

Write the assembly language code in ARC (simplified SPARC code). Test it with the simulator. You must use comments or lose half the points. There are 3 questions, 10 points each.

1.

In the main program, you CAN NOT load the entire array into the registers. You can only work with two elements of the array at a time. For the swap subroutine you must use the basic stack operations for %r15, as shown in class.

```
int a[10] = {10,8,6,4,2,9,7,5,3,1};
int I,j;

main () {

    for (I=0; I<10; ++I) {
        for (j=0; j<9; ++j) {
            if (a[ j ] > a[ j+1 ]) {
                swap ();
            }
        }
    }
}

int temp;
swap () {
    temp = a[ j ];
    a[ j ] = a[ j+1];
    a[ j+1] = temp;
}
```

2. Write the code as is, DO NOT remove the subroutines. And don't forget the basic stack operations for %r15.

```
int a[10], I, j;

main () {
    for (I=0; I<10; I++) {
        if (I==0) {
            j =I;
            sub3;
        } else if (I <=5){
            sub2();
        } else {
            sub1();
        }
    }
}
```

```

        }
    }
}

sub1 () {
    j = I *2;
    if ( j >2 ) {
        sub3();
    } else {
        j = 0;
        sub3();
    }
}

sub2 () {
    j = I/2;
    if ( j <3 ) {
        j = 0;
        sub3();
    } else {
        sub3();
    }
}

sub3 () {
    a[I] = I +j;
}

```

3. Note the subroutine uses recursion to find the answer. You will need to use the full stack operations for %r15 as well as storing the parameters and return value for the subroutine in the registers.

```

main () {
    int x =0;
    x = sub1(4);
}
int sub1(int f) {
    if (f ==1) {
        return 0;
    } if (f ==2) {
        return 1;
    } else {
        return 2 + sub1(f-1) ;
    }
}

```

Turning in the Assignment: (you must do both sections)

Hard copy:

1. title page:

Cosc 2150
Homework #7
Section #
Repo name
your Name

in large font on the page. At the bottom of the page, include a non-empty statement of help delivered and help received. It is OK to state that no help was given or received. It is **NOT** ok to omit the statement of help.

Soft copy:

1. Use this link to create your repo <https://classroom.github.com/a/gENbznNF>
2. Assembly code for question 1 as the file name q1.asm
3. Assembly code for question 2 as the file name q2.asm
4. Assembly code for question 3 as the file name q3.asm
5. Edit the readme.md file, add the following:
 - Change X to be 7
 - Name
 - List anything that doesn't work (that you know of)
6. Remember, if the code is not on the github website, then you didn't turn it.