Announcements

• Reminders
  – MPL Assignment 3 due Sun, Sept. 28th by 11:59pm
  – Program 3 due Mon, Sept. 29th by 11:55pm
  – Midterm 1 is on Wednesday (Oct. 1st)

Practice With Loops and Random Numbers

Guess the Number!

• Write a program that:
  – Randomly generates an integer between 0 and 100.
  – Continue to prompt your user to enter numbers until they enter the randomly generated number. (Think while loop)
  – To make the game a little easier, tell the user if their guess was too low or too high, and of course be sure to tell them when they guess correctly!

Sample Output

Your guess was too high.
Please try again: 45
Your guess was too high.
Please try again: 30
Your guess was too low.
Please try again: 23
You guessed right! Great work!

The for Loop

• Count-Controlled loop: iterates a specific number of times
  – Use a for statement to write count-controlled loop
    • Designed to work with sequence of data items
      – Iterates once for each item in the sequence
    • General format:
      for variable in [val1, val2, etc]:
      statements
Using the `range` Function with the `for` Loop

- The `range` function simplifies the process of writing a `for` loop
  - `range` returns an iterable object
    - `Iterable`: contains a sequence of values that can be iterated over
- `range` characteristics:
  - One argument: used as ending limit
  - Two arguments: starting value and ending limit
  - Three arguments: third argument is step value

Generating an Iterable Sequence that Ranges from Highest to Lowest

- The `range` function can be used to generate a sequence with numbers in descending order
  - Make sure starting number is larger than end limit, and step value is negative
  - Example: `range (10, 0, -1)`
    
    
    ```
    [10, 9, 8, 7, 6, 5, 4, 3, 2, 1]
    ```

Using `range` Function

Using the `range` function, how do we write the same code as the previous example?

```python
for num in range(1, 6):
    print(num)
```

```python
for num in range(5):
    print(num)
```

<table>
<thead>
<tr>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
For Loop Example

```python
for num in range(1, 10, 1):
    square = num * num
    if square % 5 != 0:
        print("The square of", num, "is", square)
```

Output:
The square of 1 is 1
The square of 2 is 4
The square of 3 is 9
The square of 4 is 16
The square of 5 is 25
The square of 6 is 36
The square of 7 is 49
The square of 8 is 64
The square of 9 is 81

Another For Loop Example

```python
def f_to_c(degrees_f):
    c = (degrees_f - 32) * 5/9
    return c

def main():
    f_min = int(input("Min temp: "))
    f_max = int(input("Max temp: "))

    for fah_temp in range(f_min, f_max+1, 1):
        cel_temp = f_to_c(fah_temp)
        print(fah_temp, cel_temp)

dmain()
```

Practice

Using a for loop, write a function that computes the factorial of a number. Reminder: factorial is n! or (1*2*3...*n)

Examples:

- factorial(5) returns 120  #(1*2*3*4*5)
- factorial(8) returns 40320  #(1*2*3*4*5*6*7*8)

Next Time

Review for Midterm 1