## Week 01

### Part 1 Morse De-Code

Welcome to your first day aboard the STS Space Ghost, where you’ll be venturing into the vastness of space for the very first time. After settling into your cabin, your next stop is to meet with the Officer on Deck who will provide you with your inaugural job assignment.

To your surprise, you find yourself entrusted with the important task of communications decoding in the Communications Bay, despite your limited experience in the field. Fortunately, a stroke of luck comes your way when you recall that a significant portion of space communication is conducted using Morse Code.

Although you’ve heard of Morse Code in passing, your understanding of it is a bit hazy. With a sense of urgency, you frantically search your desk drawer, and lo and behold! Serendipity leads you to a weathered booklet with yellowing pages with the title “Deciphering Morse Code”. Inside, you discover a comprehensive table containing Letter to Morse Code translations, along with a detailed guide on how your machine interprets the input code:

|  |  |
| --- | --- |
| * Letters in the words will be separated by spaces * Words will be separated by new lines (\n) * Dots (dits) will be represented with decimal characters (.) * Dashes (dahs) will be represented with underscore characters (\_) * Dots and dashes for each letter or character will not have spaces between them | |
| (morse code table) | This table shows the corresponding code for each letter or symbol with spaces between each dot or dash for ease of viewing. Remember, as per the rules of input, the actual input will not contain spaces between the dots and dashes for a single character.  ⭐︎ Additional symbols and numerical digits are not required for this challenge but can be included in your solution if you would like. |

### Part 2 Something Alien

Just as you translate the question received, another source has sent a reply. This must be the answer to the question previously asked, but the contents of the new message cause your script to error. This is not Morse Code. This looks instead like something alien.

Rather than panic and run to your supervisor, you set your mind toward solving this problem on your own. You re-read your Morse Code booklet to no avail and open your desk drawer to see if there might be anything else in there that could be of use… Nothing.

Sighing heavily and putting your head in your hands, you catch a glimpse of a poster on the wall beside your monitor which you hadn’t noticed before. It’s titled, “O.B.M.T. for Alien Communication” and it reads:

1. Convert each character to its Ordinal (Unicode code points)
2. Concatenate those numbers to one large integer, then convert that number to Binary
3. Convert the Binary number into Morse Code by considering the 0s dits and the 1s dahs.
4. Convert the Morse Code to Text

Underneath the fourth step there’s a footnote:

* Alien communication is always only one word. Each received alien transmission begins with three Exclamation Marks at the start and end of the message with an additional exclamation mark between each letter.

## Week 02

### Part 1 What a Mess!

You awake, ready to start a new day. Your holographic tablet dings, displaying a message:

Rise and shine, Cadet! Due to your exemplary performance in the Comm Bay, we are assigning you to the Electrical Control Room. Report there at 0800 hours.

When you arrive, the room is in chaos with the crew grabbing at piles of loose paper from the completely covered floor. The pages seem to be from an instruction manual of sorts. Someone sees you standing there and tells you to grab some paper and sort them, leaving before you can ask any questions. So, you grab a pile.

The sheets of printed paper do not have page numbers, but they all have a header printed at the top:

Section Title, Chapter Number, Subchapter Letter, Section Number

You decide to sort the pages like any book — first by chapter, then by subchapter, then by section. Each section sorted in ascending order.

When everyone is done sorting their piles, you assume you will have to work together to combine all your piles into one, so you decide to create a mnemonic out of the section titles to help you contribute to this collaboration.

### Part 2 BrailLED

Now that that’s all sorted, no pun intended, it’s time to get to work. The stress of this new assignment caused by the chaos of the paper storm has left you feeling like the Electric Control Room is not the place for you. You should put in a Change of Assignment request with the Operations Manager, but you’ve left your holographic tablet in your bunk. That’s ok because aboard the ship, all devices have the capability of communicating with the Operations Manager, provided there’s a screen to display the reply. Luckily for you, you’re stood in front of the “Binary Represented All-Inclusive Lettering LED” System, or “BrailLED” for short.

