COMP.2030 Homework 2 Due: 9/15 (Wed) 11:59 PM

Consider an array, X, with positive integers. The last value in X is set to 0 to mark the end of the array.

void main() {

int i = 0;

int found = 0;

while (!found && X[i] != 0){

if (X[i] == key) found = 1;

i++;

}

If (found)

printf(%d, i);

else

printf(“-1”);

}

For simplicity, suppose that the search key, key, is global, and a linear search program can be written as on the right.

1. Write a pseudo-C code of the C program on the right.

initialization:

i = 0

found = 0

while:

if (found || X[i] == 0) goto printFound

if (X[i] != key) goto else

found = 1

goto while

else:

i = i + 1

goto while

printFound:

if (!found) goto printNegativeOne

print(i)

goto exit

printNegativeOne:

print(“-1”)

goto exit

exit:

1. Write a MIPS code from the pseudo-C code in part (1).
2. Implement the MIPS code in part (2) in MARS. You can include an arbitrary array X, and initialize the key value in a register.

Check the grading policy in the next page before you start part (3)

What to submit:

Include the following two in **a text file** (your\_last\_name.txt or your\_last\_name,docs):

1. Your pseudo-C code in part (1).
2. MIPS code in part (3) with comments (copy the code from MARS and paste into the text file).

**HW Grading Policy**

HWs will be graded according to the following distribution:

Correctness of execution (70%), Comments (30%).

* Comments are critically important, and comments will be graded.
* Each function has to be preceded by comments including the name of the function, arguments and their registers, and how the return value is passed.
* Each line of MIPS instruction is typically commented on the right in a short C-like statement, so that comments on the right provide pseudo-C type of instructions.
* Read the homework assignments carefully. If you miss any of the requirement, points will be taken off (yes, even if it compiles fine).
* No plagiarizing. you will get 0 and be reported if a copy from one another/cheating is founded out.
* Working with your classmates on homework is fine, but you have to write your code and are not allowed to copy off one another (plagiarizing). As such, please make sure all your work that you have completed is written by you and you alone. The logic and reasoning can be similar, but not the code. I understand if certain sections can only be written in one way, but it does look very fishy if you and another student’s HW look exactly the same. Please write the names of the people you worked with on the top comment of the code to clear up any confusion.