*Your submission for this assignment **must include your full name** (as it appears on cuLearn) and you nine-digit **student number as a comment** at the top of **every source file you submit**.*

*Your submission for this assignment must be a **single source file** with a **file name of either** **'comp1405_f19_#########_a3.py'** or **'comp1005_f19_#########_a3.py'** (with the number signs replaced by your nine-digit student number). It **must also be written** using the **Python 3** programming language, and **must run on the official virtual machine**.*

Do not compress your submission *into a "zip" file.*

Late assignments will not be accepted *and will **receive a mark of 0**.*

Submissions that crash *(i.e., terminate with an error) on execution will **receive a mark of 0**.*

The due date for this assignment is Saturday, October 19, 2019, by 11:00pm.

The term "expert system" can refer to a computer program that is capable of decision making and can be used for diagnostics and classification. Furthermore, since the underlying knowledge used by the system is typically provided by a human expert, a rudimentary expert system is a relatively simple project. For this assignment, you will practice with branching and looping control structures in Python 3 by creating your own expert system that uses user input to "guess" film titles.

While designing your program you must first select two well-known movie "subgenres" from www.filmsite.org/subgenres2.html. To clarify, you are not to select one of the "main" film genres (e.g., "comedy", "action", etc.) and must instead select two more specific subgenres (e.g., "spaghetti western", "romantic comedy", "alien invasion", etc.) for which you will provide the expert knowledge.

The subgenres you select must appear on the list at www.filmsite.org/subgenres2.html and once you have selected which subgenres you will use, you must choose at least ten movies for each subgenre (i.e., at least twenty movies total). You will then need to determine what questions your expert system could ask the user in order to determine which of your film is being referenced by the user.

All of the work described above should be completed in full before you begin programming your submission.

As a clarifying example, the partial transcript such an expert system might follow for the subgenre of "Animated Christmas Special" could be as follows (with user input in red):

```
Does the film use stop-motion animation? no
Was the film based on a story by Dr. Seuss? yes
"How the Grinch Stole Christmas" is the film title.
...
Does the film use stop-motion animation? yes
"Rudolph the Red-Nosed Reindeer" is the film title.
```

The expert system you are designing MUST NOT ask questions unnecessarily. In the partial transcript above, for instance, if the user answered "yes" then the system should have been able to correctly conclude that the film was "Rudolph the Red-Nosed Reindeer" if it was indeed the only "Animated Christmas Special" that used stop-motion animation.
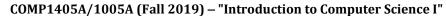
Although you will not submit your rough work for grading, you are required to create a flowchart before you begin programming. If you visit an instructor or teaching assistant you must present your flowchart before you will receive any assistance with implementation.

When designing your expert system algorithm, you must consider the following:

a) before doing anything else, your expert system must ask the user if they require instructions; if the user requests instructions then the program must display the instructions before proceeding with the program, but if the user does not then the program must proceed without providing instructions

b) your program must first ask the user for the subgenre and, as long as the user selects one of the two subgenres covered by your system, your expert system can begin asking questions; n.b., this is the only part of the program where you need to "validate" the input provided by the user - the program should end if the user does not select one of the two subgenres you have specified

c) each and every subsequent question asked by your program must be a "yes-or-no" question, and the user must be able to use both uppercase and lowercase letters when typing their answers to each and every question asked by your program

d) once your program has successfully identified the film, it must ask the user if they would like to quit the program and, if they elect not to quit, then your program must loop back to the stage where it first asked the user to select the subgenre

Please also note that your submission MUST include, in a detailed comment section at the beginning of your code, a list of the distinguishing elements of each of your selected movies. The purpose of this section is to facilitate the marking process, as your comments will allow the teaching assistants to know whether your system is working properly or not. As a clarifying example, a comment like:

```
# "How the Grinch Stole Christmas" – animated, written by Dr. Seuss, etc.
```

...must appear for EACH movie and must specify EVERY distinguishing feature used.

Specification for Assignment 3 of 6

This program (along with any other program submitted in this class) must be a completely original work, authored by you and you alone, prepared for this offering (i.e., Fall 2019) of COMP1405A or COMP1005A. Do not discuss this assignment with anyone except the instructors or the teaching assistants, and do not copy images or source code samples from the internet or any other source.