

Lab 5

Get checked off for up to 3 points of incomplete work from the previous lab within the first 10 minutes of the lab.

In this lab, you can form a group of 2-3 individuals. You must be checked off together as a group at the end of the lab. Although you perform tasks as a group, ensure that you understand the work and ask questions to TAs as needed.

(5 pts) Computation

A liter is 0.264179 gallons. Write a program that will read in the number of liters of gasoline consumed by two cars and the number of miles traveled by each car. The program should output the number of miles per gallon delivered by each car. The program should also announce which car has the best fuel efficiency (highest number of miles per gallon). The program should allow the user to repeat this calculation as often as the user wishes.

(5 pts) Pass by Value

- Write a function called **swap_sentence(string sen1, string sen2)** that takes two string inputs as parameters and swap them.
 - The prototype for this function is as follows. You need to determine pre conditions and post-conditions for this function. The preconditions are anything you can say holds true about the function parameters before the function is called, and the postconditions are anything you can say holds true about the parameters, after the function executes.

void swap_sentence(string, string);

- In main function, create two string objects to read the strings from the user, you will need the <string> library, i.e. **#include <string>**. Since, a user can enter a single word or a string with spaces, you will need to use the **getline()** function to read the strings/sentences from the user, i.e. **getline(cin, s)**.
- Once you get the two strings from the user, call the function **swap_sentence()**
- Print the two string objects both in the **swap_function()** and in the **main()**.

- Example code:

```
void swap_sentence(string sen1, string sen2){
    // swap functionality implemented by you...

    cout << "In swap function ..." << endl;
    cout << "sen1: " << sen1 << endl;
    cout << "sen2: " << sen2 << endl;
}

int main() {
    string sentence1, sentence2;
```

```

cout << "Enter sentence 1: ";
getline (cin, sentence1);
cout << "Enter sentence 2: ";
getline (cin, sentence2);

swap_sentence(sentence1, sentence2);

cout << "In main function ..." << endl;
cout << "sentence1: " << sentence1 << endl;
cout << "sentence2: " << sentence2 << endl;

return 0;
}

```

What did you notice?

Can you find which are formal parameters and which are actual parameters.

Are the sentences swapped in the swap_sentence() function? What about inside main()?

(No implementation in this lab for this part)

Now, how can the swap_sentence() be changed, so it modifies the string parameter directly.

You need to add an & to the string parameter.

```
void swap_sentence(string &sen1, string &sen2);
```

Let us learn more about it in our next lab

Show your completed work and answers to the TAs for credit. You will not get points if you do not get checked off!

If you finish the lab early, please utilize your time to clarify any questions from the TAs about conditional loops, functions or Assignment 2.