Computational Thinking?

Session-3

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Flowcharts

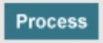
Let's discuss and try to predict what does flowchart mean!

Flowcharts

- A flowchart is a diagram that represents a sequence of instructions.

- Flowcharts have standard symbols to represent different instructions.

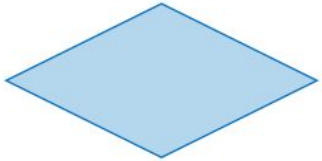
Flowcharts

Name	Symbol	Usage
Start or Stop		The beginning and end points in the sequence.
Process		An instruction or a command.
Decision		A decision, either yes or no.
Input or Output		An input is data received by a computer. An output is a signal or data sent from a computer.
Connector		A jump from one point in the sequence to another.
Direction of flow		Connects the symbols. The arrow shows the direction of flow of instructions.

Flowcharts

START - END

PROCESS



CONDITION

CONNECTOR

DISPLAY

INPUT

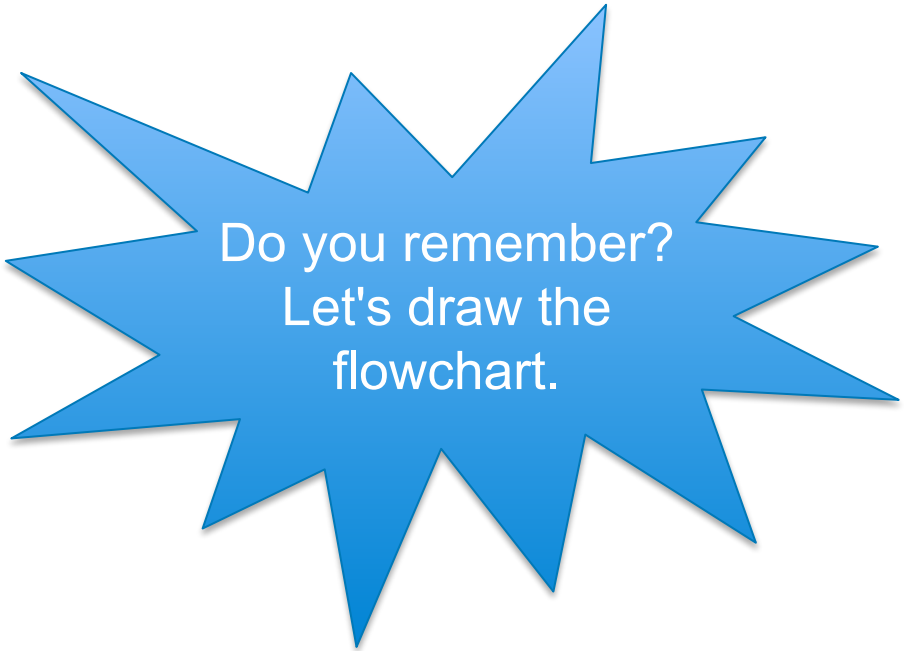
Example

START

INPUT number1 ,number2
sum=number1+number2

PRINT sum

END



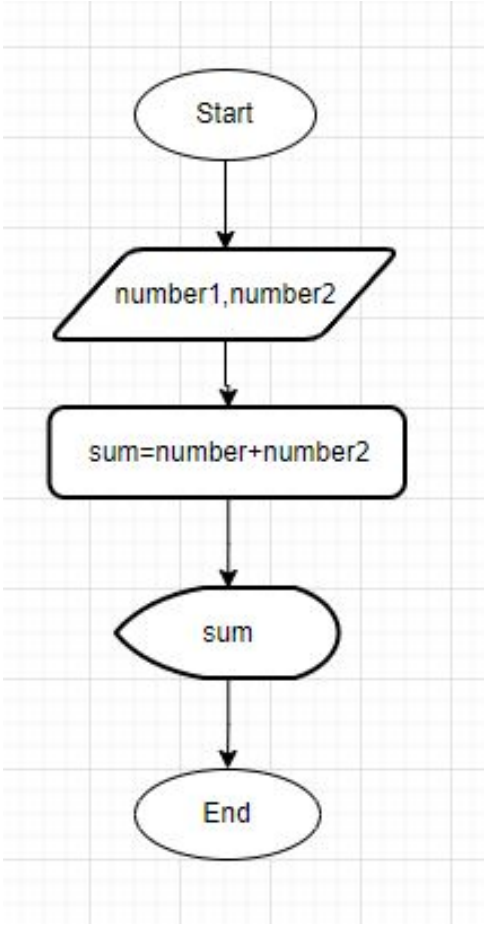
Example

START

INPUT number1 ,number2
sum=number1+number2

PRINT sum

END



Example

Takes a number and show is the number odd or even?

```
START
Input number
r=number mod 2
IF r==0
    print ‘even’
ELSE
    print ‘odd’
END
```

Example

Takes a number and show is the number odd or even?

