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CS 151

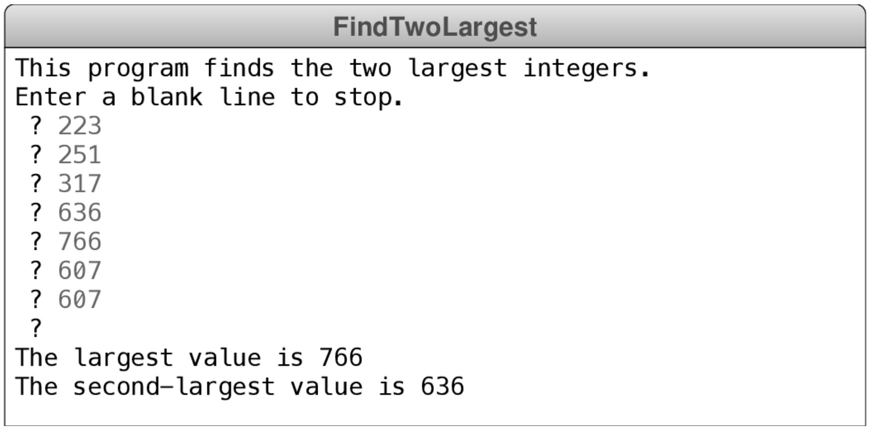
Handout #5
September 16, 2022

Problem Set #3—Python Programming

Due: 5:00 P.M., Friday, September 23

Problem 1 (Chapter 2, exercise 8, page 69)

Write a Python program that reads in integers up to a blank line and then prints both the largest and second-largest values in the user's input, as follows:

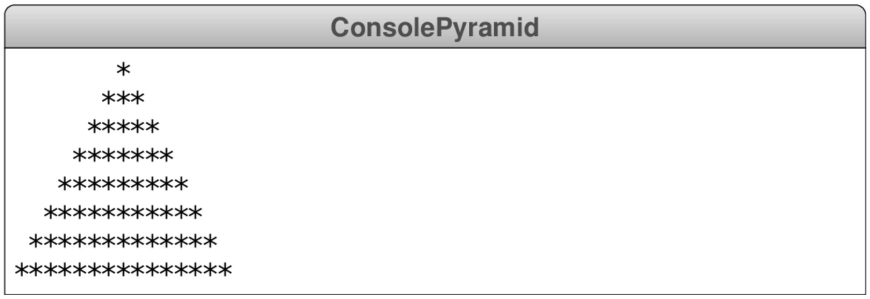


```
This program finds the two largest integers.
Enter a blank line to stop.
 ? 223
 ? 251
 ? 317
 ? 636
 ? 766
 ? 607
 ? 607
 ?
The largest value is 766
The second-largest value is 636
```

The values in this sample run are the number of pages in the British hardcover editions of J. K. Rowling's *Harry Potter* series. The output tells us that the longest book is the *Harry Potter and the Order of the Phoenix* at 766 pages and the second-longest book is *Harry Potter and the Goblet of Fire* at 636 pages.

Problem 2 (Chapter 2, exercise 10, page 70)

Write a function `draw_console_pyramid(height)` that draws a pyramid of the specified height in which the width of each row increases by two as you move downward on the console. Each of the rows should be centered with respect to the others, and the bottom line should begin at the left margin. Thus, calling `draw_console_pyramid(8)` should produce the following figure:



```
       *
      ***
     *****
    *******
   *********
  ***********
 *************
***************
```

Problem 3 (contributed by Professor Jed Rembold)

While printing content or inputting content from the terminal is nice, often times you want. to have more control over graphic elements of your program. To that end, we use the PGL library in CS 151. To start things off in a very simple manner and to give you a little more practice using the library before you delve more deeply into it in Problem Set #4, this week you will just need to draw a pretty picture of whatever you might like. A few qualifications though to get full points:

- It must be a coherent picture. No purely abstract art comprised of random shapes.
- You must use multiple colors.
- You must use multiple types of `GObjects` (ovals, rectangles, lines, and so forth).
- You must define at least one function which groups together some code relating to a particular object (or objects) in your image (for instance, a function to draw a tree at some location, or a cloud, etc.). The function must take some form of input in the form of arguments. It cannot, however, just be one of the helper functions we've given you, such as `draw_filled_circle`, although you are free to use those as well.
- You must use comments or docstrings to label what different functions or parts of your code are responsible for drawing,
- You must use a loop to draw some repeating portion of your image.
- You must title your masterpiece at the top or bottom using a `GLabel` centered horizontally within the window.

Although the names of the built-in colors are listed in the reader, the next page of this handout provides a chart on the named colors. You can also use something like a color picker to get the hex value for a. color (which starts with a # symbol) and provide that string (including the #) directly to the `set_color` method.

As a bit of an example, below is Jed's creation:

Sunset Sailing

Color chart for the named CSS colors

AliceBlue
AntiqueWhite
Aqua
Aquamarine
Azure
Beige
Bisque
Black
BlanchedAlmond
Blue
BlueViolet
Brown
BurlyWood
CadetBlue
Chartreuse
Chocolate
Coral
Cornsilk
Crimson
Cyan
DarkBlue
DarkCyan
DarkGoldenrod
DarkGray
DarkGreen
DarkKhaki
DarkMagenta
DarkOliveGreen
DarkOrange
DarkOrchid
DarkRed
DarkSalmon
DarkSeaGreen
DarkSlateBlue
DarkSlateGray
DarkTurquoise
DarkViolet
DeepPink
DeepSkyBlue
DimGray
DodgerBlue
FireBrick
FloralWhite
ForestGreen
Fuchsia
Gainsboro
GhostWhite
Gold
Goldenrod
Gray
Green
GreenYellow
Honeydew
HotPink
IndianRed
Indigo
Ivory
Khaki
Lavender
LavenderBlush
LawnGreen
LemonChiffon
LightBlue
LightCoral
LightCyan
LightGoldenrodYellow
LightGray
LightGreen
LightPink
LightSalmon
LightSeaGreen
LightSkyBlue
LightSlateGray
LightSteelBlue
LightYellow
Lime
LimeGreen
Linen
Magenta
Maroon
MediumAquamarine
MediumBlue
MediumOrchid
MediumPurple
MediumSeaGreen
MediumSlateBlue
MediumSpringGreen
MediumTurquoise
MediumVioletRed
MidnightBlue
MintCream
MistyRose
Moccasin
NavajoWhite
Navy
OldLace
Olive
OliveDrab
Orange
OrangeRed
Orchid
PaleGoldenrod
PaleGreen
PaleTurquoise
PaleVioletRed
PapayaWhip
PeachPuff
Peru
Pink
Plum
PowderBlue
Purple
Red
RosyBrown
RoyalBlue
SaddleBrown
Salmon
SandyBrown
SeaGreen
Seashell
Sienna
Silver
SkyBlue
SlateBlue
SlateGray
Snow
SpringGreen
SteelBlue
Tan
Teal
Thistle
Tomato
Turquoise
Violet
Wheat
White
WhiteSmoke
Yellow
YellowGreen