

Lecture 2: Datatypes and Variables

Curtin FIRST Robotics Club (FRC) Pre-season Training

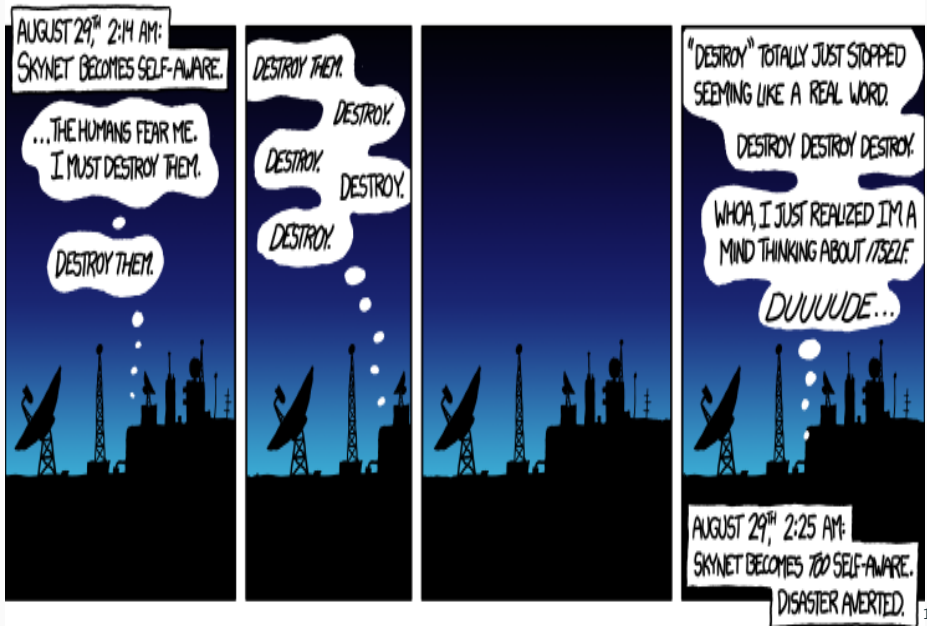
Scott Day

265815F@curtin.edu.au

October 29, 2016

Curtin University

Insert Mandatory Programming Joke



1. Data Types
2. Variables
3. Arithmetic Operators
4. Misc

Data Types

A C++ identifier is a name used to identify a variable, function, class, module, or any other user-defined item.

An identifier starts with a letter A to Z or a to z or an underscore (`_`) followed by zero or more letters, underscores, and digits (0 to 9).

C++ does not allow punctuation characters such as `,` `$`, and `%` within identifiers. C++ is a case-sensitive programming language. Thus, `Manpower` and `manpower` are two different identifiers in C++.

Reserved Words

C++ has a whole table of reserved words (also known as keywords).

Since they are used by the language, these keywords are not available for re-definition or overloading.

The following list contains some of the reserved words you might come across:

and	auto	bool	break
case	catch	char	class
const	continue	default	delete
do	double	dynamic_cast	else
enum	export	extern	false
float	for	if	int
import	long	module	mutable
namespace	new	private	protected

The full list with explanations can be found at cppreference.com

C++ has several built-in as well as user defined data types to choose from.
some of the basic C++ data types are:

Type	Keyword	Width	Range
Boolean	bool	1 Byte	true, false
Character	char	1 Byte	-128 to 127 or 0 to 255
Integer	int	4 Bytes	-2,147,483,648 to 2,147,483,647
Floating point	float	4 Bytes	$\pm 3.4 \cdot 10^{\pm 38}$ (~7 digits)
Double floating point	double	8 Bytes	$\pm 1.7 \cdot 10^{\pm 308}$ (~15 digits)
Valueless	void		

t

Variables

t

t

t

Arithmetic Operators

t

t

Misc

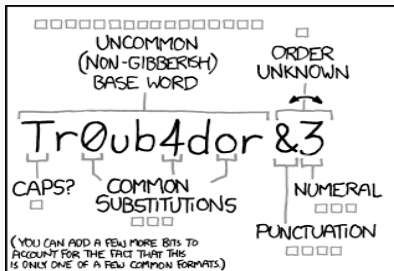
t

Expressions with Mixed Variable Types (Type Casting)

t

t

Check this out



~28 BITS OF ENTROPY

$2^{28} = 3 \text{ DAYS AT } 1000 \text{ GUESSES/SEC}$

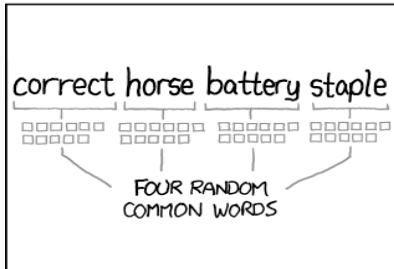
(PLAUSIBLE ATTACK ON A WEAK REMOTE WEB SERVICE. YES, CRACKING A STOLEN HASH IS FASTER, BUT IT'S NOT WHAT THE AVERAGE USER SHOULD WORRY ABOUT.)

DIFFICULTY TO GUESS: **EASY**

WAS IT TROMBONE? NO, TROUBADOR. AND ONE OF THE 0s WAS A ZERO?

AND THERE WAS SOME SYMBOL...

DIFFICULTY TO REMEMBER: **HARD**



~44 BITS OF ENTROPY

$2^{44} = 530 \text{ YEARS AT } 1000 \text{ GUESSES/SEC}$

DIFFICULTY TO GUESS: **HARD**

THAT'S A BATTERY STAPLE.

CORRECT!

DIFFICULTY TO REMEMBER: YOU'VE ALREADY MEMORIZED IT

THROUGH 20 YEARS OF EFFORT, WE'VE SUCCESSFULLY TRAINED EVERYONE TO USE PASSWORDS THAT ARE HARD FOR HUMANS TO REMEMBER, BUT EASY FOR COMPUTERS TO GUESS.