START

Input number

r=number mod 2

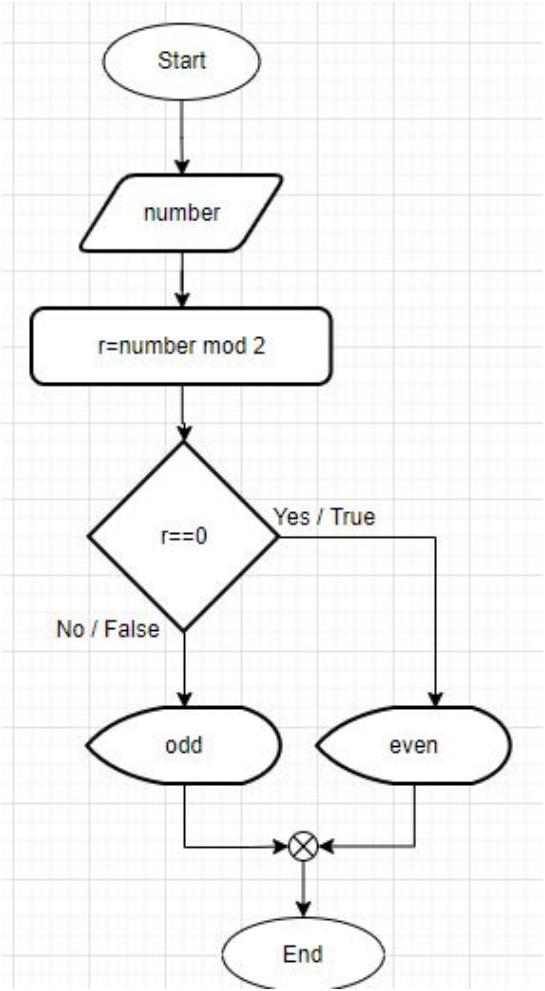
IF r==0

    print ‘even’

ELSE

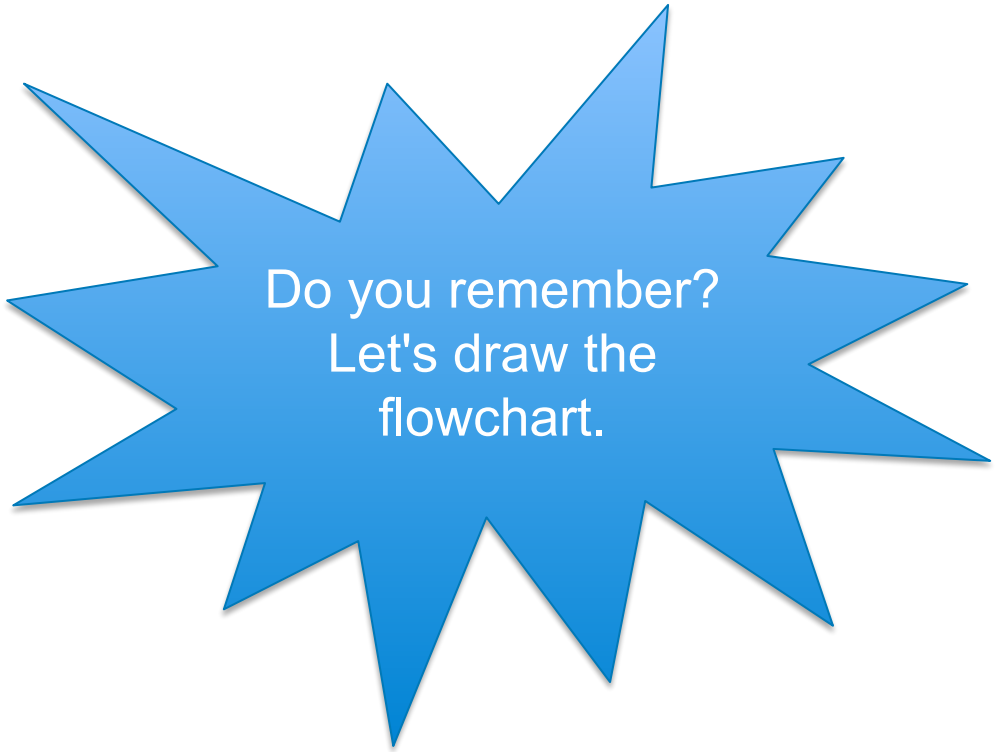
    print ‘odd’

