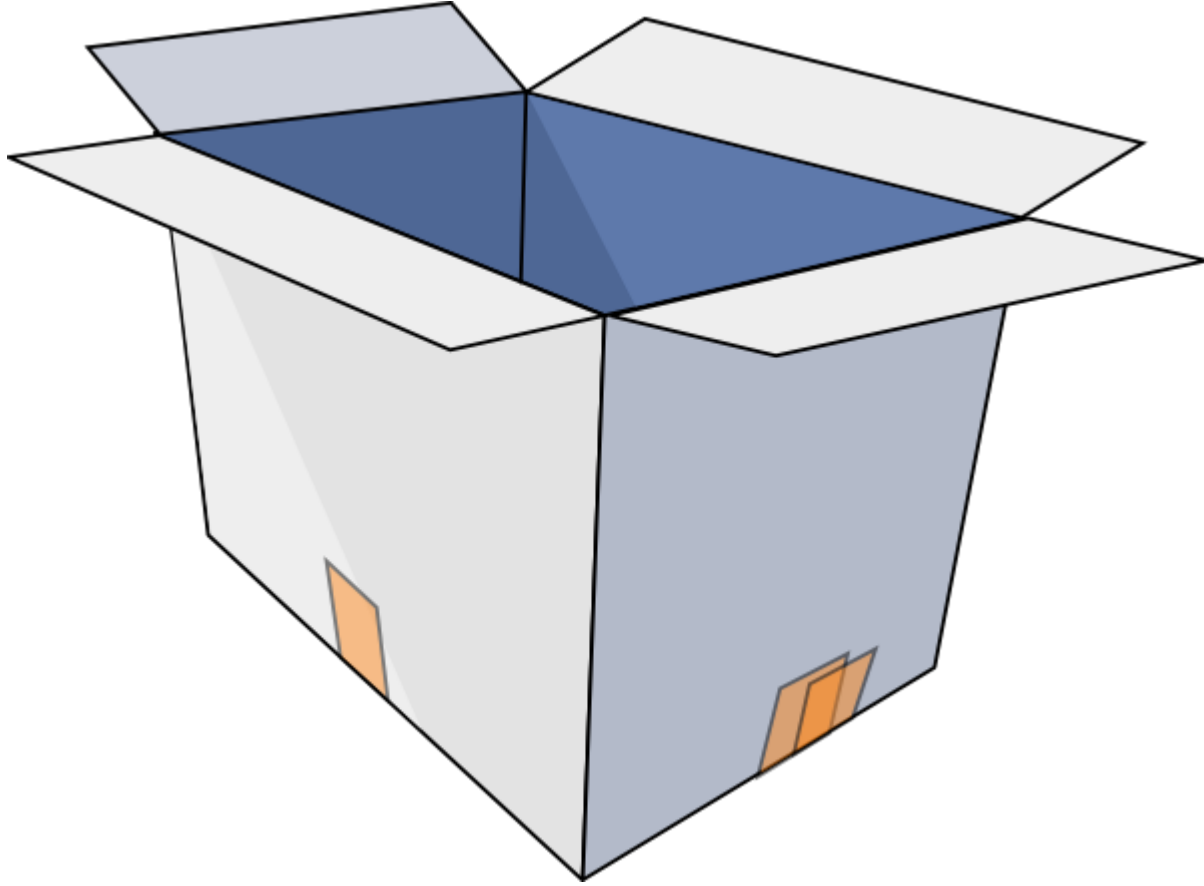


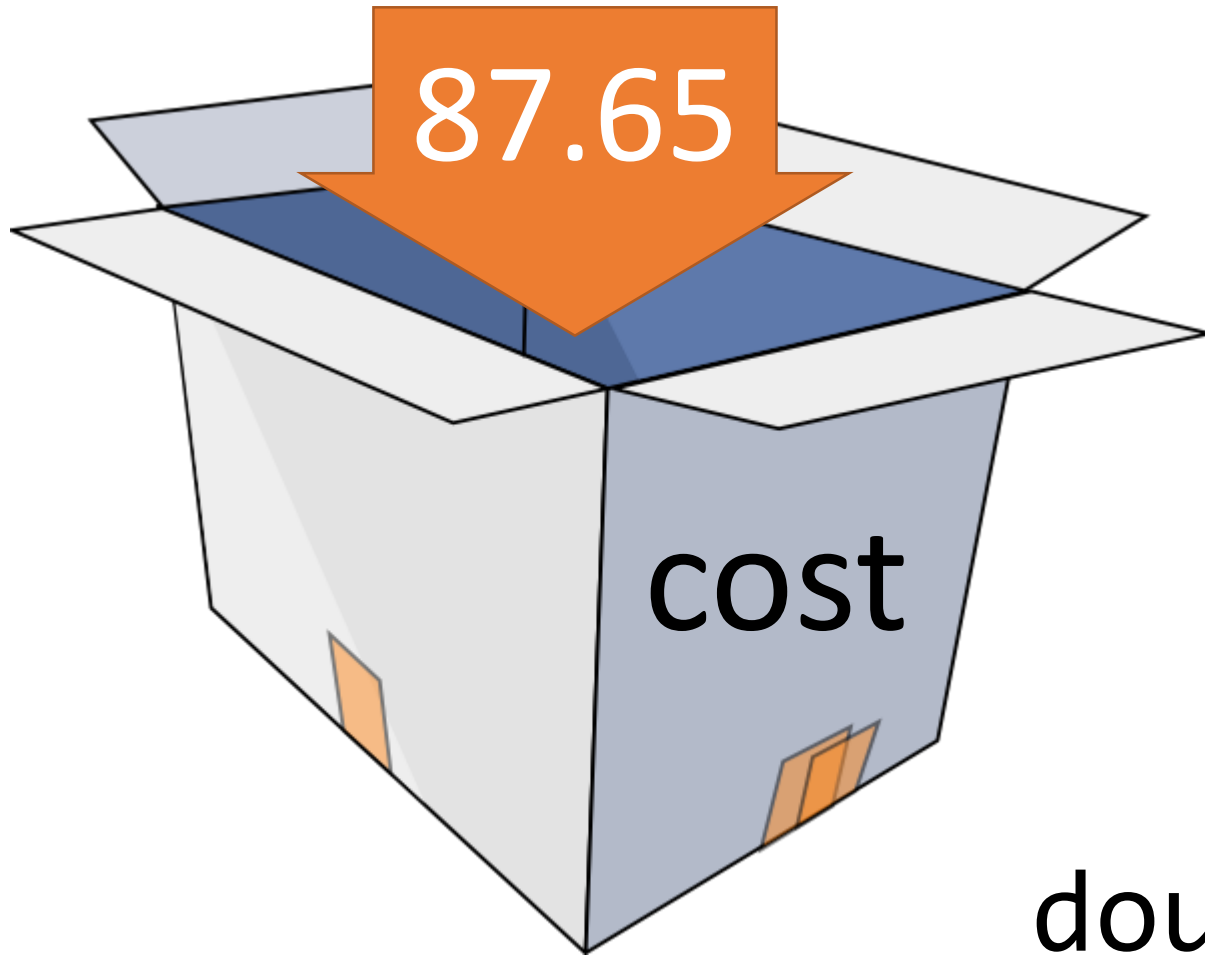
# Variables & Types

Which type? Which name?



A **variable** is used in programming to store a value until we need it again.

It is sort of like a box.



Variables have **names** so that you can call them again in your code.

```
double cost = 87.65;
```

# Java variables have types:

- A type is a kind of data – for example, words are text.
- A type is also an amount of RAM allocated to a variable.
- A type is also the kinds of operations that can be done with a variable.

