

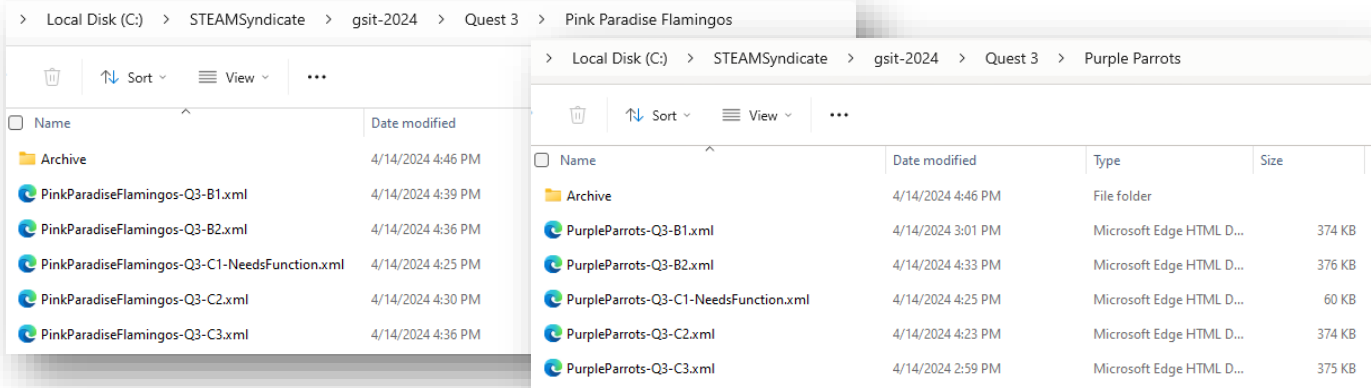


## Quest 3 – Checklist

- ☐ Watch video about Challenge 1
- ