Meet ORA

Lesson 1

Name:_____

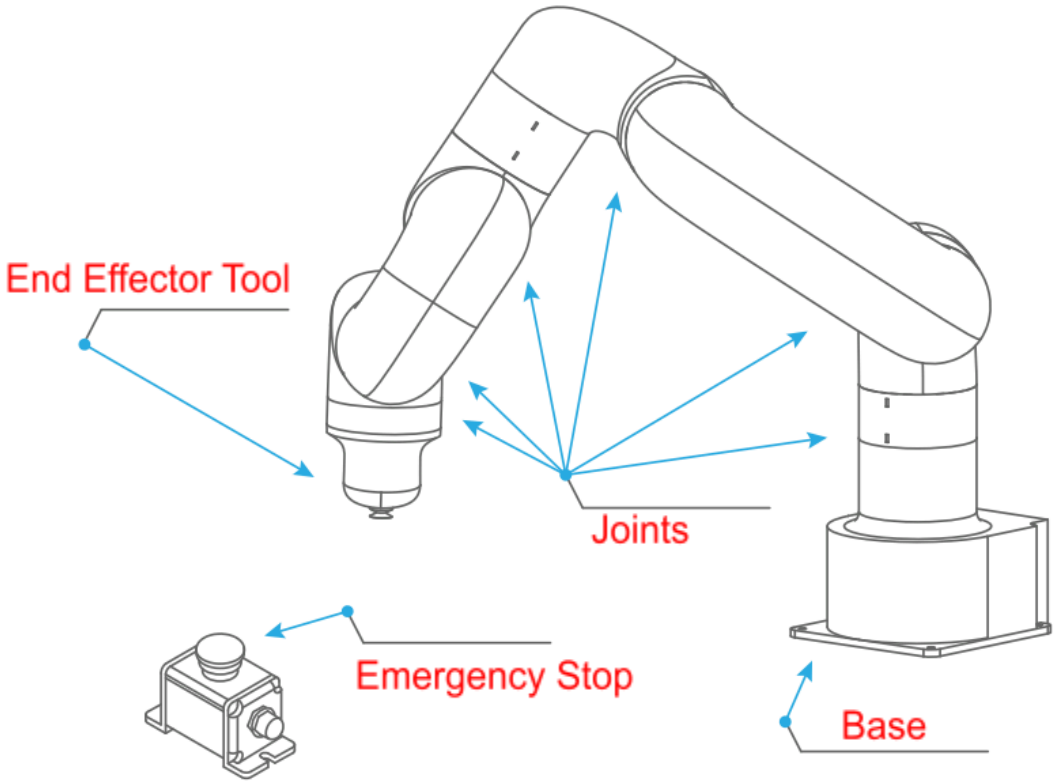
Date:_____

Vocabulary

Cobot - a robot intended for direct human-robot interaction within a shared space
Base - the bottom of the ORA attached to the table
Joints - parts of the ORA where the arm bends, turns, or otherwise moves
End Effector - the end piece of the ORA, two tools can go here, a vacuum gripper and a finger gripper
Safety Features - aspects of the ORA that increase safety. These include the **Emergency Stop** button and the **Collision Detection** function.
Safety Protocol - a list of safety procedures designed to maximize safety within a workspace.

Explore

Identify and **label** the indicated parts of the robot arm with the terms to the right



Base

Emergency Stop

End Effector Tool

Joints

What parts of your body are similar to these parts on the ORA?

Base = Core/Buttocks, Joints = knee, elbow, wrist, etc,
End Effector Tool = Hand

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Explain

ORA Safety Features: Describe each of the safety features below.

Emergency Stop

-What is the emergency stop button?

The emergency stop button is a safety feature that cuts power to ORA

-When do you use the emergency stop button?

When the ORA needs to be stopped immediately

Collision Detection

-What is collision detection?

The Collision Detector shuts down the ORA when it encounters an unexpected object in one of the quadrants

-When do you use collision detection?

All the time, it is on by default

Elaborate

Safety Protocol: What are the 5 most important safety rules for the ORA?

1. Give ORA Space
2. Do not rely on ORA's Smart Features
3. Unplug ORA When Setting Up Interactive Objects
4. Have Someone at or Within Easy Reach of the Emergency Stop at All Times
5. Abide by Normal Lab Rules

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Evaluate

Please answer the following prompts.
Do not forget to include your **name** and **date** on this paper!

1. Fill in the blanks

   The _Base__ on the ORA provides a stable attachment point to the table.

   The part of ORA that interacts with objects is called the End Effector Tool.

   The parts on the ORA that turn and rotate are called the _Joints_.

2. Thinking about the Safety Protocol, **cross out** the lab behaviors that **should not** occur around the ORA

   ~~Taking a drink of water~~

   Reaching into the Quadrant Mat with the power off

   Talking to your group mates

   ~~Tossing a pen to a group mate~~

   Pressing the emergency stop button

   ~~Leave while ORA does a task~~

   Asking the instructor for help

   ~~Trying to move the ORA while it is running code~~

3. Below are a few tasks. Explain why (or why not) a Cobot would be suited for each task.

   Stacking pallets in a warehouse

   This is a good use of a Cobot because pallets can be heavy and can also lead to repetitive stress injuries of humans

   Helping students out with their homework

   This is not a good use of a Cobot since they are designed for more automated tasks. It is a potential use for an AI or, better yet, a study group.

   Wrapping gifts at a gift shop

   This is a good use of a Cobot as it can perform some intricate and repetitive motions again and again precisely. YouTube YuMi Cobot!