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| **Basic Operations**1 **+** 2 # addition2 **-** 1 # subtraction2 **\*** 3 # multiplication4 **/** 2 # division2 \*\* 3 # raise to power"a" **+** "b" # combines two strings**Comparison Operations**2 **<** 3 # less than"a" **>** "b" # greater than"a" **<=** "b" # less than or equal to2 **>=** 3 # greater than or equal to"a" **==** "b" # is equal to2 **!=** 3 # is not equal to**Boolean Operations****True and False** # both must be True**True or False**  # at least one True**not True**  # flips boolean value**Input and Output**# prints to the console**print(**"Hello World"**)** # prints multiple items**print(**"a", "b", "c"**)** # asks the user for input in consoles **=** **input(**"Enter a thing: "**)****Built-in Functions**x **=** **int(**s**)** # casts a string to an intx **= float(**s**)** # casts a string to a floats **= str(**x**)** # casts an int to a stringx **= len(**s**)** # finds num of letters in strx **= max(**a, b, c**)** # max of given numbersx **= min(**a, b, c**)** # min of given numbersx **= round(**y, d**)** # rounds y to d sig-digs**Variables**# assigns var x to hold the value 5x **=** 5# uses the value in var x**print(**x **-** 2**)** | **Functions**# sets up a new function, name# it takes params p1, p2, ... as input# it returns returnVal as output**def** name**(**p1, p2, ...**):** # do stuff here **return** returnVal# call a function name on vals a, bresult **=** name**(**a, b**)****Conditionals**# only runs code in the block# if the expression is True**if** option **== True:** **print(**"here"**)**# run code in a single branch# based on the boolean expressions**if** option1 **== True:** **print(**"branch 1"**)****elif** option2 **== True:** **print(**"branch 2"**)****else:** **print(**"branch 3"**)****Loops**# loops until the test is Falsei **=** start**while** i **<** end**:** **print(**i**)** i **=** i **+** step# breaks out of loop at some input**while True:** val **= input(**"Enter: "**)** **if** val **==** "something"**:** **break** **print(**val**)**# loops over the given range# with start, end, step**for** i **in range(**start, end, step**):** **print(**i**)**# loops over the chars in a string**for** c **in** string**:** **print(**c**)** |

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| **Tkinter Starter Code**# use this to create a window to draw graphics in**from** tkinter **import** \*root **=** **Tk()**width, height **=** 400, 400canvas **=** **Canvas(**root, **width=**width, **height=**height**)**canvas.**configure(bd=**0, **highlightthickness=**0**)**canvas.**pack()**# Put your code here!root.**mainloop()****Tkinter Graphics**# draws a rectangle between coords (left, top) and (right, bottom)canvas.**create\_rectangle(**left, top, right, bottom**)**# draws an oval in the bounding box with coords (L, T) and (R, B)canvas.**create\_oval(**L, T, R, B**)**# draws the given text centered at the given coordinate (x, y)canvas.**create\_text(**x, y, **text=**"sample"**)**# draws a line between the given points (x1, y1) and (x2, y2)canvas.**create\_line(**x1, y1, x2, y2**)**# draws a polygon by connecting the given points with linescanvas.**create\_polygon(**x1, y1, x2, y2, x3, y3, ...**)****Tkinter Optional Parameters**# changes the color of the drawn shapecanvas.**create\_rectangle(**left, top, right, bottom, **fill=**"red"**)**# changes the outline color of the drawn shapecanvas.**create\_rectangle(**left, top, right, bottom, **outline=**"yellow"**)**# changes the pixel width of the drawn line or shape's bordercanvas.**create\_line(**x1, y1, x2, y2, **width=**5**)**# changes the font of the drawn text- "font-name font-size font-style"canvas.**create\_text(**x, y, **text=**"sample", **font=**"Times 30 bold"**)**# changes the anchor point for the drawn textcanvas.**create\_text(**x, y, **text=**"sample", **anchor=**NW**)** |