**Lab3 Assignment**

**Task1：**Complete the following programming projects.

1. Write programs: input a positive integer N, then output an arithmetic progression [1, 3, 5, 7, … , 2N+1]. Use six possible variations of a counter-controlled loop shown in page 96 of our textbook to design this program. Name your program files like these **3.1-1.rap, 3.1-2.rap, …, 3.1-6.rap**.
2. Write a program that input a positive integer N, then calculates and outputs the summation of the list [2, -5, 8,-11, … , (3\*N-1)\*(-1)N+1]. Name your program file **3.2.rap**.
3. Write a program: to count how many negative numbers the user entered, using 999 to stop the input. Name your program file **3.3.rap**
4. Design a number guessing game. Randomly generate an integer in the range [1, 100] in your program. Let the user guess and input a number. If the entered number is equal to the guessed number, output “Congratulations, you got it.” and stops the program. Otherwise, output the prompt “larger than the guessed number” or “less than the guessed number” and let user guess again. Repeat this process until the user guess it. Name your program file **3.4.rap**.

**Hits: To randomly generate, you can use this expression**

floor(100\*random)+1

(**random** function can return a random value in [0.0, 1.0). Multiplying **random** by 100, we can get a value in [0.0, 100.0). The function floor() is used to round down a real number and generate an integer. So the expression **floor(100\*random)** generates a random integer in [0, 100). By adding 1 to it, we get an integer in [1, 100]. )

1. Write a program: input an integer N, output the number of digit in N, for example, if N is 1234, the number of digit in it is 4. Name your program file **3.5.rap**
2. Write a program: output a shape depicted as follows. You should use a loop control to finish it. And let the user input the number of layers. Name your program file **3.6.rap**. The number of layers should be a positive integer; therefore an input validation loop should be used in your program.

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1. Write a program: input a positive integer N, then calculate 1!+2!+3!+…+N! , and output the result. Name your program file **3.7.rap**

**Assignment submission:**

You should submit all raptor files into the Directory Lab3 into your network drive. <http://192.168.0.248/inbox/>