Educational Robots for Absolute Beginners
Robot Project 3

Information for the Workshop Participant:

\textit{Directions}:  
Complete the assignment below and then ask your reviewer to use the attached instructions to check your work. You may attempt the project as many times as you would like; remember the purpose is to expand on what you have learned.

\textit{Additional Notes}:  
Before attempting this project assignment, we recommend that you
\begin{itemize}
  \item Try out the programs shown in the videos for yourself. Make sure that you understand how to write them yourself, and that when you download them to your EV3 it behaves as expected.
  \item Try writing the programs shown in the videos again, from scratch, again and again, until you get to the point where you can do so without peeking at the video or at your previous program.
  \item Complete the previous assignments – Robot Project 1 and Robot Project 2.
\end{itemize}

While we strongly recommend that you complete the above tasks, they are all optional and do not need to be reviewed.
Assignments:

Part 1:
Create a new program called **Project 3**. Your program should cause your robot to do a dance that lasts between 30 and 60 seconds and that includes, at a minimum:

- At least 8 movement blocks
- At least one loop block

These are the minimum requirements. Feel free to get creative and add sounds or image blocks too. Consider dancing to background music (either generated by the robot or by your mp3 player).

Part 2:
Since we cannot provide a specific list of actions for your reviewer to evaluate in this project, you must write up a “dance overview” which describes the set of actions your robot will perform.

Here is a sample “dance overview” that meets the minimum requirements:

1. Move forward for 4 seconds
2. Repeat the following steps twice in a row
   - a. Spin in place clockwise for 3 seconds
   - b. Spin in place counterclockwise for 3 seconds
3. Move backwards for 5 seconds
4. Drive in a circle clockwise for 6 seconds
5. Stop for 1 second
6. Move forward 3 seconds
7. Drive in a circle counterclockwise and backwards for 6 seconds

Here is an example of a more fun and interesting “dance overview”:

1. Move forwards for 2 seconds while displaying a smiley face
2. Repeat the following sequence three times while the words “Go Go Go” move around the screen:
   - a. Spin in place clockwise for 3 seconds
   - b. Move backwards for 1.5 seconds
   - c. Move forwards for 1.5 seconds
   - d. Stop and remain in place for 1 second
   - e. Move backwards for 1 second
   - f. Move forwards for 1 second
   - g. Spin in place counter clockwise for 3 seconds
3. Move backwards for 2 seconds while displaying a smiley face
4. Stop, display a stop sign on the screen and play an applause sound
Tips, Notes, and Ideas:

- While you can probably complete this project in 5 minutes if you’ve been working along with the videos, we encourage you to be creative – it’s so much more fun if you do so! Sort through and test different movement blocks and instructions to try and create some really cool dance moves. Or challenge yourself to program your robot to do a well-known dance step.
- It is astonishing how much more fun (and impressive) a robot dance is when it is performed to music. Grab your MP3 player and find your favorite track from a recent school choir concert.
- Having the robot play its own background music is a lot of fun, but can also take a lot of time. To have the music play while you move you will have to experiment with unchecking the “wait for completion” box on the sound blocks. In the “Advanced move blocks” lesson that’s coming up soon, you’ll also learn an alternate (but still time consuming) technique - using move blocks with unlimited duration before you play a sound.
- Make a video of your dance and upload it to your favorite video web site (e.g. YouTube). Then share your video with others in our class by posting a link to it on the course forum:
  - Join the group if you have not already done so
  - Scroll down through the list of topics to “Other.” Inside of other, select “Show off your Work”.
  - Select the topic “Week 4 Dance Videos”.
  - Click on the “Post Reply” option and add a link to your own video: You may provide links to videos of your dance you have uploaded to YouTube using the Link option above the post field and providing the URL of your video when prompted.

We look forward to seeing your dance!
In this project, the participant must:

- Provide you with a written “dance overview” that describes a sequence of movements that they have programmed the robot to follow.
- The “dance overview”:
  - Must describe a sequence of movements whose total duration is between 30 and 60 seconds.
  - Must include at least 8 movement instructions. Please note that stopping the robot and waiting for some duration (after it has previously moved) is a valid movement instruction.
  - Must repeat one subset of those instructions at least once.
  - May repeat one or more subsets of instructions multiple times.
  - May include non-movement actions such as sound or images. These are optional, to be included only if the participant wishes to do so.
- Demonstrate their robot performing the sequence of moves specified in their dance overview. Note that non-movement actions are not a required part of this project and you do not need to evaluate them.

Here is a sample “dance overview” to give you an idea of what you should expect one to look like. Please note that the “dance overview” provided to you by the participant may include very different movements:

1. Move forward for 4 seconds
2. Repeat the following steps twice in a row
   a. Spin in place clockwise for 3 seconds
   b. Spin in place counterclockwise for 3 seconds
3. Move backwards for 5 seconds
4. Drive in a circle clockwise for 6 seconds
5. Stop for 1 second
6. Move forward 3 seconds
7. Drive in a circle counterclockwise and backwards for 6 seconds