END



Example

```
START
INPUT a,b,c
big=a
IF b>big
    big=b
IF c>big
    big=c
print big
END
```



Example

START

INPUT a,b,c

big=a

IF b>big

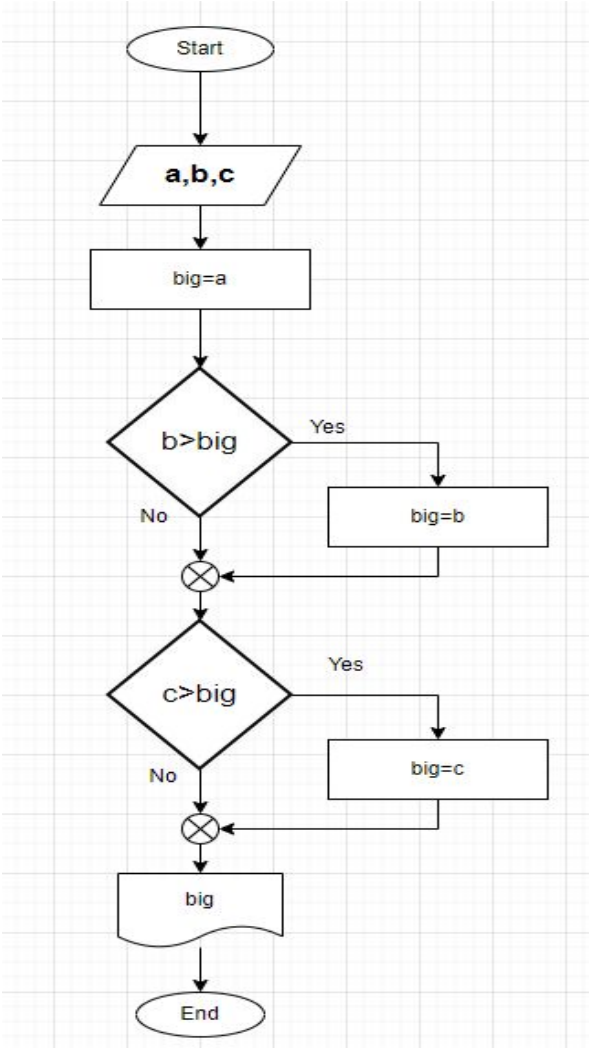
    big=b

IF c>big

    big=c

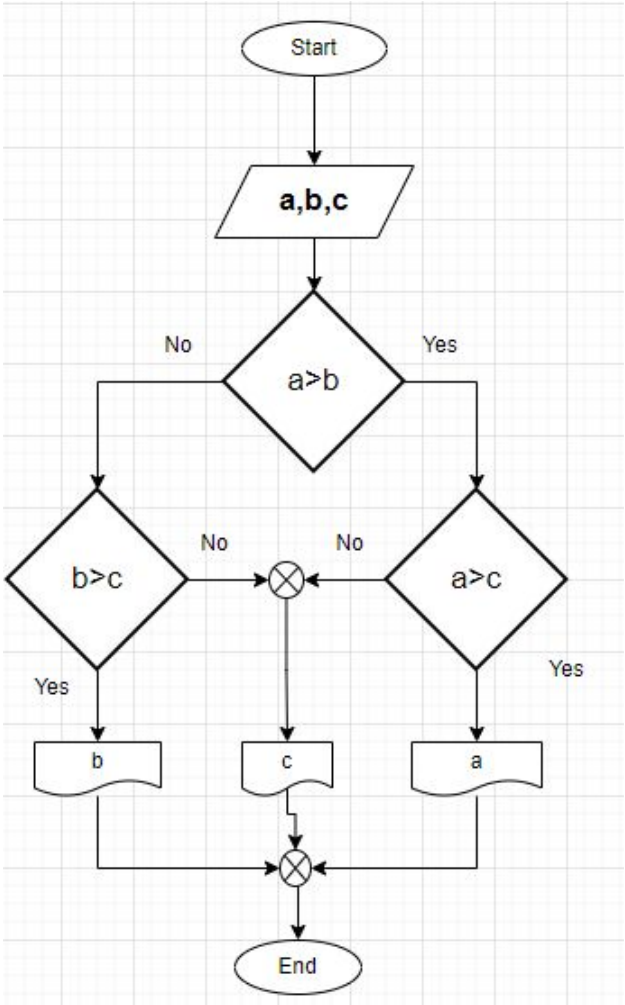
print big

END



Example

Another solution



Assignment

Calculate the shipping fee according to the information given in the table

distince	price multiplier by distance
0-500	50
500-1000	100
1000+	500

Assignment solution

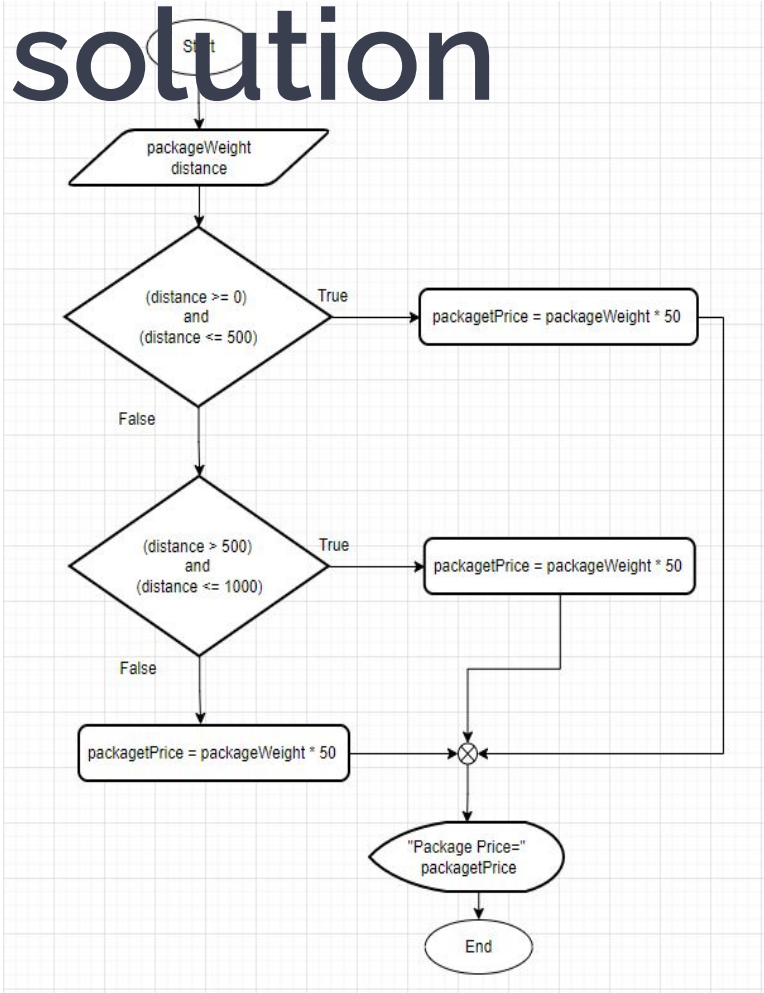
distince	price multiplier by distance
0-500	50
500-1000	100
1000+	500

```
START
packagetPrice, packageWeight, distance
INPUT " Enter Package Weight ", packageWeight
INPUT " Enter Distance ", distance
IF (distance >= 0) and (distance <= 500)
        packagetPrice = packageWeight * 50
ELSE IF (distance > 500) and (distance <= 1000)
        packagetPrice = packageWeight * 100
ELSE
        packagetPrice = packageWeight * 500
PRINT "Package Price=" + packagetPrice
END
```

Assignment solution

distince	price multiplier by distance
0-500	50
500-1000	100
1000+	500

START
packagetPrice, packageWeight, distance
INPUT " Enter Package Weight ", packageWeight
INPUT " Enter Distance ", distance
IF (distance >= 0) and (distance <= 500)
    packagetPrice = packageWeight * 50
ELSE IF (distance > 500) and (distance <= 1000)
    packagetPrice = packageWeight * 100
ELSE
    packagetPrice = packageWeight * 500
PRINT "Package Price=" + packagetPrice
END

