested above. You may want to try implementing something else. Consider the following examples:

* Rick and Morty theme – Rick and Morty entities trying to collect 3000 Flurbos
* Star Wars theme – Han Solo and the Millennium Falcon entities escaping the law
* Pokemon theme – Ash and Pikachu game entities trying to capture all 150 pokemon
* Computer theme – Hacker and Computer entities trying to steal secret documents
* Oregon Trail theme – Pioneer and Cart entities trying to avoid dying of dysentery
* Desert Bus theme – Driver and Bus entities trying not to die of boredom

**Where to Start:**

It is suggested that you start by designing your game by filling out the game design form with your particular game in mind. Even if you plan on following the sample game, it will be helpful to list the features the game will have. Once you have finished the form, start by creating your game entities as classes, including resources as instance variables. You can then implement the game logic in a main method. You may find it useful to create a separate Game and Main class, where the Main class simply creates an object of type Game and calls the start method.

It is also useful to have a general plan for how resources will be acquired and spent based on the different options chosen by the player. You may want to create a rough outline of how much each action will cost and how much can be gained. It will likely be necessary for you to tune these values based on game play, but you may want to do some initial work to ensure that the values you have chosen make it both possible to win and lose the game.

You may want to create a large number of private or public helper methods that solve smaller problems (e.g. check if the game is won, display a menu, perform a menu option, etc.) that you can call later instead of attempting to think of everything as one big problem. Look for areas where you are rewriting the same code multiple times as that usually indicates you should be creating a helper method to perform that functionality instead. One example of this helper method functionality (MenuHelper) has been included as an API document. Note that some methods in the various API documents are marked static and some are just (nonstatic) methods.

Learning to use the debugger will also be a big help in this assignment as testing your code can be difficult and the debugger will allow you to step through your code at your own pace or modify variables during runtime so you can pin-point logic errors. You may want to use the debugger learning object on the SEP-CyLE website to help you get started with using the debugger.

**Comments:**

Because this program is likely to be quite large and involve complex logic, you should include comments to help document your code. You may want to consider including Javadoc code for your game entity classes to provide a greater amount of description about them and how their resources work.

In general, you should try to have comments for blocks of code that have more than 5 or 6 lines of code in them. It isn't necessary to provide a detailed description of what ever line does, but you should indicate what purpose the following code serves. For example, a comment like "adjust outcomes for finding food based on time of day and location" is sufficient to indicate what the code is doing and to help you find that section of code quickly if you need to make changes to it in the future.

Another good rule to follow is that when writing a method that if it starts to become exceptionally long, that you should split it into multiple smaller methods. If you give your methods good identifiers, this can reduce the need for extensive comments.

**Challenges:**

Although it is not required of you to do so, you may want to see if you can implement one or more of the following features:

* Keep a record of a player’s quickest trip across the desert while winning or losing
* Keep a record of a player’s longest trip across the desert while winning or losing.
* Allow your Camel to die and force the player to continue walking
* Give points after winning the game for resources still available
* Add additional random events that can occur in certain situations that add additional options to the possible actions a player can take in the menu.
* Add in some form of mini-game that the player occasionally must engage in such as being able to fight off the pursuers if they get too close to avoid losing the game.

**Sample Output:**

Welcome to Desert Escape!

Please select a difficulty:

1) Easy

2) Normal

3) Hard

4) Challenging

Please enter a selection 1 - 4: 5

Please enter a selection 1 - 4: No You!

Please enter a selection 1 - 4: 2

What type of camel would you like to use:

1) Standard

2) Random

3) Custom

Please enter a selection 1 - 3: 3

Please enter a name for your camel: Superbob

Please enter an initial thirst level for the camel with 1 being extremely thirsty.

Please enter a selection 1 - 15: 15

Please enter an initial hunger level for the camel with 1 being extremely hungry.

Please enter a selection 1 - 15: 9

Please enter an initial energy level for the camel with 1 being extremely tired

Please enter a selection 1 - 15: 12

What type of rider would you like to use:

1) Standard

2) Random

3) Custom

Please enter a selection 1 - 3: 2

Please enter your name: Steve

After a long night's ride you have escaped the city with the sacred Macguffin and rode out into the desert.

By now the royal guards have set after you in pursuit. You must escape across the desert.

Day: 1 Distance Traveled: 20 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Morning Location: Desert Plains Weather: Warm

Rider Status: Camel Status:

Thirst: Well Hydrated Thirst: Quenched

Hunger: Satiated Hunger: Satiated

Energy: Fresh Energy: Invigorated

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 5

Your path is obstructed and you must spend some time clearing it

You travel throughout the Morning and cover 12 miles.

