**Northeastern Illinois University**

**CS-200: Programming I**

**Methods**

**Problem 1.**

* Write a program that has the class name Problem1 and that has the main method.
* Write a second method named maxMod5 that takes two integer parameters, a and b.
* The method should return whichever integer is larger. However, if the two integers have the same remainder when divided by 5, then the method returns the smaller integer. In all cases, if the two integers are the same, return 0.
* Several sample method calls are provided for you below. You should test your method inside the main method.

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| --- | --- |
| Sample Method Usage | Return Value |
| **int** n1 = maxMod5(7, 5); | 7 |
| **int** n2 = maxMod5(-4, 3); | 3 |
| **int** n3 = maxMod5(6, 11); | 6 |
| **int** n4 = maxMod5(8, 8); | 0 |

**Problem 2.**

* Write a program that has the class name Problem2 and that has the main method.
* Write a second method named evenlySpaced that takes three integer parameters, a, b, and c.
* One of the integers is the smallest, one integer is largest, and one is in between the other two. Return true if the three values are evenly spaced, so the difference between small and medium is the same as the difference between medium and large. Otherwise, return false. You can assume that the three integers will be unique values.
* Several sample method calls are provided for you below. You should test your method inside the main method.

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| Sample Method Usage | Return Value |
| **boolean** b1 = evenlySpaced(2, 4, 6); | true |
| **boolean** b2 = evenlySpaced(4, 6, 2); | true |
| **boolean** b3 = evenlySpaced(4, 6, 3); | false |

**Problem 3.**

* Write a program that has the class name Problem3 and that has the main method.
* Write a second method named sumProduct that takes two integer parameters, a and b and returns a String.
* The method should calculate the sum and the product of a and b. If sum is greater than

product, program should return the String "Sum". Similarly, if the product is greater than the sum, it should return the String "Product". If the sum and the product are the same, then return the String "Tie". In all the cases, the program should return "Awesome" if the sum and product are both divisible by 8.

* Several sample method calls are provided for you below. You should test your method inside the main method.

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| --- | --- |
| Sample Method Usage | Return value |
| String s1 = sumProduct(5, 1); | Sum |
| String s2 = sumProduct(64, 32); | Awesome |
| String s3 = sumProduct(8, 7); | Product |
| String s4 = sumProduct(2, 2); | Tie |

**Problem 4.**

* Write a program that has the class name Problem4 and that has the main method.
* Write a second method named getRandomNumber that takes no parameters and returns a random integer between 0 to 100.
* Write a second method called weatherCheck that accepts a String for the season and an integer for the temperature and returns a String.
* You should pass the value returned by getRandomNumber as an integer parameter when you are calling weatherCheck.
* Check if the season is Fall and if:
* temperature is between 0-30 return "It's cold for a fall".
* temperature is between 30-60 return "It's a normal temperature for fall."
* temperature is more than 60 return "It's hot. I cannot believe it is fall."
* Check if the season is Winter and if:
* temperature is between 0-30 return "It's normal temperature for winter."
* temperature is between 30-60 return "It's warm. Very nice weather."
* temperature is more than 60 return "It's super-hot for winter. Do you even live in Chicago?"
* Check if the season is Spring and if:
* temperature is between 0-30 return "It's cold for a spring."
* temperature is between 30-60 return "It's a normal temperature for spring."
* temperature is more than 60 return "It's hot. It appears that summer is already here."
* Check if the season is Summer and if:
* temperature is between 0-30 return "It's too cold for summer. Well, here is Chicago for you."
* temperature is between 30-60 return "It's cold. Is it summer yet?"
* temperature is more than 60 return "It's so nice. I love summer."
* Several sample runs are provided for you below. Your output must be formatted **exactly** like the sample runs below. Note that while your output must be formatted as below, you will not get the same results as this uses random numbers.

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| Sample Method Usage | Return |
| String s1 = weatherCheck("Winter", 72); | 72 degrees. It's super-hot for winter. Do you even live in Chicago? |
| String s2 = weatherCheck("Spring", 35); | 35 degrees. It's cold for a spring. |
| String s3 = weatherCheck("Fall", 68); | 68 degrees. It's hot. I cannot believe it's fall. |
| String s4 = weatherCheck("Summer", 59); | 59 degrees. It's cold. Is it summer yet? |

**Problem 5.**

* Write a program that has the class name Problem5 and that has the main method.
* In the main method prompt the user for n1 and n2.
* Write a second method named max that takes two integer parameters, a and b.
* The method should return whichever integer is larger without using the Math class. The method should also display which integer was larger or that they are equal.
* Several sample method calls are provided for you below. You should test your method inside the main method.

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| Sample Method Usage | Output |
| **int** n1 = max(5, 5); | They are equal |
| **int** n2 = max(-4, 3); | n2 is the max at: 3 |
| **int** n3 = max(6, 11); | n2 is the max at: 11 |
| **int** n4 = max(8, 2); | n1 is the max at: 8 |

**Problem 6.**

* Write a program that has the class name Problem6 and that has the main method. This method should take user input. You may assume the integer that is input is less than 100.
* Write a second method named sumOfDigits that takes one integer parameter, a.
* The method should return the sum of the digits entered by the user. Then print out the sum in the format below.
* Several sample method calls are provided for you below. You should test your method inside the main method.

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| **Sample Method Usage** | **Output** |
| **int** n1 = sumOfDigits(10); | Sum is: 1 |
| **int** n2 = sumOfDigits(99); | Sum is: 18 |
| **int** n3 = sumOfDigits(25); | Sum is: 7 |