Oh, Susannah

Time required: 60 minutes

Please read all the directions carefully before beginning the assignment.

- Comment your code as shown in the tutorials and other code examples.

- Follow all directions carefully and accurately.

- Think of the directions as minimum requirements.

Description

The following music program plays a part of Oh, Susannah, a common folk song.

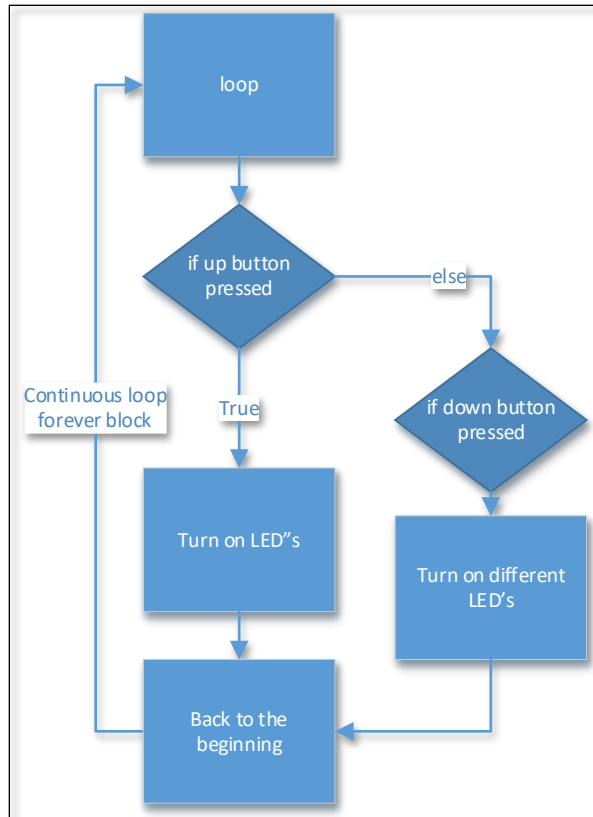## Understanding

Demonstrate understanding of:

Debounce, playing music, if then else decisions

Knowledge Point

Debounce: When an IR remote button is pressed, it may make contact a couple of times. By putting in a pause with a wait block, you eliminate the bouncing effect of the key. This is called debouncing. Try the program without the wait and see what it does.

If Then Else

If then else extends our decision making. If then else is mutually exclusive. This means that only one of the choices or conditions can be true. You can stack multiple if else statements together.

The flowchart shows:
- **loop** (Continuous loop forever block)
- **if up button pressed** → **else**
  - True → **Turn on LED"s**
  - else → **if down button pressed** → **Turn on different LED's**
- **Back to the beginning**

Requirements

- The program will run when you press the up arrow on the IR remote.

- The program will play a part of Oh, Susannah, then wait until the remote button is pressed again.

Tutorial Assignment

1. Start mBlock. Save the program as **Oh, Susannah**.

2. Complete and test the programs as pictured with the requirements listed.

```
when mBot(mcore) starts up
forever
    if    IR remote  up ▼  pressed?   then
        wait  .1  seconds
        play note  C5 ▼  for  .125  beats
        play note  D5 ▼  for  .125  beats
        play note  E5 ▼  for  .25  beats
        play note  G5 ▼  for  .25  beats
        play note  G5 ▼  for  .25  beats
        play note  A5 ▼  for  .25  beats
        play note  G5 ▼  for  .25  beats
        play note  E5 ▼  for  .25  beats
        play note  C5 ▼  for  .5  beats
        play note  D5 ▼  for  .125  beats
        play note  E5 ▼  for  .25  beats
        play note  E5 ▼  for  .25  beats
        play note  D5 ▼  for  .25  beats
        play note  D5 ▼  for  .25  beats
        play note  C5 ▼  for  1  beats
```

Debounce IR remote button press

Oh, Susannah

Assignment

Start with your tutorial project and add the following.

- Add an Initialize block with a short sequence of notes to the beginning of the program before the forever loop. This snippet of music will play automatically to indicate the program has been initialized and the mBot is ready to go.

- Add the Initialize block where the example program says **Add initialization sound here.**

- Add movements in between the notes. The mBot can move and play at the same time. Don't put the movements too close together, every 5 notes or more.

- Add another **if then else** control structures to your program as shown in the example. Use if else to finish the control block. See the example where it says Play 2nd song and Add 2nd song here.

- Add another part of a song of your choosing to where the screenshot says **Add second song here**. (It doesn't have to be a complete song, just a short piece of it) or make up a short little song. There is plenty of sheet music available on the web with notes and names of notes to help you figure out a different song. Please don't use a program that someone else created, create your own program.

- Here is a web site to get you started with a known song.
  https://noobnotes.net

Example of how to add another song.

```
when mBot(mcore) starts up
  ▼                            ✕
  Add initialization sound here

  forever
    if   🎮 IR remote  up ▼  pressed?   then
      wait .1 seconds
                                            ▼              ✕
      🎵 play note  C5 ▼  for .125 beats
                                            Oh, Susannah
      🎵 play note  D5 ▼  for .125 beats
      🎵 play note  E5 ▼  for .25 beats
      🎵 play note  G5 ▼  for .25 beats
      🎵 play note  G5 ▼  for .25 beats
      🎵 play note  A5 ▼  for .25 beats
      🎵 play note  G5 ▼  for .25 beats
      🎵 play note  E5 ▼  for .25 beats
      🎵 play note  C5 ▼  for .5 beats
      🎵 play note  D5 ▼  for .125 beats
      🎵 play note  E5 ▼  for .25 beats
      🎵 play note  E5 ▼  for .25 beats
      🎵 play note  D5 ▼  for .25 beats
      🎵 play note  D5 ▼  for .25 beats
                                            ▼              ✕
      🎵 play note  C5 ▼  for 1 beats
                                            Play 2nd song
    else
      if   🎮 IR remote  down ▼  pressed?   then
                                            ▼              ✕
                                            Add second song here
```

Assignment Submission

- **All students** → Attach finished programs to the assignment in Blackboard.

- **In class assignment submission** → Demonstrate in person.

- **Online submission** → A link to a YouTube video recording showing the assignment placed in the submission area in BlackBoard.