CS100 Fall 2016

Name _____

CPADS Project
CPADS and the Quest to Implement the Logic in the Holy Grail
Part 2: Crossing the Bridge of Death over the Gorge of Eternal Peril

Students of CPADS seeking a project to implement – you shall have another task to make yourselves an example in these dark times. Behold! Below are links to the *Bridge of Death Scene* from *Monty Python and the Holy Grail*. It is now your sacred task to implement the logic from within that scene. That is your purpose - the Quest to Implement Even More Logic from the Holy Grail.

YouTube video: Monty Python and the Holy Grail - Bridge of Death Scene Video

Script: Monty Python and the Holy Grail - Bridge of Death Scene Script

Watch the video clip, and then review the script. The Bridge Keeper asks each of the Knights of Camelot three questions, to which they provide responses. If a knight answers all three questions correctly, he gets to cross the Bridge of Death (BoD), which spans the Gorge of Eternal Peril (GoEP). If a knight gets any question wrong, he is immediately cast into the GoEP. At one point, King Arthur responds to the Bridge Keeper's third question with a query of his own, which the Bridge Keeper is unable to answer. As a result, the Bridge Keeper is immediately cast into the GoEP and the remaining knights safely cross the bridge unimpeded by further queries.

Your task for this project is to implement the logic from the *Bridge of Death Scene* in Python (which, by the way, was named after Monty Python). You are to implement this project from scratch, but you may use the *Witch Scene* assignment solution as a basis for your project. You are to structure the project using a series of functions that return a value (CORRECT, INCORRECT, GOEP), in a similar manner to the *Witch Scene* assignment. Here is the information you will need in order to implement this project.

Characters

There are six characters in the scene:

1) King Arthur of Camelot.
2) Sir Robin.
3) Sir Launcelot.
4) Sir Galahad.
5) Sir Bedevere.
6) Bridge Keeper.

Each must be capable of answering and asking questions. Each knight answers up to three questions asked by the Bridge Keeper, and each knight may ask a question of the Bridge Keeper. An incorrect answer by any of the characters results in that character immediately being cast into the GoEP. In addition, if the Bridge Keeper answers a question incorrectly, not only is he immediately cast into the GoEP, but any knights that have yet to cross the BoD may now do say without having to answer any further questions.

Name _____

Questions:

The questions that the Bridge Keeper asks fall into four categories:

1) "***What is your name?***" This is always the first question asked of each knight.
2) "***What is your quest?***" This is always the second question asked of each knight.
3) "***What is your favorite color?***" This question is asked of every other knight, starting with the first knight.
4) A question much more difficult than the first three. These questions are asked of every other knight, starting with the second knight. The two that are asked in the scene are:
    a. "***What is the capital of Assyria?***"
    b. "***What is the air-speed velocity of an unladen swallow?***"

There is one question asked of the Bridge Keeper in the scene:

5) "***What do you mean? An African or European swallow?***"

Each knight has a different favorite color. We are told in the scene that Sir Launcelot's is blue, and that Sir Galahad's is not blue, but is in fact yellow. However, never gets to finish that answer, as he absent-mindedly gives Sir Launcelot's response – copying from Launcelot's three answers, resulting in his own demise.

Let that be a lesson: copying answers– not a good thing in AD 932, not a good thing now… ☺

Since there are six characters, you should plan on creating six functions, one for each character. Each of the knights' functions should accept a question number (1-3), and should call the Bridge Keeper function that will actually ask the questions and accept and return the answers to the calling knight function. Each knight's function will validate the answers and return CORRECT for a correct answer, INCORRECT for an incorrect answer, and GOEP if the Bridge Keeper answered a question incorrectly.

Thus, you can use a loop in the **main()** routine to call each knight's function three times, and test the responses, and then act accordingly – continuing to ask questions, casting the knight into the GoEP, or allowing them to pass over the BoD, either because they answered all three questions correctly, or the Bridge Keeper was cast into the GoEP.

There should be a function for the Bridge Keeper that is called from within each of the knight's functions that actually asks the questions of the knights. The Bridge Keeper function should accept the following parameters:

1) The knight's name
2) The # of the question (1-3).
3) The text of the question (this will only be used on the third question).

For the first question, the Bridge Keeper will always ask, "***What is your name?***"

For the second question, the Bridge Keeper will always ask, "***What is your quest?***"

For the third question, the Bridge Keeper will ask the odd-numbered knights (Sir Launcelot and Sir Galahad), "***What is your favorite color?***"

Name _____

For the even-numbered knights (Sir Robin and King Arthur), the Bridge Keeper will ask, "***What is the capital of Assyria?***" and "***What is the air-speed velocity of an unladen swallow?***", respectively. If the text of a question is passed to the Bridge Keeper for the third question, he will ask that question, instead.

