



Student Name: Ishan, Finn, Colin & Kevin

Assignment: VEXcode VR Skills Challenge

Notes: Team 7737A. Redwood City, CA.

Playground: VIQC Virtual Skills - Full Volume

Project Name: The Storms - Virtual Skills Challenge (71 pts) (1)

Project Type: Blocks

Date: Wed Jan 31 2024



```

when started
  Start of the program,
  initialize robot

Initialize
  Goal 1
  Goal 2
  2 Red Blocks
  Goal 3
  Full Park

```

```

define initialize
  Sets up all of the starting values (velocity, variables, etc.)

  set IntakeMotorGroup velocity to 100 %
  set ArmMotorGroup velocity to 100 %
  set turn velocity to 100 %
  set drive velocity to 100 %

  This variable is for how far up the robot lifts its arm up.
  It is also used for lifting the arm half way up without
  hard coding the value

  set armHeightDegrees to 350
  set North to 0
  set East to 90
  set South to 180
  set West to 270

```

```

define arm down
  Puts arm down

  spin ArmMotorGroup down for armHeightDegrees degrees

```

```

define intake cube
  Intakes block

  spin IntakeMotorGroup intake

```

```

define arm up
  Lifts arm up

  spin ArmMotorGroup up for armHeightDegrees degrees

```

```

define dispense cube
  Dispenses block

  spin IntakeMotorGroup outtake

```

```

define Goal 1
  Finds, intakes block and lifts arm

  drive, find and intake block, use bumper false
  Turns to face the basket

  turn to heading West - 25 degrees

  Drives forward to dispense the first green block in Goal 2

  drive forward true distance(mm) 55 greater than false
  dispense cube
  wait 0.4 seconds
  Knocks down first red block

  drive forward false distance(mm) 585 greater than true
  turn to heading West degrees
  Re-aligning with the line of green blocks

  drive forward true distance(mm) 402 greater than false
  arm down

  turn to heading North degrees

  Picks up 2nd green block

  drive, find and intake block, use bumper true
  drive forward false distance(mm) 467 greater than true
  turn to heading West - 10 degrees
  drive forward for 50 mm
  Dispenses 2nd green block in Goal 2

  dispense cube
  wait 0.5 seconds
  turn to heading North degrees
  arm down

```

```

define Goal 2
  Gets a green block

  drive, find and intake block, use bumper true
  drive forward
  wait 2.3 seconds

  Turns toward goal and dispenses block

  turn to heading West degrees
  dispense cube
  wait 0.5 seconds
  turn right for 180 degrees

  Picks up 2nd green block

  intake cube
  arm down
  wait 0.2 seconds

  Turns and dispenses 2nd block

  arm up
  turn to heading West + 15 degrees
  dispense cube
  wait 0.5 seconds

```

```

define Goal 3
  Goes down towards the bottom right goal

  turn to heading South degrees
  drive forward true distance(mm) 75 greater than false
  turn to heading East degrees
  Dispenses green block that was picked up earlier

  drive forward true distance(mm) 75 greater than false
  dispense cube
  wait 0.5 seconds
  Drives backwards slightly so robot can move arm down

  drive forward false distance(mm) 150 greater than true
  arm down

  Faces flower, then goes to intake a green block

  turn to heading North degrees
  drive, find and intake block, use bumper true
  drive forward false distance(mm) 470 greater than true
  Turns back around so robot faces goal

  turn to heading East - 20 degrees
  drive forward for 20 mm
  Dispenses block and drives backwards

  dispense cube
  wait 1 seconds
  drive forward false distance(mm) 100 greater than true

```

```

define drive, find and intake block, use bumper useBumper
  Turns on intake and drives forward until a condition is met

  intake cube
  drive forward
  If useBumper is true the IntakeBumper sensor is used otherwise
  the FrontOptical sensor is used

  if useBumper then
    wait until IntakeBumper pressed?
  else
    wait until FrontOptical found an object?
  stop driving

  Arm is moved up so robot is ready to score and so
  the distance sensor can be used

  arm up

```

```

define drive forward forward distance(mm) distance greater than greater than
  Drives forward or reverse until distance condition is met

  if forward then
    drive forward
    "distance" is used to figure how close to
    an object ahead to stop

    wait until FrontDistance object distance in mm < distance
  else
    drive reverse
    "distance" is used to figure how far away from
    an object ahead to stop

    wait until FrontDistance object distance in mm > distance
  stop driving

```

"greater than" was used in a previous version of this function and is no longer being used. It has not been deleted because deleting it resets all the parameters in the code.

```

define 2 Red Blocks
  Faces toward red block

  turn to heading East + 45 degrees

  Moves arm half way down so red block is hit

  spin ArmMotorGroup down for armHeightDegrees / 2 degrees
  drive forward for 115 mm
  turn to heading East degrees

  Arm goes down to pick up green block

  spin ArmMotorGroup down for armHeightDegrees / 2 degrees
  drive, find and intake block, use bumper true
  turn to heading East degrees

  Drives towards supply zone to get ready for next step

  drive forward true distance(mm) 380 greater than false

```

```

define Full Park
  Turns and drives in-front of supply zone(preparing to full park)

  turn to heading East / 2 degrees
  drive forward true distance(mm) 100 greater than false

  Turns to face away from supply zone

  turn to heading South degrees

  Moves arm up, while diving backwards

  spin ArmMotorGroup up
  drive forward false distance(mm) 800 greater than true

  Waits until arm has reached a certain position, enough to robot into supply zone

  wait until ArmMotorGroup position in degrees > 1800

  Moves arm back. Because robot is top-heavy, base moves into the supply zone

  spin ArmMotorGroup down
  wait until ArmMotorGroup position in degrees < -190

  stop project

