Morse Code Assignment

Use an Arduino along with additional components to build a circuit that allows a user to input a word in Morse code and display it on serial monitor as shown in figure 2. While pressing the push button, a blue LED should flash showing that the system is capturing the Morse code. If at any point the sketch cannot decipher the Morse code, then "wrong input" is shown on serial monitor and a sound is played on a buzzer while a red LED is switched on for the duration of the sound. Use the components below to construct your circuit.

Pre-requirement:

Hardware

- Arduino Uno,
- Push button
- USB cable,
- Jumper cables
- Breadboard.
- Blue and Red LEDs
- Resistor
- Buzzer

Software

- Arduino IDE
- 123D circuit, this software allow use to simulate the circuit (https://www.tinkercad.com)

Use the Morse code fact sheet in Figure 1 to understand the translation from Morse code to alphabet.
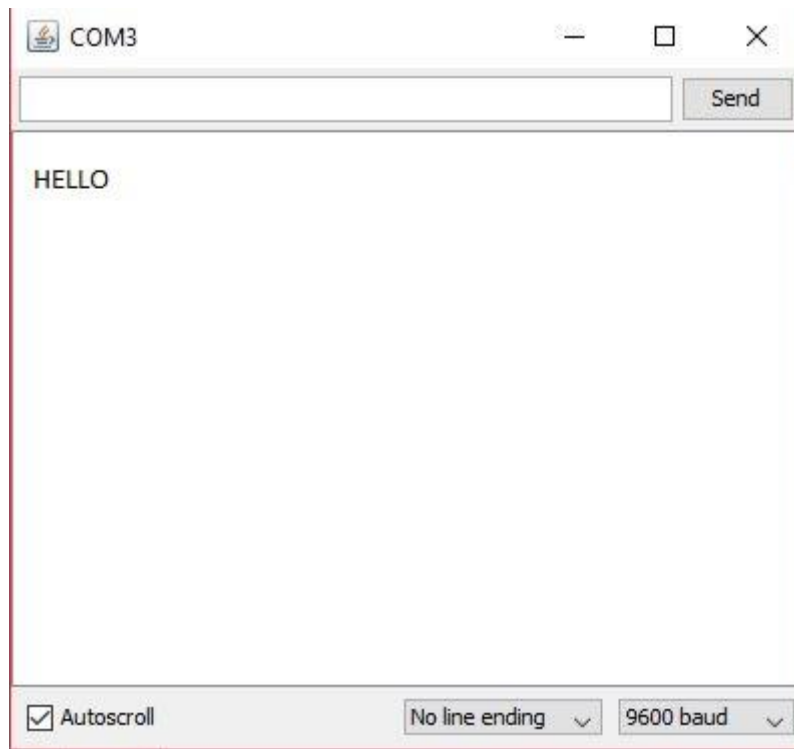
International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.

A ● ▬
B ▬ ● ● ●
C ▬ ● ▬ ●
D ▬ ● ●
E ●
F ● ● ▬ ●
G ▬ ▬ ●
H ● ● ● ●
I ● ●
J ● ▬ ▬ ▬
K ▬ ● ▬
L ● ▬ ● ●
M ▬ ▬
N ▬ ●
O ▬ ▬ ▬
P ● ▬ ▬ ●
Q ▬ ▬ ● ▬
R ● ▬ ●
S ● ● ●
T ▬

U ● ● ▬
V ● ● ● ▬
W ● ▬ ▬
X ▬ ● ● ▬
Y ▬ ● ▬ ▬
Z ▬ ▬ ● ●

1 ● ▬ ▬ ▬ ▬
2 ● ● ▬ ▬ ▬
3 ● ● ● ▬ ▬
4 ● ● ● ● ▬
5 ● ● ● ● ●
6 ▬ ● ● ● ●
7 ▬ ▬ ● ● ●
8 ▬ ▬ ▬ ● ●
9 ▬ ▬ ▬ ▬ ●
0 ▬ ▬ ▬ ▬ ▬

Figure 1

Morse data sheet downloaded from: https://en.wikipedia.org/wiki/Morse_code

The result will be display on the Serial monitor as shown below:

You are required to submit the following:

1. **A report including the following (11%)**:
   - The design of the IoT circuit using 123D Circuit site
   - Building the actual IoT device which reflects the design
   - Write the pseudocode for the sketch program
   - Implement the sketch

2. **A short video (less than 3 mins) that the device you have built is working properly (4%)**.

You will be assessed on the following criteria:

- Building and testing circuit on 123D circuit, available at: https://www.tinkercad.com/circuits (2%)
- Building the actual IoT device (3%)
- Pseudocode for sketch (2%)
- Sketch (4%)
- Video of the IoT device responding to input and displaying values on serial monitor (4 %).

[Total: 15%]