The BrailLED is long strip of LED lights with six rows and fifty-two columns. Transmissions are sent to the LED lights as a packet of tuples. The first item of the tuple is a binary string and the second is a column header. The columns are assigned from left to right the sorted uppercase letters A-Z followed by the sorted lowercase letters, a-z. The binary string fills its respective column from top to bottom, assigning the individual lights in that column ON for 1 or OFF for 0. The resulting LED display is a 2 row, 26 column strip of 3x2 light groupings, each grouping representing one letter in braille.   
Someone must have bumped the BrailLED amidst all the confusion this morning, because the inputs are not coming in sorted. You will have to sort the inputs first before letting the LED display show you your message in braille.

## Week 03

### Part 1 Stop, Dock, and Roll

Today you head to the Cargo Hold to start your next assignment. The room is brightly lit in a white light, and you can see thick tubes and chutes cris-crossing the walls and tall ceiling. Immediately center, you see a row of 40 giant capsule-filled tubes with an opening for each at the very top and at the front of the bottom, like upside-down PEZ dispensers. Beside this dispensing system, bolted to the floor is a large robotic arm, nearly as tall as the ceiling with spherical grips at the end of its long arm.

You’re greeted by the supervisor of the Cargo Hold, who has a kind voice and an even kinder smile. She explains to you what you need to do:

The spherical capsules inside these tubes are all different kinds of cargo. They are heavy metallic balls studded with rivets and embellishments. To tell them apart, most of the capsules are painted with a large bright red character (either alphabetical, or a punctuation symbol). The ones that lack any marking are all the same item, so it might be helpful to think of them as a space character rather than as nothing.

What’s inside them? She has no idea. She just gets a request from somewhere and runs the machine to fulfill it. Requests come on a piece of paper with two sections. The first line of the request is a number from 0 to 39 which indicates what dispenser to set the machine to start at. The next line on the paper is a long series of commands for the robotic arm, separated by commas. Each command either begins with a R, L, T, or D, followed by a number.

When the machine gets an R or an L command, the robotic arm moves its position either **Right** or **Left** the number of places indicated by the number. For example, “R3” would move the robotic arm 3 places to the right.

When the machine gets a T command, it **Takes** a capsule from the dispenser at its current position. The robotic arm pulls a single capsule from the dispenser, letting the remaining capsules descend to fill the empty space. That capsule is then vacuumed into an attached C-shaped tube where capsules are stored, always inserting itself into the front of the tube. For example, if the command is “T5”, the arm will take “A” from the current dispenser, then “B”, “C”, “D”, and “E”. Those capsules are stored in the tube in the order [E, D, C, B, A].

When the machine gets a “D” command, it **Drops** the specified number of capsules into the top of the dispenser it’s currently facing. Because of the C-shaped tube, capsules are dispensed from the opposite end of the tube, one at a time. For example, if the command is “D3” and the robot arm’s tube contains the [E, D, C, B, A] from before, it will drop “A” into the dispenser, then “B”, then “C”.

One last thing. The scanner is broken so you need to manually control the machine while following the instructions. Otherwise, she says, she could easily do this by herself, but now that you’re here, it will be a great help. Thank you very much. Once the order is complete, you press the “release” button and one capsule from each dispenser rolls out from the bottom, in order, onto the delivery cart to be shipped to the appropriate department of the ship.

### Part 2 Blunder Belt

Stop, stop, stop, stop! You see the supervisor running at full speed out of her office, frantically waving her arms. When she gets to you at the robot arm, she pauses to catch her breath, then tells you:

She’s forgot to tell you the most important step! Each time the robot arm receives a **T**ake command, after taking the correct number of capsules from the dispenser, you must push the “shift” button. This button activates a conveyor belt under all the dispensers, shifting their contents one space to the left. The contents of dispenser 12 are now in dispenser 11, the contents of dispenser 1 are now in dispenser 0, etc. The contents which were in dispenser 0 are now displaced all the way to the end at dispenser 39. The shift happens internally, and the robotic arm position is not affected by this change. If the arm’s position is 19, it remains 19 despite the contents of dispenser 19 changing. Nothing happens after commands for **R**ight, **L**eft, or **D**rop, only after **T**ake commands.

She pushes a big red reset button which empties the dispensers and fills them back up again with their predetermined order. Now you can start again, she says, and hands you a new command sheet.

## Week 04

### Part 1

### Part 2

## Week 05

### Part 1

### Part 2

## Week 06

### Part 1

### Part 2

## Week 07

### Part 1

### Part 2

## Week 08

### Part 1

### Part 2

## Week 09

### Part 1

### Part 2

## Week 10

### Part 1

### Part 2