Name ____ Period ______

Variables and user input

Your Tasks (Mark these off as you go)

- ☐ Define key vocabulary
- ☐ Declare and initialize variables
- ☐ Write a program to swap the values of two variables
- ☐ Write code to concatenate user input
- ☐ Receive credit for this lab guide

☐ Define key vocabulary

variable

variable declaration

variable initialization

concatenate

String variable type

number variable type

boolean variable type

NaN

cast (as it applies to javascript)

algorithm

computer program

□ Declare and initialize variables

Variables are data types that we use in programming. Variables are essential for controlling the memory in our programs. What you a create a variable in JavaScript, your doing what is called *declaring a variable*. In the example below the key word *var* has been used to create a variable named *x*.

```
var x;
```

When naming variables, regardless of the type, the following rules apply,

- Variable names must begin with a letter (or an underscore character)
- Variable names cannot contain spaces
- The only "punctuation" character permissible inside a variable name is an underscore "_".
- Variable names cannot be one of the reserved words that are part of the JavaScript library

Indicate whether each of the following variable declarations are legal or illegal. If the declaration is illegal, indicate why.	
code	**legal/illegal**
var script	
var java-script;	
var 2Name;	
var String;	
var num;	
code-is-cool;	
computer_Science	

To avoid illegal variable names, you should always apply the "lower camel case" naming convention. That is, the first letter in the variable is lower case. If there are multiple words associated with the variable name, they are run together. Each word in the variable (except for the first word) is capitalized. Consider the example below.

```
var myFinalScore;
```

Assigning a value to a variable is called initializing. The following code illustrates how to initialize the variable x.

```
x = 10;
```

Once a variable has been initialized, it can be changed at any point in the program. Notice in the above example, x was only declared once.

```
var x = 10;
x = 11;
x = x + 1;
```

To print the value of a variable to the console, we use the same print statement we learned previously. The following code could be used to print *x*. Notice in the below example, there are no quotes around the variable. If there were quotes around x, "x" is what would be printed. Leaving the quotes off, prints the value of the variable.

```
console.log(x);//prints 12
```

(a) Declare a variable “i”, but do not initialize it
(b) Initialize “i” to your age
(c) Assign the year you will graduate to “i”
(d) Add “4” to “i”
(e) Print the following message to the console: I will graduate from college in *concatenate the value of i*

Variables can also be declared an initialized on the same line.

```
var x = 10;
```

In fact, multiple variables can also be declared an initialized on the same line.

```
var x = 10, y = 5, z = 6;
```

The above examples illustrate how to store numeric data in memory. In JavaScript, we can also store String type variables. A String is any grouping of characters on your keyboard (letters, numbers, spaces, symbols, etc.) surrounded by single quotes: ' ... ' or double quotes " ... ". Though we prefer single quotes. Some people like to think of string as a fancy word for text. Consider the following examples

```
var name;
name = "wigglesworth";
console.log("My name is ");
console.log(name);
```

Write code to,
(a) Declare a variable called name and assign your name to it.
(b) Create a new variable called message and assign the message “I love to code” to it.
(c) Log the above variables to the console.

□ Write a program to swap the values of two variables

An *algorithm* is a set of steps or rules that can be applied to solve a problem or perform a specific task.

For example, a set of rules for giving someone directions, could be

- Drive 400 yards to Harrison boulevard
- Turn right on to Harrison boulevard
- Continue for 3 blocks, then turn left on …
- Etc.

When solving problems in computer science, it is typically easier to decide on the steps needed to solve the problem, before you set out to write the required code.

Consider the following variables and their assignments.

x ←3
y ← 2

Write an algorithm that could be used to interchange the values of x and y. When your algorithm is applied, x should be assigned the value of y (2) and y should be assigned the value of x (3). Your algorithm should work for any value of x or y. Remember an algorithm is NOT code, it is a series of steps written in readable language. Feel free to create new variables as necessary.

Once you have decided on your algorithm, now you can write the computer program required to implement your algorithm. A *computer program* is a collection of instructions that can be executed by a computer to perform a specific **task**.

Write a program that could be used to interchange the values of x and y. Your program should work for any value of x or y. Log the final values of x and y.

```
var x = 3;
var y = 2;
```

□ Write code to concatenate user input

Concatenation means to combine or attach things together. In JavaScript this is done with the plus (+) sign.

Consider the following example. Below, the variables initialized to “Hello” and “good buddy” are concatenated and assigned to a new variable c. The program prints Hellogood buddy to the screen.

```
var mm = "Hello";
var nx = "good buddy";
var c = mm + nx;
console.log(c); //prints Hellogood buddy... notice no space between o & g
```

A space between the words “Hello” and “good” could have been achieved by concatenating a space between these words as shown below,

```
var mm = "Hello";
var nx = "good buddy";
console.log(mm+ " " + nx);//prints Hello good buddy..notice the space
```

The example below also illustrates another way a space could have been achieved,

```
console.log("Hello" + " good buddy"); //prints Hello good buddy
```

It is possible to concatenate a String with a numeric variable as follows. This is a useful technique for converting an int variable type to a String variable type.

```
var x = 17;
var s = "Was haben wir gemacht?"//German for "What have we done"
var combo = s + "" + x;
console.log(combo);//prints Was haben wir gemacht?17
```

We learned previously that variables can also be assigned using input from the user using the prompt command, which pops up a dialog box asking the user for input.

The example below prompts the user for their first and last name, then prints a message to the console.

```
var firstName = prompt('Enter your first name');
var lastName = prompt('Enter your last name');
var fullName = firstName + ' ' + lastName;
console.log('Hello' + fullName);
```

Write code to prompt a user for 3 pieces of information. Each piece of information should represent a different variable type: String, number, boolean. Concatenate the pieces of information into a new variable called result, the print result to the console.

□ Receive Credit for this lab guide

Submit this portion of the lab to Pluska to receive credit for the lab guide.