Day: 1 Distance Traveled: 32 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Afternoon Location: Desert Plains Weather: Warm

Rider Status: Camel Status:

Thirst: Parched Thirst: Quenched

Hunger: Hungry Hunger: Satiated

Energy: Fresh Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 5

You travel throughout the Afternoon and cover 11 miles.

Day: 1 Distance Traveled: 43 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Evening Location: Desert Plains Weather: Warm

Rider Status: Camel Status:

Thirst: Parched Thirst: Well Hydrated

Hunger: Hungry Hunger: Hungry

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 3

You are unable to find any water

Day: 1 Distance Traveled: 43 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Night Location: Desert Hills Weather: Raining

Rider Status: Camel Status:

Thirst: Parched Thirst: Well Hydrated

Hunger: Hungry Hunger: Hungry

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 1

You decide to rest for the remainder of the Night.

The rain makes it more difficult for you to sleep, but you are able to collect some water for you and your camel

Day: 2 Distance Traveled: 43 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Morning Location: River Bank Weather: Cloudy

Rider Status: Camel Status:

Thirst: Parched Thirst: Quenched

Hunger: Hungry Hunger: Satiated

Energy: Fresh Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 6

Your camel is able to make good progress due to the cooler weather.

Your camel fells tired from the strenuous pace and pauses to take a break.

You travel at a breakneck pace throughout the Morning and cover 22 miles.

Day: 2 Distance Traveled: 65 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Afternoon Location: Desert Plains Weather: Extremely Hot

Rider Status: Camel Status:

Thirst: Parched Thirst: Well Hydrated

Hunger: Starving Hunger: Hungry

Energy: Fresh Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 2

You spend the Afternoon searching for food.

The extreme heat of the day beats down upon you during your search.

You are unable to find anything to eat.

Day: 2 Distance Traveled: 65 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Evening Location: River Bank Weather: Warm

Rider Status: Camel Status:

Thirst: Very Thirsty Thirst: Well Hydrated

Hunger: Starving Hunger: Hungry

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 2

You spend the Evening searching for food.

You find some food amidst the desert plants.

Day: 2 Distance Traveled: 65 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Night Location: Desert Plains Weather: Warm

Rider Status: Camel Status:

Thirst: Very Thirsty Thirst: Well Hydrated

Hunger: Satiated Hunger: Satiated

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 3

You are unable to find any water

Day: 3 Distance Traveled: 65 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Morning Location: Oasis Weather: Warm

Rider Status: Camel Status:

Thirst: Very Thirsty Thirst: Well Hydrated

Hunger: Satiated Hunger: Satiated

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 3

You find plenty of water for you and your camel at the Oasis

Day: 3 Distance Traveled: 65 Pursuer Distance: Your pursuers are within a day's ride of you.

Time: Afternoon Location: Desert Hills Weather: Warm

Rider Status: Camel Status:

Thirst: Well Hydrated Thirst: Quenched

Hunger: Satiated Hunger: Satiated

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 5

You travel throughout the Afternoon and cover 14 miles.

Day: 3 Distance Traveled: 79 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Evening Location: Desert Plains Weather: Extremely Hot

Rider Status: Camel Status:

Thirst: Well Hydrated Thirst: Quenched

Hunger: Hungry Hunger: Satiated

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 4

During your travels you are able to capture a small animal for you to eat.

You travel slowly and carefully throughout the Evening and cover 3 miles.

Day: 3 Distance Traveled: 82 Pursuer Distance: Your pursuers are more than a day's ride away.

Time: Night Location: Ruins Weather: Warm

Rider Status: Camel Status:

Thirst: Well Hydrated Thirst: Quenched

Hunger: Hungry Hunger: Hungry

Energy: Tired Energy: Fresh

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6: 1

You decide to rest for the remainder of the Night.

You sleep soundly under the stars.

Day: 4 Distance Traveled: 82 Pursuer Distance: Your pursuers are within a day's ride of you.

Time: Morning Location: Ruins Weather: Warm

Rider Status: Camel Status:

Thirst: Well Hydrated Thirst: Quenched

Hunger: Hungry Hunger: Satiated

Energy: Fresh Energy: Invigorated

What would you like to do:

1) Rest

2) Search for Food

3) Search for Water

4) Travel Carefully

5) Travel Regularly

6) Ride Hard

Please enter a selection 1 - 6:

[...]