

lecture_2_1:

Elementary Programming: variables

Programming as problem solving

So far, we have used Java to print things out. We have used it for some calculations, but nothing we can't do on a calculator. Now, we will start learning concepts that will enable us to formulate problems as programming problems.

Programming as problem solving

What is an algorithm?

"An algorithm describes how a problem is solved by listing the actions that need to be taken and the order of their execution."

It is a set of instructions to help plan a program.

It is a recipe.

Variables

```
int week = 1;
double profit = 736.0;
```

- Variables hold information and correspond to memory locations.
- The information they hold can change...usually
- Each variable has a:
 - type
 - size
 - name
 - value

Variables: type and size

Java variables can be of the following types and sizes:

type	size (bits)
byte	8
short	16
int	32
long	64
float	32
double	64

Variables: names

- Use descriptive variable names. Long names are okay.
- Lowercase variable names, unless more than one word. Then, combine all words into one, and capitalize the first letter of each subsequent word. For example:
 - camelCasedVariableName

Variables: values

Once it is declared, the value of a variable can change...

```
int week;  
week = 1;  
week = 2;
```

Variables: values

...unless it is a constant.

```
final int MAX_WEEKS = 5;
```

Constants also have different naming conventions.

- Prefaced with `final` keyword.
- All caps.
- Underscores between words.