## The Types

- in order of size. (Smallest to largest)

`boolean` – `true` or `false`

`char` – single characters, for example: `'a'`

`int` – integers, for example: `-2`, `0`, `67`

`double` – decimals, for example: `2.0`, `3.123`

`String` – text, for example: `"Hello"`

Example	Type?
apple	int, double, char, String
R	int, double, char, String
567	int, double, char, String
34.567	int, double, char, String
y	int, double, char, String
I like snow.	int, double, char, String
agorski@peelsb.com	int, double, char, String
905-453-9220	int, double, char, String

Example	Type?
apple	int, double, char, <b>String</b>
R	int, double, char, String
567	int, double, char, String
34.567	int, double, char, String
y	int, double, char, String
I like snow.	int, double, char, String
agorski@peelsb.com	int, double, char, String
905-453-9220	int, double, char, String

Example	Type?
apple	int, double, char, <b>String</b>
R	int, double, <b>char</b> , String
567	int, double, char, String
34.567	int, double, char, String
y	int, double, char, String
I like snow.	int, double, char, String
agorski@peelsb.com	int, double, char, String
905-453-9220	int, double, char, String

Example	Type?
apple	int, double, char, <b>String</b>
R	int, double, <b>char</b> , String
567	<b>int</b> , double, char, String
34.567	int, double, char, String
y	int, double, char, String
I like snow.	int, double, char, String
agorski@peelsb.com	int, double, char, String
905-453-9220	int, double, char, String



Example	Type?
apple	int, double, char, <b>String</b>
R	int, double, <b>char</b> , String
567	<b>int</b> , double, char, String
34.567	int, <b>double</b> , char, String
y	int, double, char, String
I like snow.	int, double, char, String
agorski@peelsb.com	int, double, char, String
905-453-9220	int, double, char, String

Example	Type?
apple	int, double, char, <b>String</b>
R	int, double, <b>char</b> , String
567	<b>int</b> , double, char, String
34.567	int, <b>double</b> , char, String
y	int, double, <b>char</b> , String
I like snow.	int, double, char, String
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y	int, double, <b>char</b> , String
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R	int, double, <b>char</b> , String
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y	int, double, <b>char</b> , String
I like snow.	int, double, char, <b>String</b>
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Example	Type?
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y	int, double, <b>char</b> , String
I like snow.	int, double, char, <b>String</b>
agorski@peelsb.com	int, double, char, <b>String</b>
905-453-9220	int, double, char, <b>String</b>

# Variables Types & Input

1.5  T

Name: \_\_\_\_\_

1. Classify each piece of input with the most appropriate type (int, double, String, char)

(a)	cat		(d)	235.3		(g)	I am Sam, Sam I am	
(b)	0.2344		(e)	5		(h)	L4V 5E6	
(c)	-89		(f)	K		(i)	(905)-453-9200	

Question	Type of answer?
How many chairs?	int, double, char, String
How much does it cost?	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday?	int, double, char, String
How old are you?	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost?	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday?	int, double, char, String
How old are you?	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String



Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday?	int, double, char, String
How old are you?	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday?	int, double, char, String
How old are you?	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday? (Sept 4)	int, double, char, String
How old are you?	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday? (Sept 4)	int, double, char, String
How old are you? (15)	int, double, char, String
What is your postal code?	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday? (Sept 4)	int, double, char, String
How old are you? (15)	int, double, char, String
What is your postal code? (L6W0A2)	int, double, char, String
What is your phone number?	int, double, char, String
What is your locker combination?	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday? (Sept 4)	int, double, char, String
How old are you? (15)	int, double, char, String
What is your postal code? (L6W0A2)	int, double, char, String
Phone number? (905-453-9220)	int, double, char, String
Locker combination? (34-56-02)	int, double, char, String

Question	Type of answer?
How many chairs? (32)	int, double, char, String
How much does it cost? (4.56)	int, double, char, String
Do you want to continue (y/n)?	int, double, char, String
What is your birthday? (Sept 4)	int, double, char, String
How old are you? (15)	int, double, char, String
What is your postal code? (L6W0A2)	int, double, char, String
Phone number? (905-453-9220)	int, double, char, String
Locker combination? (34-56-02)	int, double, char, String

