

BAP 1.2 Conditional Statements and Iteration

Objectives:

- Be able to read a conditional scenario and turn it into a python program.
- Understand indentation and code blocks in python
- Know how to use inputs to make a program dynamic
- Be able to use iteration to perform repetitive tasks
- Be able to combine conditional statements and iterative processes in order to build more sophisticated programs
- Use conditional statements and iteration to automate tasks in business contexts

References:

- Python Programming, An Introduction to Computer Science, John Zelle
- Analytics in Python, edX, ColumbiaX - BAMM.101x
- [Investor.gov](https://www.investor.gov)

Class Materials:

[Class Questionnaire](#) (Help me get to know you)

[Click to take an anonymous quiz](#)

Room Name is: XRDG2THT7

[Replit Exercises](#) (Remember to fork to keep your own copy)

Jupyter Notebook:



Student - BAP 1-1.2 Jupyter

Notebook: Conditionals and Iteration.ipynb

Warm up: [Replit Exercises](#)

Investigate the following methods in replit or search in google to find out more.
Write a comment to explain.

```
#
```

```
input("Enter value: ")
```

```
#
```

```
range(10)
```

```
#  
room=125  
time="2:30pm"  
print("class meets in room", room, time)
```

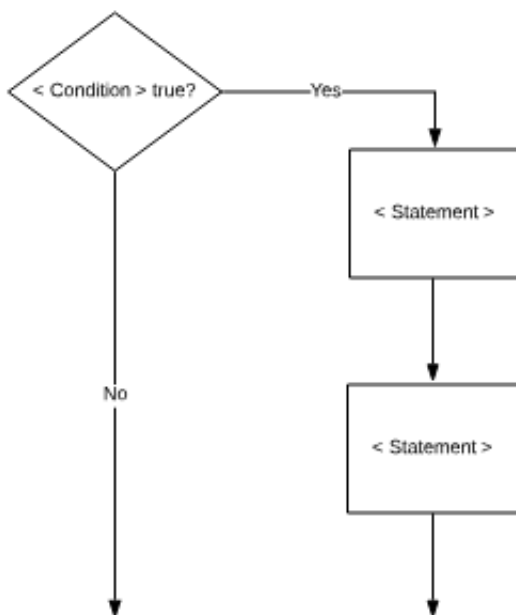
Come up with a formula to calculate the percent increase in an account given any starting balance and any ending balance.

```
# values for testing  
start=3000  
end=3225
```

```
# Formula to calculate percent increase (handles other possible start,end values)  
percent_increase =
```

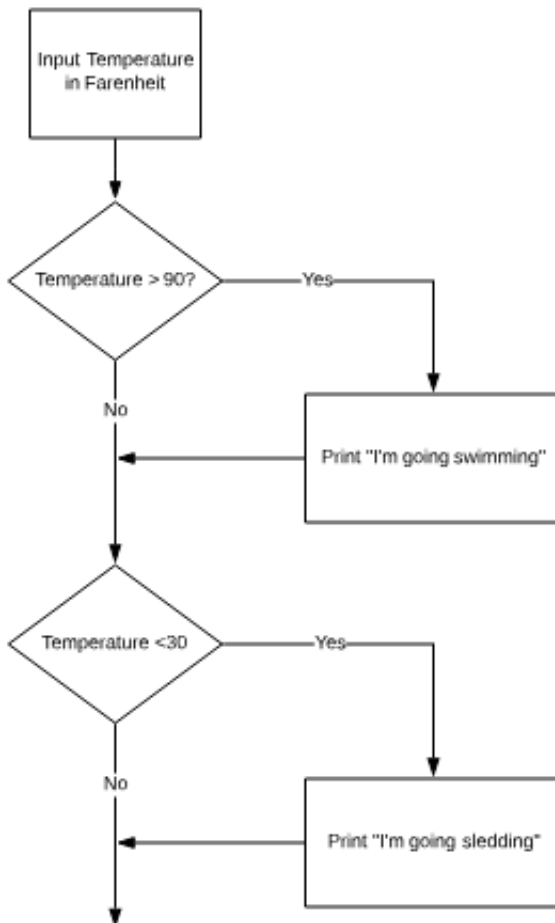
Conditional Statements and Programs: [Video Lesson \(8:30 min\)](#)

The "if" statement is used to control the behavior of a python program and in all other programming languages. The "if" statement allows us to say, "if this condition is true, do this thing, if this condition is false, do nothing or do something else". We can model this behavior in a flow chart.



