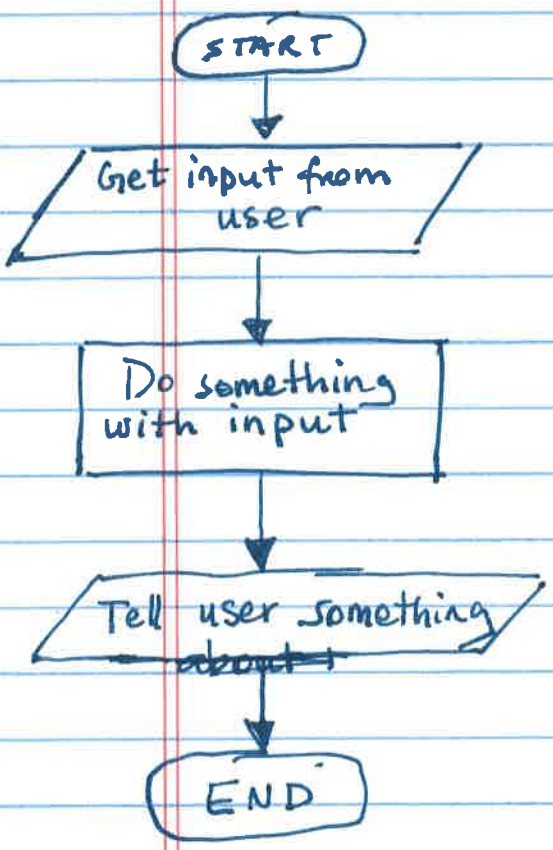
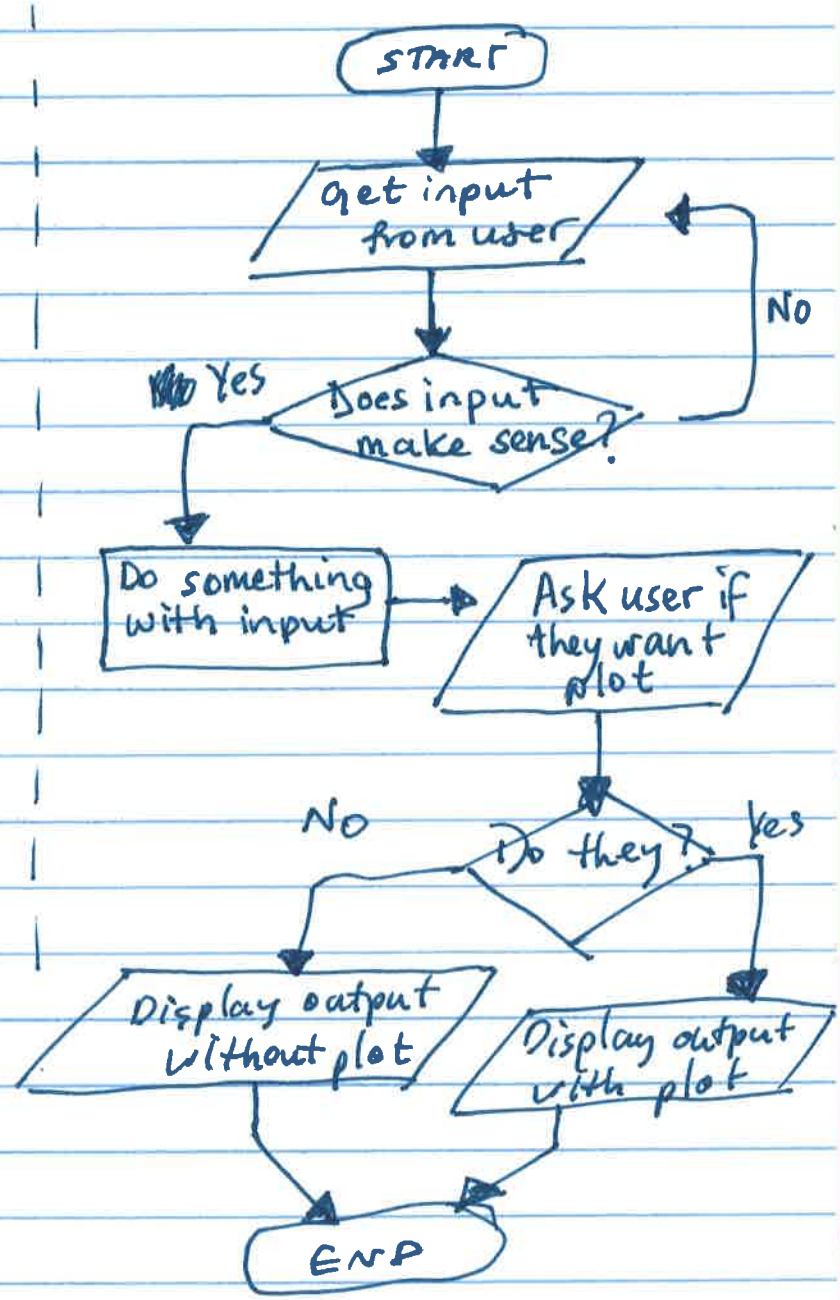
We need a way to control the flow of our programs to make them more complex and able to make decisions...

So far our programs look like this



Lets figure out how to make programs like this



RELATIONAL AND LOGICAL OPERATORS

LECTURE DATE : 3 OCT 16

So far all our programs have just been a collection of commands that will run in order.

Sometimes it is valuable to control the flow of a program but we need some way to make a decision on pathways...

Relational Operators

no space between <= etc

All math operations have precedence

<	Less than
>	Greater than
<=	Less than or equal
>=	Greater than or equal
==	Equal to
~=	Not equal to

QUESTION : why is equal 2 == and not just one?