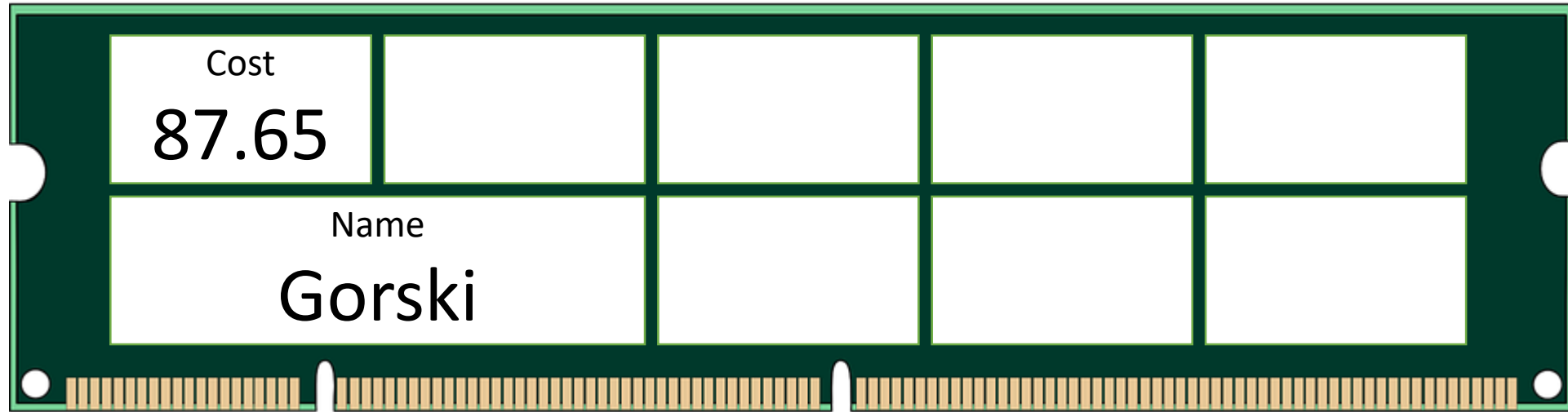
2. Fill in the table with information about each variable.

	Name	Type	Starting Value
<code>String fruit = "banana";</code>			
<code><u>int</u> <u>num</u>=2;</code>			
<code><u>boolean</u> <u>ans</u>=true;</code>			
<code>char <u>yORn</u>= 'y';</code>			
<code>double num2 =5.345;</code>			



3. Fill in the table with information about each variable.

	Name	Type	Starting Value
It will hold the number of apples the user wants to buy.			
It will hold the user's name.			
It will hold the user's postal code (eg. L6V 3F7)			



```
double cost = 87.65;
```

```
String name = "Gorski";
```

A **variable** is a space in RAM.  
It has a name, a value, and a type.

Its value can change whenever you want. Its name and type cannot.

**char**

*A f & \$ {*

*apple*

*(905) 453-9220*

*Frogs are green*

**String**

*0 1 2*

*3 4 5 6*

*7 8 9*

**int**

*-345*

*8965*

*-9*

**double**

*56.45*

*-3.14159*

*0.00006*



## Declaring

Declaring is creating a new variable

```
int num = 4;
```

```
String name = "Gorski";
```

```
double amt = 5.6778;
```

```
char ans = 'y';
```

```
double total = amt * 3;
```