Examples of conditional statements:

- if it's hot out, go swimming
- if it's cold out, go sledding

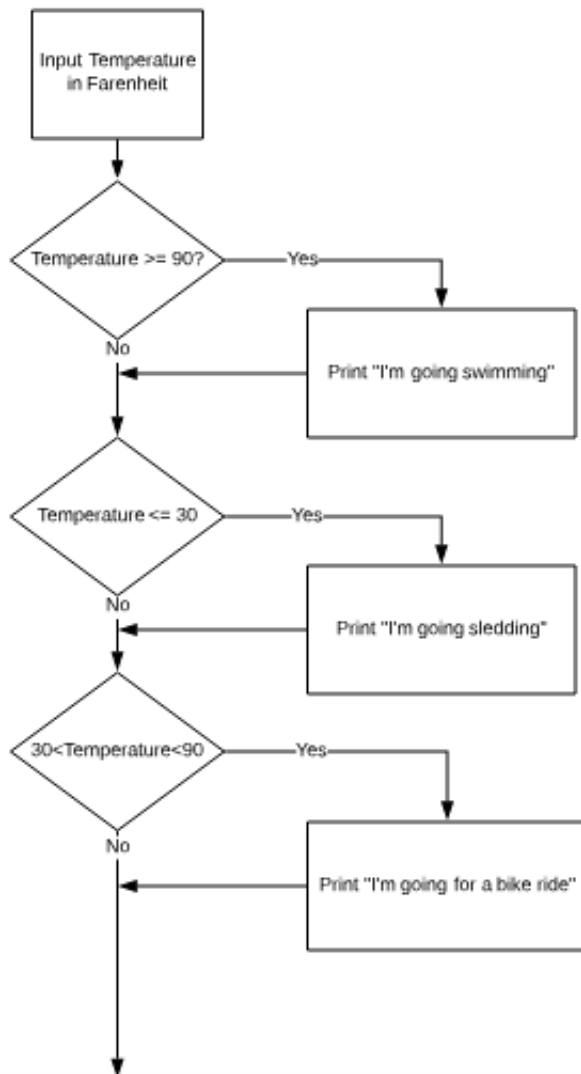


Let's write this up in Python:

```
## set the starting temperature  
temp=42
```

```
if temp>=90:  
    print("I'm going swimming")  
if temp<=30:  
    print("I'm going sledding")
```

Add an additional option:



When we have more than two cases, we'll use the 'elif' statement, short for 'else if'.

```
temp = int(input("enter a temperature: "))
```

```
if temp >= 90:
    print("I'm going swimming")
elif temp <= 30:
    print("I'm going sledding")
else:
    print("I'm going for a bike ride")
```

Example: Is it divisible?

Write a program that takes in two integer values as inputs. Write some code to do the following: If x is divisible by y, print (value of x) is divisible by (value of y). If x is not divisible by y, print (value of x) is not divisible by (value of y)

```
x=int(input("Enter an integer: "))
y=int(input("Enter a second integer: "))
```

```
if x%y==0:
    print(x, "is divisible by", y)
else:
    print(x, "is not divisible by", y)
```

Exercise: Evens and Odds

Exercise: Write a program to check if an integer input is even or odd. If even, print "(number) is an even number", if odd, print "(number) is an odd number"

Example: Account Balance

Write a program that takes in a starting yearly account balance and an ending yearly account balance for a company. If the percent increase is more than 20%, print, "the account balance has increased by (percent increase)". If the percent decrease exceeds 10%, print, "the account balance has decreased by (percent decrease)". Otherwise print "No action is required at this time".

```
start=float(input("Enter starting account balance: "))
end=float(input("Enter ending account balance: "))

if end>1.2*start:
    print("The account has increased by", ((end-start)/start)*100,"%")
elif end<.9*start:
    print("The account has decreased by", ((start-end)/start)*100,"%")
else:
    print("No action is required at this time")
```

