



New York University
Computer Science Department
Introduction to Software Development
Dr. Anasse Bari

Homework 3: *Practicing control statements and Strings.*

Deadline: See NYUclasses for the deadline, 15% off per day after the deadline (3 days maximum).

Learning Objectives:

- Leveraging conditional and iterative statement to implement a relatively complex program such as the ATM Machine
- Using the class String and methods defined in the String class to solve problems
- Learning ASCII code of characters

Please read the guidelines carefully to avoid receiving a zero on the HW:

- Please use the following naming convention “ExerciseX.java”, where X is the number of the exercise. Please apply this convention to all coming homework assignments during the semester.
- Compile and run the program for each exercises.
- Make an archive (zip file or compressed file) with all the **java files (the .java files NOT the .class files)** and post it on NYU Classes (StudentName_Homework_X.zip)
- It is your responsibility to make sure that the Zip files has your actual files. You may send the file to yourself by email to double check that is the actual file before you upload on NYU classes.
- **If the graders cannot open the file, you will receive a grade of zero.**
- **If you send the .class files instead of the .java files (source files) you will receive a zero.**
- Please **do not send the entire project**, the Java file for each exercise is all that we need.
- Cheating will be severely addressed with an immediate zero on the homework and a report to the academic advisor and the administration.
- You will automatically lose 50% of the points for an exercise if the program does not compile and run correctly.
- Comment your code. You might lose points if you Do NOT comment your code.
- The number of points for each questions is being specified.
- Plagiarized assignments will receive a ZERO. You cannot change the variable names of other student’s solution and submit it as yours. The program structure of other students must not match yours. Every student has to come up with his/her own

solution. Any cheating (e.g. copying from internet without citing sources) is a serious violation of the University student code.

Exercise 1 (25 points)

ATM Machine

Design a simple ATM service kiosk. This kiosk supports the following options for its menu:

1. View your account balance
2. Deposit Cash
3. Withdraw cash
4. Exit

Initially, the account balance is \$0.00. When you deposit money, this account balance is increased by your deposit amount. Similarly, when you withdraw cash, this account balance is decreased by your withdrawal amount. You cannot withdraw more than what exists in the account. Similarly, you cannot deposit a negative cash amount. Use if-else statements or a switch statement to perform the respective operation from the menu. The ATM kiosk provides these three options until the user selects the option to leave the kiosk. At the end of every transaction, the user is being asked if they need to perform another transaction. You may want to use a **do-while statement** to satisfy this last requirement.

Example and expected output:

```
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 1

Your current balance is 0.00
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 2

Enter the amount you want to deposit: 100
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 3

Enter the amount your want to withdraw: 97
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 1

Your current balance is 3.00
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 3

Enter the amount your want to withdraw: 5
Sorry you don't have enough balance!
1. View your Balance
2. Deposit Cash
3. Withdraw Cash
4. Exit

Enter your selection: 4

Goodbye
```

Exercise 2 (25 points)

Power of an Integer

Use a **for**-loop to compute the power of an integer. The user is asked to input:

1. An integer
2. The power to raise the integer provided in 1.

The output is the result shown in the following form.

$$3 \times 3 \times 3 \times 3 = 81$$

In the above example, the integer was 3 and the power to raise it to was 4. The left-hand size of the result must be displayed in expanded multiplication form as shown above.

You must display the results in the format shown above and below. Failure to display the result in the required format will result in deducting points.

```
Enter an integer: 7
What power do you want 7 to be raised to? 5
7 x 7 x 7 x 7 x 7 = 16807
```

Exercise 3 (15 points)

Implement a Java program that prints a table of characters that are equivalent to the Ascii codes from 65 to 126 (126 included) (You will need to use int and cast it to char)

Your program should be print five characters per line.

Read about Ascii codes:

<http://www.ascii-code.com/>

<http://www.computerhope.com/jargon/a/ascii.htm>

Exercise 4 (25pts)

Write a program that prompts the user to enter two strings and displays the largest common prefix of the two strings. Here are some sample runs:

```
Enter the first string: Welcome to Java
Enter the second string: Welcome to programming
The common prefix is Welcome to
```

```
Enter the first string: Atlanta
Enter the second string: Morocco
Atlanta and Morocco have no common prefix
```

Exercise 5 (10 point)

Write a Java program that converts a decimal number to binary based 2.

For instance, 45 in binary is 101101.

The decimal number is an input from the user. (You would need to use a Scanner)

You will need to provide two solutions in the following files:

Exercise5A.java

In this solution you need to use *toBinaryString()*

Exercise5B.java

In this solutions you **cannot** use `toBinaryString`, you will need to use control statement (conditional and iterative to be able to convert a decimal number of binary)

More on [binary number](#)