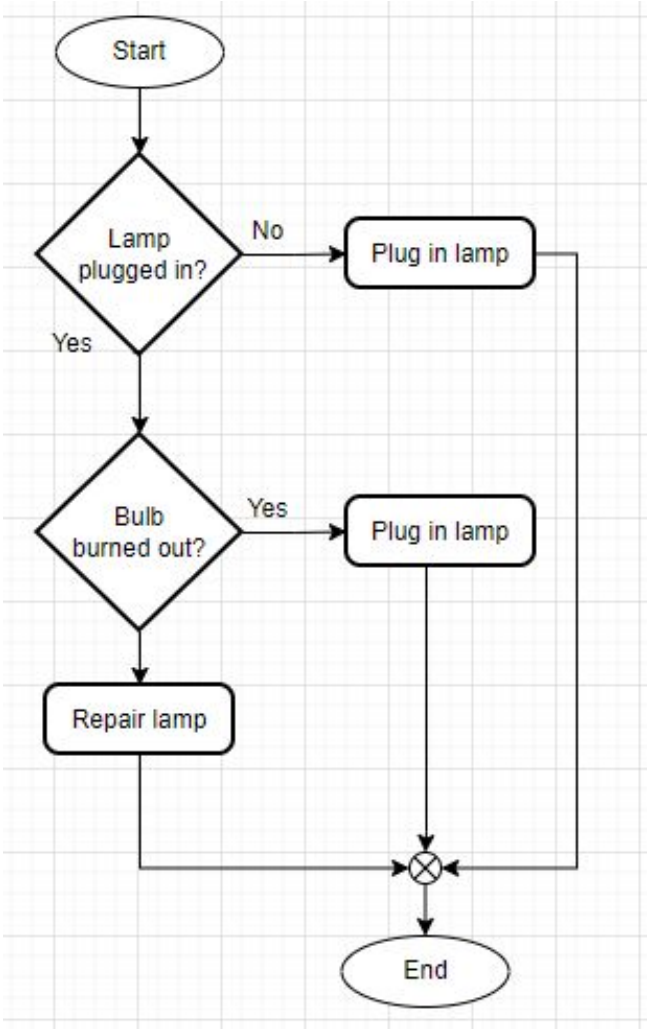


Example

```
START
IF lamp plugged in
        IF bulp burned out
                repair lamp
                GoTo end
        ELSE
                Plug in lamp
                GoTo end
ELSE
        plug in lamp
        go to end
END
```

Example

START
IF lamp plugged in
    IF bulp burned out
        repair lamp
        GoTo end
    ELSE
        Plug in lamp
        GoTo end
ELSE
    plug in lamp
    go to end
END



Login Diagram

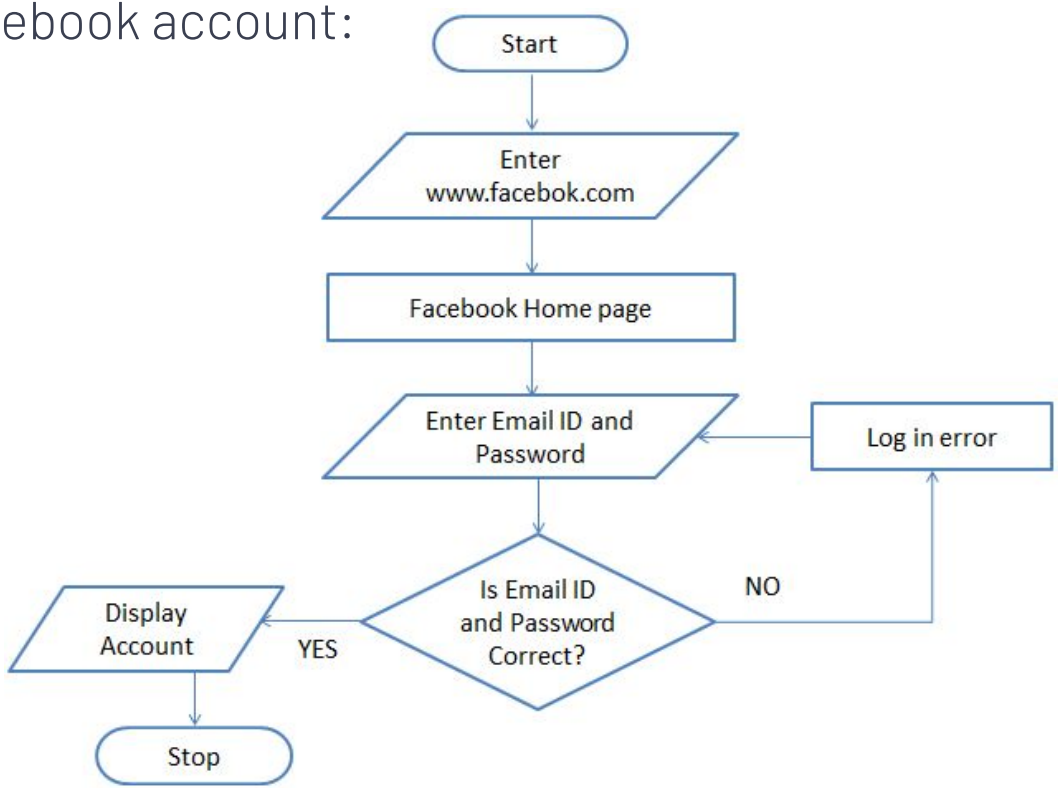
Draw a flowchart to login to your facebook account

