

CS201 Computer Science I

Homework 3

Due: 10/14, 11:59pm

This homework corresponds to materials up to looping. Answer each of the following questions clearly. For every program, include your algorithm in the write-up, use meaningful variable names and comment your code well for readability. Email your report to ctsai@iona.edu with the subject line “Homework3 submission”.

1. **(10 points)** Write a program which prints an upside-down, right-angle triangle using “*”. We have discussed the algorithm in our first lab session. Use a constant to store the base. If the base is set to 5, the output should be

```
*****
****
***
**
*
```

2. **(10 points)** The Fibonacci numbers are a sequence of integers in which the first two elements are 1, and each following element is the sum of the two preceding elements. The mathematical definition of each k^{th} Fibonacci number is the following:

$$F(k) = \begin{cases} F(k-1) + F(k-2), & k > 2 \\ 1, & k \leq 2 \end{cases}$$

For example, the first 12 Fibonacci numbers are:

1 1 2 3 5 8 13 21 34 55 89 144

Write a program with a loop structure that computes and prints the first n Fibonacci numbers. Use a constant to store n .

3. **(10 points)** Write a program called printDesign that produces the following output. Use a constant to store the base. In the example below, the base is set to 9.

```
*****1*****
****333****
***5555***
**777777**
*99999999*
```