Exercise: Stock Decisions

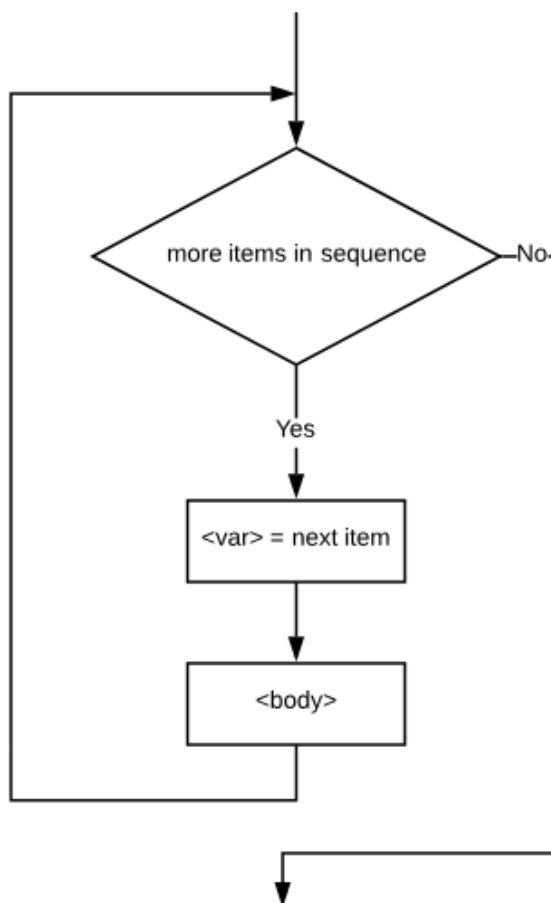
Write a program to take in two inputs -- the purchase price of a stock and the current price. If the current price is less than 90% of the purchase price, print "sell the stock to stop loss, you have lost (amount) dollars". If the current price is

more than 20% higher than the than the purchase price, print "sell the stock to make a profit, you have lost (amount) dollars". Otherwise print, "no action is required."

Iteration: [\(Video Lesson, 5:06 min\)](#)

Programmers use loops to execute a sequence of statements several times in succession. The simplest kind of loop is called a definite loop. This is a loop that will execute a definite number of times.

Modeling an iterative process in Python:



Example: Print all Values in range

```
# multiply every value in the range 0 to 10 by 10 and print the result
for i in range(10):
    x=10*i
```

```
print(x)
```

Example: Print values from a List

```
# using a list as an input
things=[1, 2, 3, 4, 5]
for thing in things:
    print(thing+2)
```

Example: Print characters in a string

```
# accessing each character in a string
str='abcdefg'
for i in str:
    print(i)
```

Example: Future Values

Let's write a somewhat more sophisticated program to calculate the future value of the principal on an investment after 10 years at a given rate (apr).

Program: Future Values

Inputs:

principal - the amount of money being invested in dollars.

apr - the annual percentage rate expressed as a decimal number.

Output: The value of the investment 10 years into the future.

Relationship: Value after one year is given by $principal(1+apr)$. This formula needs to be applied 10 times.

```
principal=float(input("Enter the amount of the initial principal: "))
apr=float(input("Enter the annual interest rate"))
```

```
for i in range(10):
    principal=principal*(1+apr)
print("The value after 10 years is: ", principal)
```

Example: Combining Iteration and Conditional Statements

We can combine the methods of conditioning and iteration in order to create powerful programs. We'll modify the program we used earlier to make decisions

about stock prices.

```
purchase_price=7
prices_list=[3,5,12,10,6,14,7]
profit=0
loss=0
even=0

for price in prices_list:
    if price < purchase_price * .9:
        loss+=purchase_price-price
    elif price > purchase_price * 1.2:
        profit+=price-purchase_price
    else:
        even+=1

print("You have made a profit of $",profit, "and lost $",loss, "you broke even",
even, "time(s)")
```

Exercise: House Prices

A house is listed for sale at a price of \$360,000. Write a program that takes in a list of offers (integers) and counts the number of offers that are either equal-to/above, or below asking price. Print a final statement that communicates how many offers are above asking price and how many are below asking price.