Students, draw anywhere on this slide!

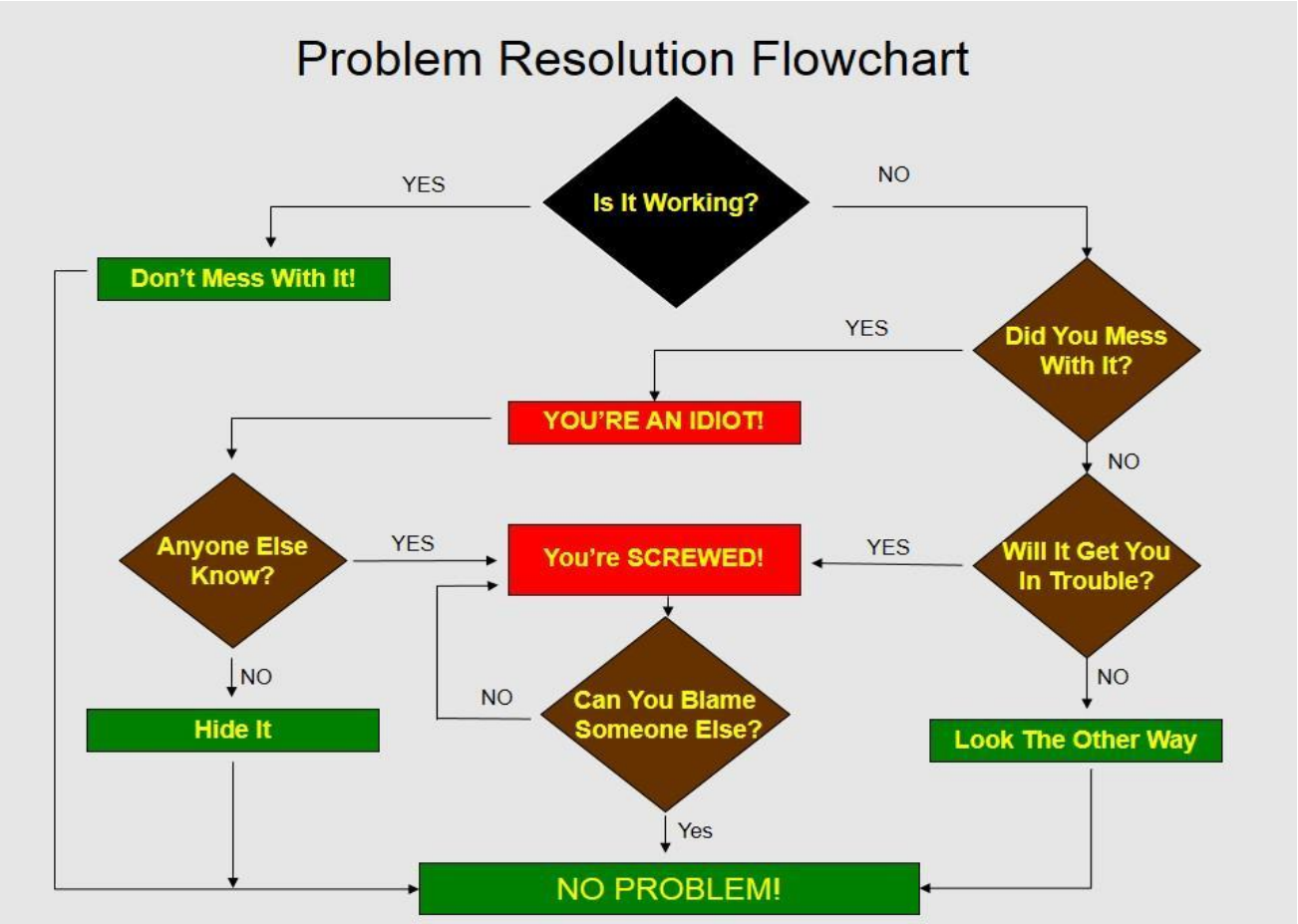
Pear Deck Interactive Slide
Do not remove this bar

