

2023 – 2024 Over Under Virtual Skills

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Team: 1064P Almost HD

Location: Omaha Nebraska Omaha North (OPS)

Functions

The image displays six code blocks for robot functions, arranged in a 3x2 grid. Each block is a 'define' function with a specific name and a comment. The 'Intake' and 'Outtake' blocks use 'spin' and 'outtake' blocks respectively, with 'for' loops set to 360 and 420 degrees. The 'X_Positive', 'X_Negative', 'Y_Positive', and 'Y_Negative' blocks use 'while' loops to check GPS position (X or Y) against a target value, followed by a 'drive forward' block and a 'stop driving' block.

```
define Intake
  short rotation amount due to intake requiring less
  spin IntakeMotor intake for 360 degrees

define Outtake
  Outtake more effective longer duration (up to around 420)
  spin IntakeMotor outtake for 420 degrees

define X_Positive
  while GPS position X in inches < X_Position
    drive forward
  stop driving

define X_Negative
  while GPS position X in inches > X_Position
    drive forward
  stop driving

define Y_Positive
  while GPS position Y in inches < Y_Position
    drive forward
  stop driving

define Y_Negative
  while GPS position Y in inches > Y_Position
    drive forward
  stop driving
```

```
define Detect tribal
if Optical detects red ? then
  turn to heading 270 degrees
  Outtake
if Optical detects green ? then
  turn to heading 90 degrees
  spin ArmMotor up for 200 degrees
  drive forward for 24 inches
  Outtake
  spin ArmMotor down for 200 degrees
  drive reverse for 24 inches
```

```
define Detect Triball 2
if Optical detects red ? then
  turn to heading 90 degrees
  Outtake
if Optical detects green ? then
  turn to heading 270 degrees
  spin ArmMotor up for 200 degrees
  drive forward for 24 inches
  Outtake
  spin ArmMotor down for 200 degrees
  drive reverse for 24 inches
```

Variables



- Variables used in conjunction with GPS position



Sensors

× Optical detects red?	false
× Optical detects green?	false
× GPS position X in inches	-8.31
× GPS position Y in inches	1.02
× GPS heading in degrees	91
× Optical found an object?	false

Variables

× Count	0
× X_Position	0
× Y_Position	0

Main Code

```
when started
  Setting Max Velocity to Motors
  set Count to 0
  set X_Position to 0
  set Y_Position to 0
  set drive velocity to 100 %
  set turn velocity to 100 %
  set ArmMotor velocity to 100 %
  set IntakeMotor velocity to 100 %
  Starting Position Changes
  spin ArmMotor down for 1200 degrees and don't wait
  wait 1.5 seconds
  If statements to check starting position and move to optimal starting position
  if GPS position X in inches > -34 and GPS position Y in inches < 0 then
    turn to heading 270 degrees
    set X_Position to -34
    X_Negative
    turn to heading 0 degrees
    broadcast Bottom_Deposit
  if GPS position Y in inches < 0 then
    broadcast Bottom_Deposit

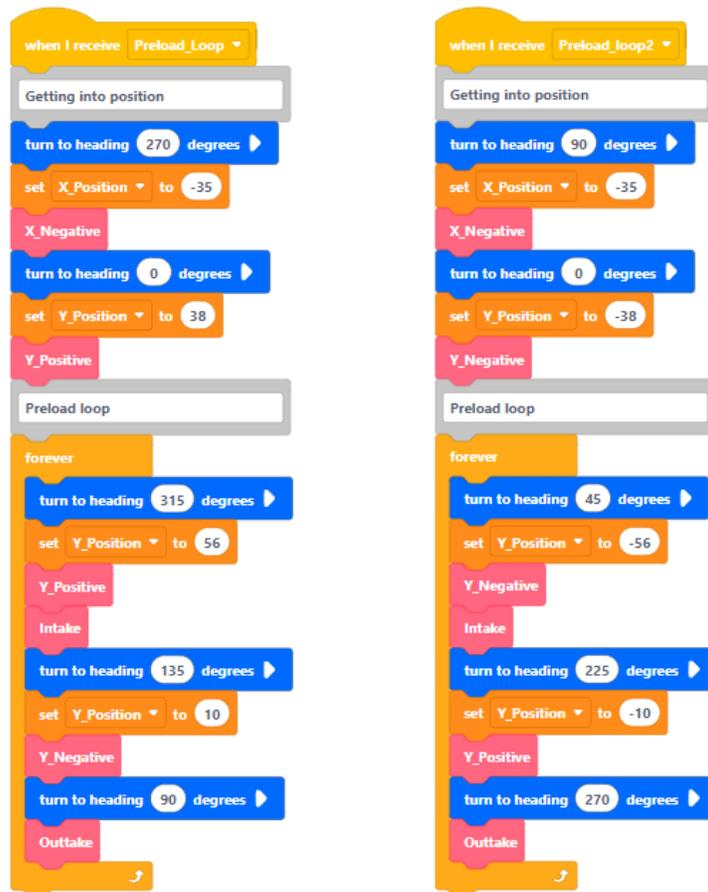
Code splits due to robot headings being flipped
if GPS position X in inches > -34 and GPS position Y in inches > 0 then
  turn to heading 90 degrees
  set X_Position to -34
  X_Negative
  turn to heading 0 degrees
  broadcast Top_Deposit
if GPS position Y in inches > 0 then
  broadcast Top_Deposit
```

```
when I receive Bottom_Deposit
  Deposit preload and get into position
  set Y_Position to 0
  Y_Positive
  turn to heading 270 degrees
  Outtake
  turn to heading 0 degrees
  Intake
  Detect tribal
  turn to heading 90 degrees
  drive forward for 3 inches
  Intake
  Detect tribal
  broadcast Detect_Bottom
```

```
when I receive Top_Deposit
  Deposit preload and get into position
  set Y_Position to 1
  Y_Negative
  turn to heading 90 degrees
  Outtake
  turn to heading 0 degrees
  Intake
  Detect Triball 2
  turn to heading 270 degrees
  drive forward for 3 inches
  Intake
  Detect Triball 2
  broadcast Detect_Top
```

```
when I receive Detect_Bottom
  Hardcoding is utilized
  set X_Position to -12
  X_Positive
  Intake
  Detect tribal
  start pre load loop
  broadcast Preload_Loop
```

```
when I receive Detect_Top
  Hardcoding is utilized
  set X_Position to -12
  X_Positive
  Intake
  Detect Triball 2
  start pre load loop
  broadcast Preload_loop2
```



- Code works for any starting position however not for any red tribal location (This was done due to during robotics competitions you are not guaranteed a starting position every time practicing coding with this in mind was the reason virtual skills was done this way)
- Turn heading used for better accuracy (Turn heading was flipped when changing starting position)
- Hard coding was used for many parts of the code due to the limited number of sensors.

YouTube Explanation: <https://youtu.be/xdbfz0DI1TI>

