Chapter 4: Pennies for Penny

Time required: 120 minutes

- Comment each line of code as shown in the tutorials and other code examples.
- Follow all directions carefully and accurately.
- Think of the directions as minimum requirements.

Pseudocode

1. Write pseudocode or TODO for the exercise
2. Submit with the assignment

General Requirements

Penny is hired for a job. Her employer agrees to pay her every day.

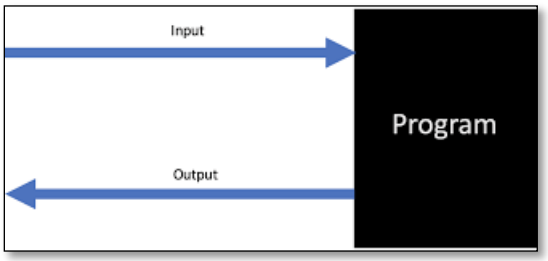
Her employer agrees that Penny's salary is 1 penny the first day, 2 pennies the second day, 4 pennies the third day, continuing to double each day.

Step 1: Pseudocode

Build your problem solving TODO's one step at a time.

There may be mistakes in this pseudocode. The idea is to use this process to develop your own correct solution. Developing any program will involve some mistakes and dead ends.

All programs have 3 main parts. Start by dividing your pseudocode into three parts.



```
# ---------------------- INPUT -------------------------#

# ---------------------- CALCULATE ---------------------#

# ---------------------- DISPLAY -----------------------#
```

Step 2: TODO Pseudocode

This step is as if you were doing these calculations on a piece of paper. This generic pseudocode could be used in any programming language to create a program. It is not language specific.

```
# TODO: Prime the first day by initializing pennies earned to 1 penny
# TODO: Initialize running total

# TODO: Get the number of days worked from the user

# Calculate pennies for each day, each day doubles the day before
# TODO: Loop for the number of days entered by the user

    # TODO: Increase day count by 1 to display current day

    # TODO: Display day count and pennies earned for that day

    # TODO: Accumulate the running total of pennies

    # TODO: Calculate pennies for the next day
    # Multiply pennies earned * 2, accumulate into pennies earned

# TODO: Display the days and running total
```

Step 3: TODO Pseudocode to Python

This step takes the pseudocode and starts converting it into Python code.

```
# TODO: Prime the first day by initializing pennies earned to 1 penny
pennies_earned = .01

# TODO: Initialize running total
running_total = 0

# TODO: Get the number of days worked from the user
input()

# Calculate pennies for each day, each day doubles the day before
# TODO: Loop for the number of days entered by the user
for day_count in range(days)
    # ---------------------- CURRENT DAY ----------------------------------#
    # TODO: Increase day count by 1 to display current day
    day_count = day_count + 1

    # TODO: display day_count and pennies_earned for that day

    # TODO: Accumulate the running total of pennies

    # ------------------- GET READY FOR NEXT DAY -------------------------#
    # TODO: Calculate pennies for the next day
    # Multiply pennies earned * 2, accumulate into pennies earned
    pennies_earned = pennies_earned * 2

# TODO: Display the days and running total
```

Program Requirements

1. Create a Python program named **pennies.py**
2. Ask the user how many days Penny will work.
3. Use a range based for loop.
4. Calculate and display the salary in dollars that Penny will earn for per each day.
5. Calculate and display the total amount of pay in dollars.

```
+--------------------------------------+
|            Pennies for Penny         |
+--------------------------------------+

Enter the number of days Penny will work: 10
Day     Pennies for each day
-------------------------
1       $0.01
2       $0.02
3       $0.04
4       $0.08
5       $0.16
6       $0.32
7       $0.64
8       $1.28
9       $2.56
10      $5.12
The total salary for 10 days is: $10.23
```

Creative Challenge

- Run the program for 365 days to see how much doubling each day adds up. You may want Penny's job.

Assignment Submission

1. Attach the pseudocode.
2. Attach the program files.
3. Attach screenshots showing the successful operation of the program.
4. Submit in Blackboard.