

# Assignment 6 – Loops

## Learning Objective

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Write a Python program that uses while and for loops.

## Assignment Description

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Write a program that allows the user to play a game using a virtual 20-sided die. The naming convention of dice is a D followed by the number of sides. The most common dice are 6-sided: D6. In this program, you will be rolling a virtual 20-sided die, called a D20!

This program plays a game where the user picks one of 5 cases. There are multiple winning numbers for each of the 5 different cases:

- o Case 1: Roll a number any even number
  - o Valid winning numbers for Case 1 are 2, 4, 6, ..., 18, 20
- o Case 2: Roll any odd number
  - o Valid winning numbers for Case 2 are 1, 3, 5, ..., 17, 19
- o Case 3: Roll any number 5 through 10 inclusive
  - o Valid winning numbers for Case 3 are 5, 6, 7, 8, 9, 10
- o Case 4: Roll an even number 10 or greater
  - o Valid winning numbers for Case 4 are 10, 12, 14, 16, 18, 20
- o Case 5: Roll any multiple of 3
  - o Valid winning numbers for Case 5 are 3, 6, 9, 12, 15, 18



The user wins points by rolling one of the winning numbers. Rolling the D20 will be done virtually using the random module to randomly pick a number between 1 and 20 (inclusive).

Before the user's roll, the program prints out which numbers qualify for points by using a range-based `for` loop. If the user wins, then they earn 50 points. The game is played 5 times by using a range-based `for` loop. The user's score is printed at the very end.

## Sample Output

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```
Enter a number (1-5): 6
Enter a number (1-5): 0
Enter a number (1-5): 5
You are playing for Case 5
To win, roll one of the following numbers
3 6 9 12 15 18

You rolled a 14
You didn't win.

Enter a number (1-5): 4
You are playing for Case 4
To win, roll one of the following numbers
10 12 14 16 18 20

You rolled a 2
You didn't win.

Enter a number (1-5): 3
You are playing for Case 3
To win, roll one of the following numbers
5 6 7 8 9 10

You rolled a 11
You didn't win.

Enter a number (1-5): 2
You are playing for Case 2
To win, roll one of the following numbers
1 3 5 7 9 11 13 15 17 19

You rolled a 13
You win 50 points!

Enter a number (1-5): 1
You are playing for Case 1
To win, roll one of the following numbers
2 4 6 8 10 12 14 16 18 20

You rolled a 6
You win 50 points!

Your total score is 100 points.
```

## Steps

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1. In PyCharm, open your existing APP\_Python project.
2. In the Assignments directory, create a new Python file called `assignment6.py`.
3. At the top of the file, put comments in the following format and replace the name, email, and section with your actual information and fill in the description:

```
# Assignment 6  
# Name: First Last  
# Description: (fill in)
```

4. Import the random module.
5. Create a variable for the score.
6. Use a `for` loop to run the game 5 times.
7. Each time the game is played (i.e., inside the `for` loop), get input from the user. Use a `while` loop to ensure the user enters a number between 1 and 5 inclusive. When testing, the graders will only enter integers. Using the following prompt (user's input is shown in green):

```
Enter a number (1-5): 6  
Enter a number (1-5): 0  
Enter a number (1-5): 4
```

8. Using branching based on the number entered, tell the user which case they are playing for and print out the valid winning numbers so they know what numbers they are hoping to roll. You must use range-based `for` loops to print the valid winning number for each of the 5 cases, as described in the Assignment Description on the first page. Do NOT hardcode printing the winning numbers. If you need help, review how to write 2-input and 3-input range-based `for` loops (i.e., use the `range(start, stop, step)` function with 2 or 3 arguments). To display text on the same line with multiple calls to the `print()` function, use the `end` parameter (`end=" "`), which is similar to what you did in the previous lab. The example below has two spaces between numbers. Here is an example when the user enters 4:

```
You are playing for Case 4  
To win, roll one of the following numbers  
10 12 14 16 18 20
```

9. "Roll" the D20 by generating a random number between 1 and 20 (inclusive). You should use the `random.randrange()` or `random.randint()` function. Print a

message with the random integer. Here is an example when the return value is 12:

**You rolled a 12**

10. Use branching to check to see if the user "won" based on the case. Since you know that the random number will be less than 21, you can use math operations ( $>$ ,  $\geq$ ,  $<$ ,  $\leq$ ,  $\%$ , etc.). If the user wins, add 50 points to their score and display a message.

**You win 50 points!**

11. If the user did not win, display a message to the user saying they didn't win. Here is the message to the user saying they didn't win:

**You didn't win.**

- o One way to do this is to use boolean operators (and, or) in the branching statements in the previous step such that each `if` and `elif` will win. Then the `else` will capture not winning.
- o Another way to do this is to create another variable such a boolean that is set to `True` if the user wins. You initially create it with a value of `False` before the branching (previous step). In the branching when the user has won, set the variable to `True`. After the branching, check this variable. If it equals `False`, print the message.
- o There are other ways to accomplish this.

12. After the game has been played 5 times, print out the total score. Here is an example when the user wins three times:

**Your total score is 150 points.**

- 13. Follow coding conventions. Use camelCase or snake\_case for variable names.
- 14. Test the program. Look at the Sample Output.
- 15. Submit your `assignment6.py` file to your LA through WhatsApp.

## Grading Rubric

<b>Assignment 6 Fall 2025</b>		
<b>30 points total</b>		<b>Points</b>
<b>Point Breakdown</b>	Run game 5 times using a ranged-based for loop	2
	User input with while loop (used to get an int between 1 - 5)	4
	Use range-based for loops to print each case (2 pt per case)	10
	Get random number and print	2
	Branching to check if user won based on case	5
	Print message (win or lose)	2
	Calculate score correctly and print at end	4
	Comments	1
Solution		Total <b>30</b>