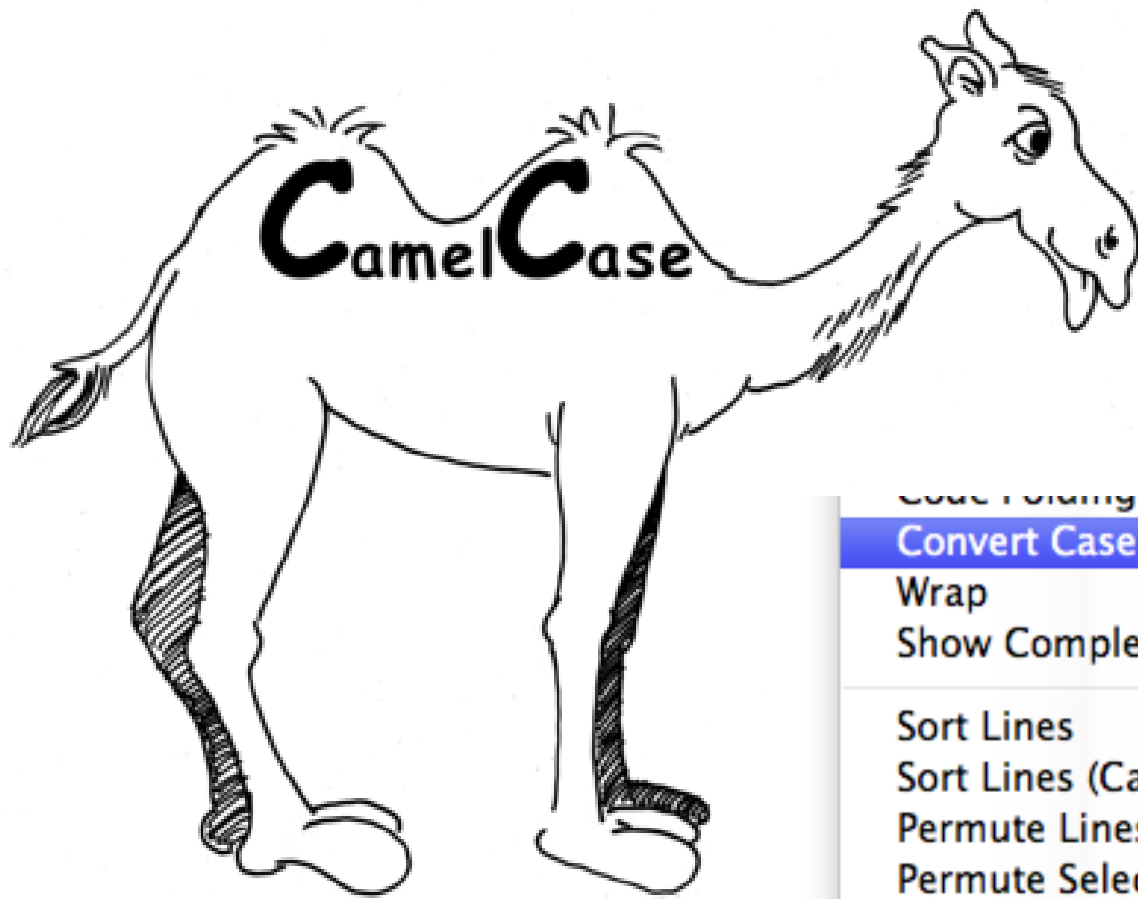
```
type name = starting value;
```

# Variable Naming Rules:

Because variables are used in the code, they have to be named carefully so the computer can understand.



1. No spaces. Camel case or underscores are fine.
2. Meaningful is easier in the long run.
3. Cannot start with a number. Otherwise, numbers are fine.
4. Cannot contain odd characters.
5. Cannot contain reserved words. (eg. public or main).  
These already have a purpose in java.



Code Folding			
Convert Case	►	Title Case	
Wrap	►	Upper Case	⌘K, ⌘U
Show Completions	^ Space	Lower Case	⌘K, ⌘L
		Swap Case	
Sort Lines	F5	snake_case	^⌘C, ^⌘S
Sort Lines (Case Sensitive)	^ F5	camelCase	^⌘C, ^⌘C
Permute Lines	►	PascalCase	^⌘C, ^⌘P
Permute Selections	►	dot.case	^⌘C, ^⌘D
		dash-case	^⌘C, ^⌘H
Special Characters...	⌘⌘T	separate_words	^⌘C, ^⌘W
		separate/with/slash	^⌘C, ^⌘/

# Which are valid variable names?

2many

impt\*

T or F

tallTree

yOrN?

chicken

## Naming Rules

1. No spaces.
2. Meaningful.
3. Cannot start with a number.
4. Cannot contain odd characters.
5. Cannot contain reserved words.

6. Which are valid variable names? Mark ☐ if it is a bad name and ☒ if it is a good one.  
(Variable names (1) have no spaces, (2) do not start with a number, (3) do not contain special characters)

frog	<u>greenFrog</u>	Eat bugs	great!
@name	cats2	2017	1stplace
Long word	5teams	Brampton	BCSS