Homework MIPS
CS 5300

Instructions The included jar file is an executable jar that you can use to write your MIPS code. You will submit three files: *add.asm*, *fee.asm*, and *array.asm*.

1. (10 points) Write MIPS code that loads the values 3 and 4 into registers, adds them, and prints the result (the value 7). You will probably want to use the system call 1 (print_int). Put your code in `add.asm`.

2. (15 points) Write MIPS code for the following C- code. You will need a label for the `fee()` function and will pass in formal arguments using the stack. Do not pass the parameters in with registers. Recall that the stack pointer grows *down*, that is, from large address to small address. Put your code in `fee.asm`.

```
int fee(int a, int b) {
  return a+b;
}
void main() {
  print(fee(3, 4));
}
```

Your assembly code should have the following structure:

```
main:
        # put 3 and 4 on the stack using the register $sp

        # call fee. You'll probably want to use the jal instruction to
        # store the current address in $ra

        # load results from stack to registers

        # print result

        # exit

fee:
        # copy a and b from stack to local registers

        # add a and b

        # place result on stack

        # return using jr instruction
```

3. (20 points) Write MIPS code for the following C- code. You will not need a loop for allocating or initializing the array, but you will need a loop to sum the elements. Allocate the array on the stack and pass a dope vector as the formal argument to `fee()`. The dope vector will store the address of the array and the number of elements in the array. Note that it will store the address of the array and *not* the offset of the array from `$sp`. The dope vector will be on the stack. The multiplication instruction is `mul`. Put your code in `array.asm`.

```
int fee(int arr[]) {
  int sum = 0;
  for (int i = 0; i < length(arr); ++i) {
```

```
    sum = sum + arr[i];
  }
  return sum;
}
void main() {
  int a[3];
  a[0] = 1;
  a[1] = 3;
  a[2] = 5;
  print(fee(a));
}
```