```

**when started**

**Start of the program,  
initialize robot**

**intitialize**

**Goal 1**

**Goal 2**

**2 Red Blocks**

**Goal 3**

**Full Park**

define

initialize

Sets up all of the starting values (velocity, variables, etc.)

set IntakeMotorGroup ▾ velocity to 100 % ▾

set ArmMotorGroup ▾ velocity to 100 % ▾

set turn velocity to 100 %

set drive velocity to 100 %

This variable is for how far up the robot lifts its arm up. It is also used for lifting the arm half way up without hard coding the value

set armHeightDegrees ▾ to 350

set North ▾ to 0

set East ▾ to 90

set South ▾ to 180

set West ▾ to 270

define

arm down

Puts arm down

spin

ArmMotorGroup ▾

down ▾

for

armHeightDegrees

degrees ▾

**define**

**intake cube**

**Intakes block**

**spin**

**IntakeMotorGroup** ▼

**intake** ▼

define

arm up

Lifts arm up

spin

ArmMotorGroup ▾

up ▾

for

armHeightDegrees

degrees ▾

**define**

**dispense cube**

**Dispenses block**

**spin**

**IntakeMotorGroup** ▼

**outtake** ▼



```
define Goal 1
  Finds, intakes block and lifts arm
  drive, find and intake block, use bumper false
  Turns to face the basket
  turn to heading West - 25 degrees
  Drives forward to dispense the first green block in Goal 2
  drive forward true distance(mm) 55 greater than false
  dispense cube
  wait 0.4 seconds
  Knocks down first red block
  drive forward false distance(mm) 565 greater than true
  turn to heading West degrees
  Re-aligning with the line of green blocks
  drive forward true distance(mm) 402 greater than false
  arm down
  turn to heading North degrees
  Picks up 2nd green block
  drive, find and intake block, use bumper true
  drive forward false distance(mm) 467 greater than true
  turn to heading West - 10 degrees
  drive forward for 50 mm
  Dispenses 2nd green block in Goal 2
  dispense cube
  wait 0.5 seconds
  turn to heading North degrees
  arm down
```

```
define Goal 2
  Gets a green block
  drive, find and intake block, use bumper true
  drive forward
  wait 2.3 seconds
  Turns toward goal and dispenses block
  turn to heading West degrees
  dispense cube
  wait 0.5 seconds
  turn right for 180 degrees
  Picks up 2nd green block
  intake cube
  arm down
  wait 0.2 seconds
  Turns and dispenses 2nd block
  arm up
  turn to heading West + 15 degrees
  dispense cube
  wait 0.5 seconds
```

define Goal 3

Goes down towards the bottom right goal

turn to heading South degrees

drive forward true distance(mm) 75 greater than false

turn to heading East degrees

Dispenses green block that was picked up earlier

drive forward true distance(mm) 75 greater than false

dispense cube

wait 0.5 seconds

Drives backwards slightly so robot can move arm down

drive forward false distance(mm) 150 greater than true

arm down

Faces flower, then goes to intake a green block

turn to heading North degrees

drive, find and intake block, use bumper true

drive forward false distance(mm) 470 greater than true

Turns back around so robot faces goal

turn to heading East + 20 degrees

drive forward for 20 mm

Dispenses block and drives backwards

dispense cube

wait 1 seconds

drive forward false distance(mm) 100 greater than true

define

drive, find and intake block, use bumper

useBumper

Turns on intake and drives forward until a condition is met

intake cube

drive forward ▾

If useBumper is true the IntakeBumper sensor is used otherwise the FrontOptical sensor is used

if useBumper then

wait until IntakeBumper ▾ pressed?

else

wait until FrontOptical ▾ found an object?

stop driving

Arm is moved up so robot is ready to score and so the distance sensor can be used

arm up

define

drive forward

forward

distance(mm)

distance

greater than

greater than

Drives forward or reverse until distance condition is met

if forward then

drive forward

"distance" is used to figure how close to an object ahead to stop

wait until

FrontDistance

object distance in

mm

<

distance

else

drive reverse

"distance" is used to figure how far away from an object ahead to stop

wait until

FrontDistance

object distance in

mm

>

distance

stop driving

define Full Park

Turns and drives in-front of supply zone(preparing to full park)

turn to heading East / 2 degrees

drive forward true distance(mm) 100 greater than false

Turns to face away from supply zone

turn to heading South degrees

Moves arm up, while diving backwards

spin ArmMotorGroup up

drive forward false distance(mm) 600 greater than true

Waits until arm has reached a certain position, enough to robot into supply zone

wait until ArmMotorGroup position in degrees > 1600

Moves arm back. Because robot is top-heavy, base moves into the supply zone

spin ArmMotorGroup down

wait until ArmMotorGroup position in degrees < -100

stop project

define 2 Red Blocks

Faces toward red block

turn to heading East + 45 degrees

Moves arm half way down so red block is hit

spin ArmMotorGroup down for armHeightDegrees / 2 degrees

drive forward for 115 mm

turn to heading East degrees

Arm goes down to pick up green block

spin ArmMotorGroup down for armHeightDegrees / 2 degrees

drive, find and intake block, use bumper true

turn to heading East degrees

Drives towards supply zone to get ready for next step

drive forward true distance(mm) 360 greater than false