The Bridge Keeper function should issue the question as a prompt, and then wait to accept the knight's answer. The Bridge Keeper function should return the knight's answer.

The calling knight function should then check that answer against the knight's possible correct responses. If the knight gave the correct answer, the function should return **CORRECT**, otherwise, it should return **INCORRECT**.

If the knight's response is a question to the Bridge Keeper, the Bridge Keeper function should prompt for the answer, and then check the response against its own correct answers. If the Bridge Keeper answers incorrectly – or with "***I don't know that!***", then he is cast into the GoEP, with an appropriate message being issued, and the Bridge Keeper function returns the string, "***You are now free to pass.***" When the calling knight's function sees that response, it should return GOEP, indicating that the Bridge Keeper has been cast into the GoEP and that no more questions need be asked/answered, and all of the remaining knights can no safely cross the BoD.

Answers:

Here is a list of the acceptable answers for the knight's names:

1) KING ARTHUR: "***It is Arthur. King of the Britons***" OR "***King Arthur***" OR "***Arthur, King of the Britons***"
2) SIR LAUNCELOT: "***Sir Launcelot of Camelot***" OR "***Sir Launcelot***" OR "***Launcelot***"
3) SIR ROBIN: "***Sir Robin of Camelot***" OR "***Sir Robin***" OR "***Robin***"
4) SIR GALLAHAD: "***Sir Galahad of Camelot***" OR "***Sir Galahad***" OR "***Galahad***"
5) SIR BEDEVERE: "***Sir Bedevere of Camelot***" OR "***Sir Bedevere***" OR "***Bedevere***"

Here is a list of the correct responses to "***What is your quest?***":

1) "***To seek the Holy Grail***"
2) "***I seek the Grail***"

Here is the list of the knight's favorite colors:

Sir Launcelot: ***blue***
Sir Robin: ***tie-dye***
Sir Galahad: ***yellow***
King Arthur: ***red***
Sir Bedevere: ***paisley***

Here is the list of correct answers to "***What is the capital of Assyria?***":

1) Assur
2) Ashur
3) Qalat Sherqat
4) Calah
5) Nimrud
6) Dur Sharrukin
7) Khorsabad
8) Nineveh

Source: The Capital(s) of Assyria, go to the end of the web page.

Name _____

And here are the correct responses to "***What is the air-speed velocity of an unladen swallow?***":

1) "***What do you mean? An African or European swallow?***" - for King Arthur only.
2) "***11 meters per second***" – for both King Arthur and the Bridge Keeper.
3) "***24 miles an hour***" – for both King Arthur and the Bridge Keeper.

Source: Air-Speed Velocity of an Unladen Swallow

You should accept all of the answers as ***case-insensitive*** – meaning that you will need to have Python convert each answer to lower-case before checking it against the list of correct responses. You should also declare constants (all upper-case) for each of the favorite colors, with the lower-case string assigned to it, so that you can use that constant when you validate the knight's answer. You should do the same for each of the knight's names.

Thus, you would use those constants in your tests of the knight's correct responses (after converting those responses to lower-case.

Design and Implementation:

Look at the structure of the Witch Scene solution. You should create the six character functions first. And then create the test case structure so that you can test them independently. Your **main()** function will consist mostly of function calls to the character functions. Each of the knight functions should be enclosed in loops that call the knight functions up to three times, based on correct answers being given to the questions the Bridge Keeper function asks.

The program should advance through each knight, one at a time, in the order they appear in the ***Bridge of Death*** script. The Bridge Keeper function will ask the questions, and the user will reply to those questions, acting as each knight. When a knight responds with a question to the Bridge Keeper, the user will supply the answer for the Bridge Keeper.

Extra Credit:

Use Turtle Graphics to draw a simple representation of the Bridge of Death over the Gorge of Eternal Peril. You should create 5 separate turtles of different colors, one for each knight. You should also create a sixth turtle as the Bridge Keeper. When a knight answers all the questions correctly, move the turtle to the other side of the BoD. If a knight gets a question wrong, their turtle should be cast into the GoEP. If the Bridge Keeper is cast into the GoEP, the remaining knight's turtles should pass over the BoD.

Use Turtle Graphics to also label each character. You could also have the questions and responses pop up on the screen as "balloons" attached to each character's turtle, as in a comic strip.

If you have any questions, ideas, and/or suggestions, feel free to ask me.