ASSIGNMENT 1

COMP-202, Fall 2014, All Sections

Due: September 19^{th}, 2014 (23:59)

Please read the entire pdf before starting.

You must do this assignment individually and, unless otherwise specified, you must follow all the general instructions and regulations for assignments. Graders have the discretion to deduct up to 10% of the value of this assignment for deviations from the general instructions and regulations. These regulations are posted on the course website. Be sure to read them before starting.

Question 1:	60 points
Question 2:	20 points
Question 3:	20 points
	100 points total

It is very important that you follow the directions as closely as possible. The directions, while perhaps tedious, are designed to make it as easy as possible for the TAs to mark the assignments by letting them run your assignment through automated tests. While these tests will not determine your entire grade, it will speed up the process significantly, which will allow the TAs to provide better feedback and not waste time on administrative details. Plus, if the TA is in a good mood while he or she is grading, then that increases the chance of them giving out partial marks. Marks can be removed if comments are missing, if the code is not well structured, or if your solution does not follow the assignment specifications.

Assignment

Question 1: Scratch Project (60 points)

You are to head to `http://scratch.mit.edu/` and create an account. Start by exploring some projects, and click on the **see inside** button in order to understand the logic behind each project. Feel free to make any changes to the scripts to see how it affects the overall behaviour of the program. Once you can honestly say to yourself, "Okay, I think I get this," you are ready to proceed.

Now it is time to choose your own adventure! Your mission is, quite simply, to have fun with Scratch and implement a project of your choice (be it an animation, a game, interactive art, or anything else), subject only to the following requirements.

- Your project must have at least two sprites, at least one of which must resemble something other than a cat.
- Your project must have at least three scripts total (i.e., not necessarily three per sprite).
- Your project must use at least one condition, one loop, and one variable.
- Your project must use at least one sound.
- Your project should be more complex than most of those demonstrated in lecture (many of which, though instructive, were quite short) but it can be less complex than, say, Scratch Scratch Revolution. As such, your project should probably use a few dozen puzzle pieces overall.

Feel free to peruse additional projects online for inspiration, but your own project should not be terribly similar to any of them. Try to think of an idea on your own, and then set out to implement it. But do not try to implement the entirety of your project all at once: pluck off one piece at a time. It is important to take your time and break overall task into sub and simpler tasks.

If, along the way, you find it too difficult to implement some feature, try not to fret; alter your design or work around the problem. If you set out to implement an idea that you find fun, you should not find it hard to satisfy this assignment requirements.

Once finished with your project, click **See project page** in Scratch's top-right corner. Ensure your project has a title (in Scratch's top-left corner), some detailed instructions (in Scratch's top-right corner), and some notes and/or credits (in Scratch's bottom-right corner). Then click **Share** in Scratch's top-right corner so that others like your **TA** can see your project. Finally, take note of the URL in your browser's address bar. That's your project's URL on MIT's website, and you will need to send it to us in the `Question1.txt` file you will create.

Oh, and if you would like to exhibit your project in Fall 2014's gallery, head to `http://scratch.mit.edu/studios/517481/projects/`, then click **Add projects**, and paste in your own project's URL.

Moreover, if you would like to participate to the Fall 2014 Scratch contest, where you get to vote as well as participating, please submit that same URL to the course's subreddit, `http://www.reddit.com/r/comp202/`. The three most upvoted[1] projects will be given McGill goodies, *e.g.* t-shirt, key-chain, pen, bag, *etc.* The grand winner will also receive an additional prize.

Question 2: Simple Java Program (20 points)

You are to write your very first marked Java piece of code. The program will ask the user to input the number of laws of robotics according to Isaac Asimov. This is achievable using the `Scanner` object as seen in class. You will have to save the `String` input into a variable in order to output back the answer.

Your program should output the following:

```
Hal: How many laws of robotics are they according to Isaac Asimov?
2         < ----- Input by the user
Hal: Indeed they are 2 laws of robotics.
```

In order to produce this output you will need at least three instructions. One instruction to print the sentence to ask for a number, although it could be a letter. One instruction to save that information in a `String` variable. One instruction to print the sentence `Hal: Indeed they are **String variable** laws of robotics.`

BONUS (5 points) - Use an if statement that will check if the number of laws is three. In the case it is true you should output the following "Hal: You got it right. Three indeed.". You should use the method `String.equals(String)`. In the case the user did not entered the right number, you have to mentioned it and then recite the three laws of robotics, which you will have to find.

Question 3: Binary and Logic (20 points)

Please write your answer in the `Question3.txt` file. Each line is an answer to a question, if you do not know the answer leave that line blank. In other words, the first line refers to line 1 of the text file, line 2 refers to the question 2, and so on. Each question is 5 points each.

a. What is 28 in binary[2]?

b. What is 11010 in base 10[3]?

c. What does the following logical expression evaluate to?

```
(False or False) and (True and (not False))
```

[1] Downvotes will not count
[2] Where 28 is a base ten number
[3] Where 11010 is a base two number

d. Let a and b be boolean variables. Is it possible to set values for a and b to have the following expression evaluate as False?

```
a or (((not b) or (not b)) or (b or (not a)))
```

What To Submit

You have to submit one zip file with all your files in it to MyCourses under Assignment 1. If you do not know how to zip files, please ask any search engine or friends. Google might be your best friend with this, and a lot of different little problems as well.

`Question1.txt` - Scratch URL
`Question2.java` - The complete java code to run the code
`Question3.txt` - One line for each answer

`Confession.txt` (optional) In this file, you can tell the TA about any issues you ran into doing this assignment. If you point out an error that you know occurs in your problem, it may lead the TA to give you more partial credit. On the other hand, it also may lead the TA to notice something that otherwise he or she would not.

Marking Scheme

Up to 30% of question 2 points can be removed from bad indentation of your code as well as omitting comments, or missing files. Marks will be removed as well if the class names are not respected.

Question 1

Two sprites	10	points
Three distinct scripts	10	points
The project runs	10	points
The project is well explained and titled	10	points
Has a least one if, loop and one variable	20	points
	60	**points**

Question 2

Get the input of the user	10	points
Some comments and right indentation	5	points
Displays the right dialogue	5	points
Use `if-else` to check if "3" is entered	5	bonus points
	20	**points**

Question 3

a.	5	points
b.	5	points
c.	5	points
d.	5	points
	20	**points**