Advanced Topics in

Computer Programming

THREE PROBLEM SET

1. Reverse Digits

Your first task is to break a number into its individual digits, for example, to turn 1729 into 1, 7, 2, and 9. It is easy to get the last digit of a number *n* as `n % 10`. But that gets the numbers in reverse order. Solve this problem with a stack. Your program should ask the user for an integer, then print its digits separated by spaces.

2. Reverse Sentences

Use a stack to reverse the words of a sentence. Keep reading words until you have a word that ends in a period, adding them onto a stack. When you have a word with a period, pop the words off and print them. Stop when there are no more words in the input. For example, you should turn the input

```
Mary had a little lamb. Its fleece was white as snow.
```

into

```
Lamb little a had mary. Snow as white was fleece its.
```

Pay attention to capitalization and the placement of the period.

3. Driveway

A homeowner rents out parking spaces in a driveway during special events. The driveway is a "last-in, first-out" stack. Of course, when a car owner retrieves a vehicle that wasn't the last one in, the cars blocking it must temporarily move to the street so that the requested vehicle can leave. Write a program that models this behavior, using one stack for the driveway and one stack for the street. Use integers as license plate numbers.

Positive numbers add a car, negative numbers remove a car, zero stops the simulation.

Print out the stack after each operation is complete.