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NACA.161 Programming Fundamentals II
In-class Exercise Day 09 – Utility Classes

Overview

To create programs using the String and Math utility classes.

MyUtilities Class

1) Create a class called **MyUtilities** that will contain methods that you will create in this exercise. This will NOT contain a main method.

2) Create a method called **swap** that accepts a String as a method parameter. The method will do the following:

Method parameter:

a) A string that contains a first name and a last name (with one space between the names.)

Calculation:

b) Convert the input string into a new string that starts with the last name and ends with the first name. You also need to have a comma between the two names.

Return value:

c) The new string

What String methods did you use to create this new String?

subString

3) Compile the class.

FunGames Class

4) Create a class called **FunGames** that contains a main method. You will use this class to get user input and call your utility classes.

5) Make a loop that keeps accepting a character from the user until the user types in the letter 'x'.

6) Inside the loop, issue a prompt that tells the user to enter an 'a' to swap names and an 'x' to exit the program. Make the prompt look like the following:

```
Please type one of the following letters:
 a - to swap names
 x - to exit the program
Enter choice:
```

7) Compile and run the program to make sure the loop exits when an 'x' is entered.

8) Inside the loop, create a switch statement that tests the value of the character entered by the user.

9) In the switch statement, do the following steps if the user enters an 'a':

   a) Get a name from the user. Make sure you tell the user to enter the first name followed by the last name

   b) Call the **swap** method of the **MyUtilities** class and store the returned value.

   c) Get another name from the user.

   d) Pass the name into the **swap** method and save the returned value into another variable.

   e) Compare the two names that were saved and print them in alphabetical order.

   What String method did you use?

   substring
   ____

Adding Another MyUtilities Method

10) Create another method called **reverse** that accepts a String as a method parameter. The method will do the following:

Method parameter:

- A string

Calculation:

- Reverse the characters in the input string. For example, if “abcde” is passed to this method, it needs to create a new string: “edcba”

Return value:

- The reversed string

What type of loop did you use to create this new String?

For

What String method did you use to figure out how long the string was?

length

What String method did you use to get the character at each position of the original string?

charAt

Back to the FunGames Class

11) Add another option in your prompt that tells the user to enter a ‘b’ to reverse a string.

12) Add another test in the switch statement for a value of ‘b’.

13) Do the following if the user types a ‘b’:
    - Get a string from the user, pass it to the reverse method, and print the result of the returned value.

14) Compile and test the **FunGames** class.

Another MyUtilities method

15) Create another method called **anagram** that checks to see if the method parameter is an anagram. An anagram is a string that is spelled the same forwards and backwards.

Create the method as follows:

Method parameter:

- A string

Calculation:
NOTE: A method can call any method in its own class just by using the method name, and parantheses with the required number of arguments

- This makes it easier to write the method, all you have to do is:

  a) Pass the method parameter into a call to the **reverse** method
  b) Store the returned value from the **reverse** method
  c) Compare both strings (HINT: Do not use ==, use one of the String methods)
  d) Return true if the strings are the same, otherwise return false

Return value:

- True or false

Back to the FunGames Class

16) Add another option in your prompt that tells the user to enter a 'c' to see if your string is an anagram.

17) Add another test in the switch statement for a value of 'c'.

18) Do the following if the user enters a 'c':

- Get a string from the user, pass it to the **anagram** method, and print whether or not the string was an anagram.

19) Compile and test the **FunGames** class.

Another MyUtilities method

20) Create a method called **randomize** that will generate a random number based on the two method parameters passed to it.

Create a method as follows:

Method parameter:

- An integer value that is the minimum number to use for the random number
- An integer value that is the maximum number to use for the random number

Calculation:

- Generate a random number using a method in the **Math** class. Use the min and max values to set the minimum and maximum value of the random number.

What Math method did you use?

random + round

Return value:

- The random number generated

Back to the FunGames Class

21) Add another option in your prompt that tells the user to enter a 'd' to generate a random number.

22) Add another test in the switch statement for a value of 'd'.

23) Do the following if the user enters a 'd':

- Get two numbers from the user (ask them for a minimum and a maximum number).
- Print the value of the random number returned from the **randomize** method.

24) Compile and test the **FunGames** class.

When you complete all of the steps successfully and answer all of the questions, contact your instructor to check if your program(s) executes correctly and to review your code. We will initial the line below.

________Successful execution of code

If you do not finish the program during the class period, contact your instructor to initial below so that you can complete it before the next class period.

________Code not completed during lab time

You may then have your instructor verify your work at the <u>start</u> of work period in the next class. If you do not have a signature, then you can not receive any points for this assignment.