

Defuse the Bomb

A CSC 102 Project

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# BOMB DEFUSAL MANUAL

Version 1

Verification Code: 0xDEADBEEF

## The Game

This project is based on the game **Keep Talking and Nobody Explodes**<sup>1</sup>, a cooperative bomb defusing party game. As the game designers put it, “You’re alone in a room with a bomb. Your friends, the 'Experts', have the manual needed to defuse it. But there’s a catch: the Experts can’t see the bomb, so everyone will need to talk it out – fast! Put your puzzle-solving and communication skills to the test as you and your friends race to defuse bombs quickly before time runs out!”

Their version is a software game. Our version takes the idea and realizes it as a physical device with buttons, switches, and more! The backend is a Raspberry Pi<sup>2</sup> computer that combines a typical computer with the ability to interact with the outside world through sensors. The underlying software is written in Python<sup>3</sup> and is the result of a final group-based project in CSC 102 (The Science of Computing II) in the Computer Science Program at the University of Tampa.

## Defusing Bombs

The bomb will “explode” when its countdown reaches 0:00 or when too many strikes have occurred. You defuse the bomb by disarming all of its “phases” before the countdown expires.

### Phases

The bomb has **four** phases, each of which must be disarmed to defuse the bomb. **The phases can be disarmed in any order.** Instructions for disarming the phases are provided in this document.

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<sup>1</sup><https://keeptalkinggame.com/>

<sup>2</sup><https://www.raspberrypi.com/>

<sup>3</sup><https://www.python.org/>

### **Strikes**

A mistake in disarming a phase results in a strike. Get too many strikes, and the bomb “explodes”.

### **Hint button**

The hint button will allow you to get a hint if you have more than 2 strikes left. It will cost you two strikes instead of one.

### **Information**

A different version of the bomb is randomly presented each time it is “booted”. In total, 6,300 versions of the bomb are possible making up 1,102,500 unique variations!

Disarming some phases will require specific information about the bomb. Pay close attention to the “bootup” text on the bomb's screen.

## Regarding the Toggles

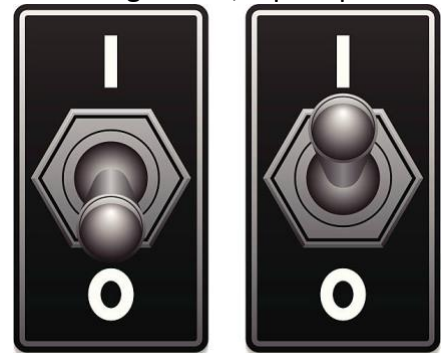
The toggles phase will disarm once switched on (flipped up) in a certain order. Look at the serial number located on the bootup screen. Add up all the numbers in the serial number to get the target value for the toggles. Next, convert the number to base 10.

### Converting from Base 10 to Binary

The numbers you are used to are called base 10, which means it uses digits 0-9. Binary only uses 0s and 1s. To convert a number to binary, look at the table listed below with the values. When given a base 10 number, you want to find the values from the table that add up to the number you are given. For the numbers you used, replace with a 1. For the numbers you did not use, replace with a 0. The most significant number is on the left. For example, 3 in base 10 is 0011 in binary.

Binary Values	8	4	2	1
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Once you convert from base 10 to binary, look at the toggles. The left most digit corresponds with the left most toggle. If the digit is a 0, flip down the switch. If the digit is a 1, flip it up.



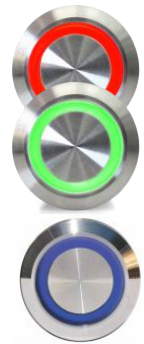
## Regarding the Button

The color of the button will determine what you must do to disarm it. The ring around the button will be red, green, or blue. Use the instructions below to defuse it.

**Red:** Press and release at anytime

**Green:** Look at the serial number. Release the button when the first digit of the serial code matches one of the digits that appears in the seconds on the timer.

**Blue:** Look at the serial number. Release the button when the last digit of the serial code matches one of the digits that appears in the seconds on the timer.



## Regarding the Keypad

To unveil the correct passcode, first, you must decrypt the code. In the bootup text, there is a crypted word. There is a decipher key that tells you how many spaces the alphabet has been shifted. A key of 3 results in A becoming D, B becoming E, etc. For example, with a shift of 3, “TEA” is crypted to “WHD”, and decrypting “WHD” gives you “TEA”.



Once the decrypted word is found, look at the key for the corresponding passphrase. Enter the passphrase into the keypad, pressing the button once for each letter.

Keyword	Riddle	Keyword	Riddle
BANDIT	What gets wet while drying?	MIGHTY	What five-letter word becomes shorter when you add 2 letters to it?
BUCKLE	You walk into a room that has a match, a candle, a kerosene lamp, and a fireplace. What do you light first?	NATURE	What five-letter word has one left when you remove two letters?
CANOPY	What has many keys but can't open a single lock?	REBORN	What fills up a room but takes up no space?
DEBATE	David's parents have three kids. Harry, Joe, and what is the name of the third?	RECALL	You make me, save me, change me, and raise me. What am I?
FIERCE	What has hands but can't clap?	SYSTEM	What word is always spelled wrong?

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GIFTED	What has legs but doesn't walk?	TAKING	What has a thumb and four fingers, but is not a hand?
IMPACT	What runs around the backyard but never moves?	WIDELY	What can travel all around the world without leaving its corner?
LONELY	I am an odd number. Take away a letter and I'm even. What number am I?	ZAGGED	A girl goes to the store and buys one dozen eggs. As she is going home, all but three break. How many eggs are left unbroken?



## Regarding the Wires

The wires are labeled A, B, C, D, and E going from top to bottom. The correct ones must be “cut” (unplugged) to complete the phase. The color of the wires does not matter.

Button Color	Instructions
Red	Look at the first 3 letters in the serial number. Keep the wires that correspond with those letters plugged in.
Green	Disconnect all wires except “B” and “E”.
Blue	Keep “B” and “C” plugged in.

## Riddle Answers

Riddle	Answer	Riddle	Answer
What gets wet while drying?	TOWEL	What five-letter word becomes shorter when you add 2 letters to it?	SHORT
You walk into a room that has a match, a candle, a kerosene lamp, and a fireplace. What do you light first?	MATCH	What five-letter word has one left when you remove two letters?	STONE
What has many keys but can't open a single lock?	PIANO	What fills up a room but takes up no space?	LIGHT
David's parents have three kids. Harry, Joe, and what is the name of the third?	DAVID	You make me, save me, change me, and raise me. What am I?	MONEY
What has hands but can't clap?	CLOCK	What word is always spelled wrong?	WRONG
What has legs but doesn't walk?	TABLE	What has a thumb and four fingers, but not a hand?	GLOVE
What runs around the backyard but never moves?	FENCE	What can travel all around the world without leaving its corner?	STAMP
I am an odd number. Take away a letter and I'm even. What number am I?	SEVEN	A girl goes to the store and buys one dozen eggs. As she is going home, all but three break. How many eggs are left unbroken?	THREE