Login Diagram

A flowchart to login to facebook account:

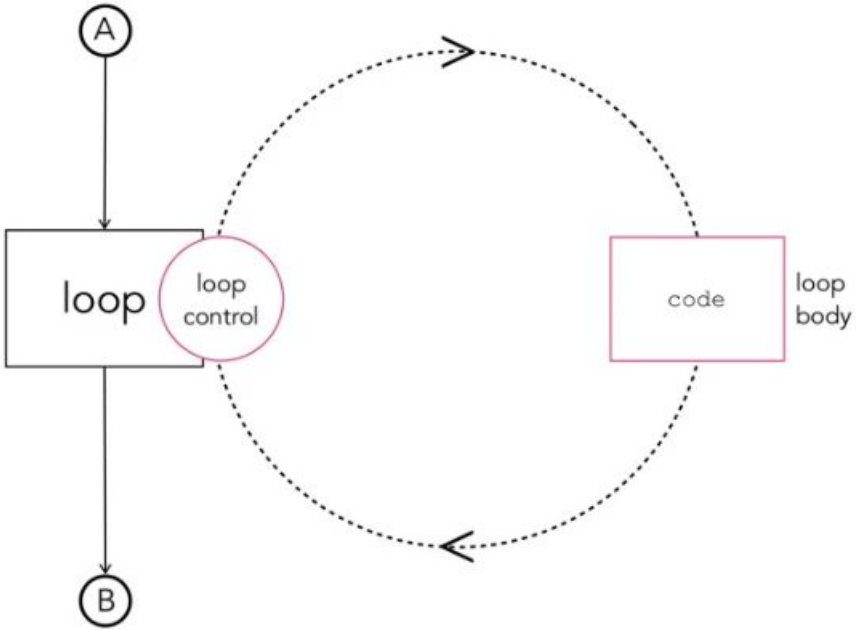


Flowcharts


Problem Resolution Flowchart
Is It Working?
YES
NO
Don't Mess With It!
Did You Mess With It?
YES
NO
YOU'RE AN IDIOT!
Anyone Else Know?
YES
You're SCREWED!
YES
Will It Get You In Trouble?
NO
NO
NO
Hide It
Can You Blame Someone Else?
Look The Other Way
Yes
NO PROBLEM!

LOOPS

A loop is a sequence of instruction s that is continually repeated until a certain condition is reached.



FOR structure

For loop runs for each element inside a group.

For example:

```
FOR every day of the week
    Count;
ENDFOR
```

FOR structure

For loop runs for each element inside a group.
For example:

For every 25 minutes of study

    Earn one Pomodoro;

endfor

Let's wash the dishes

Let's wash the dishes. Think that we have all the tools etc.

Let's wash the dishes

```
gather the dirty dishes
if you have a dishwasher around you
        put the dirty dishes inside the dishwasher
        set the settings of the dishwasher
        while the time set is not over
                wait
else
        while dishes are not clean
                take one of the dishes
                wash it with your hand
                dry it and put it aside
```

WHILE Structure

While is similar to the for loop, differently it runs the loop until the condition provided is unsatisfied.

Example:

```
Apples = 5
Oranges = 10
While apples < oranges
        increase apples;
endwhile
```

THANKS!

Any questions?