Relational operators give us the ability to make decisions.

1 is TRUE 0 is FALSE

have them figure this out as activity

if two arrays are compared, done element by element
if scalar compared to array, compared to each element

Logical Operators

	name	description
&	AND	A & B operates on (A and B) IF both are true, result is true. Otherwise, false
|	OR	A|B operates on (A and B). IF either one, or both are true, the result is true. Otherwise both are false and result is false
~	NOT	~A operates on one operand. Gives the opposite

Order of Precedence:

1 (highest)	Parentheses. Innermost to outer
2	Exponentiation
3	Logical NOT (~)
4	Multiplication, division
5	Addition, subtraction
6	Relational operators
7	Logical &
8	Logical OR

Conditional Statements

As you will see in your homework, we can combine logical and relational operators to evaluate complex scenarios

example

```
>> apple = 10
>> banana = 10 + 3i
>> apple == banana   will evaluate false
```

we can use that to direct the traffic of our program

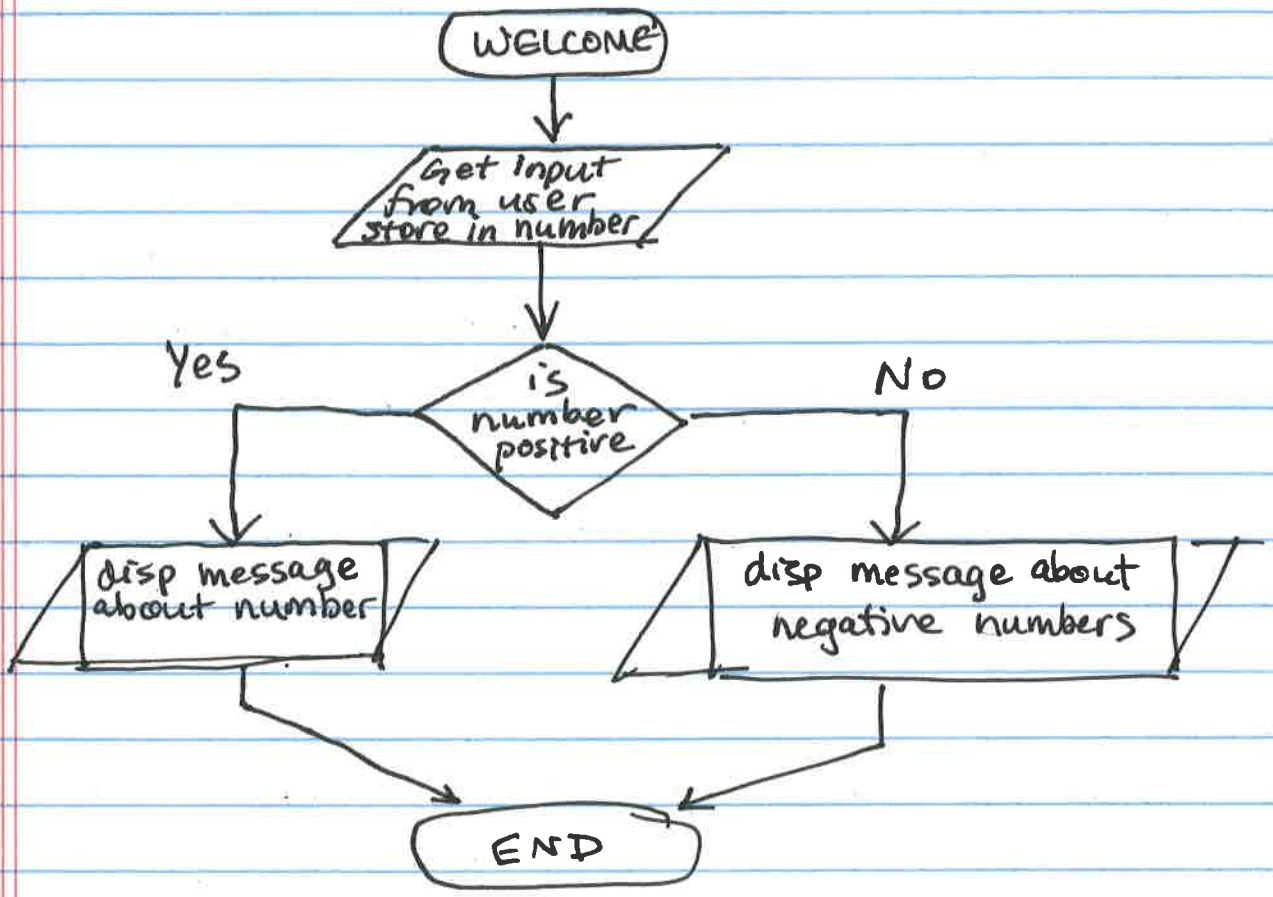
ex)

```
>> number = input('type in your fav number')
>> if number < 0
       disp('You like negative numbers? Cool!')
   if number > 0
       disp('That is a great number')
   if ~(number > 0) & ~(number < 0)
       disp('idiot')
```

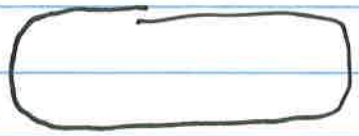
GREAT! But what if the user is an idiot and types in a letter...

Think about it we will get there next class.

SKETCHES ARE SUPER IMPORTANT FROM NOW ON! I WON'T HELP WITH HW UNLESS YOU HAVE A SKETCH



Standard symbols



START/END

ARROWS ARE CONNECTORS