

Programming I

Lab 5

For each of the 4 exercises below, turn in a separate .java files to your folder on the Labdata drive.

1. Write a program that sums up the digits of **any** positive integer entered by the user. Using a loop, the program repeatedly extracts the rightmost digit (by applying modulus 10 and then dividing by 10). The program output the sum.
2. Write a program that computes the average of a set of numbers entered by the user. Using a **do-while** loop, the program repeatedly prompts the user for a number, adding it to a running sum. The loop stops when the user enters '0' for input. After the final sum is obtained, your program computes the average value and then display the answer. Your program can follow the structure below:

```
create a scanner object
declare sum, and initialize it to 0
declare a variable to hold the value entered by the user

Repeat as long as value entered is not a zero
    prompt the user to enter a value
    add value to sum

compute and display the average
```

3. Create an animation that incorporates some element of randomness in at least two of the following three aspects: cell location, color, text. Your code must use a loop.
4. The objective of this program is help a user decide on a payment plan for a loan. Given a loan amount, an annual interest rate, and a monthly payment amount, the program will display the monthly balance until the loan is paid off. Since the interest rate entered is on annual basis, your program will need to compute the corresponding monthly interest rate by dividing by 12. The interest rate should be entered as a decimal value between 0 and 1 (0.1 means 10% interest rate). Interest is compounded on a monthly basis. The program will finally output a statement indicating how many years and months will be required to pay off the loan. Below is a sample output of the program with a loan amount of \$1000, yearly interest rate of 10%, and a monthly payment of \$100. You might want to model your program according to it.

```
Enter loan amount: 1000
Enter yearly interest rate (0.0-1.0): 0.1
Enter expected monthly payment: 100
```

Months	Balance
1	\$907.5
2	\$814.2291666666666
3	\$720.1810763888889
4	\$625.3492520254629

5	\$529.7271624590084
6	\$433.30822214616677
7	\$336.0857906640515
8	\$238.05317225291859
9	\$139.20361535502624
10	\$39.530312149651465

It will take you 0 years and 11 months to pay the loan off.

Note that in the program used to produce the above output, the monthly payment was subtracted before the interest was compounded. Switching the order of these operations will produce slightly different results.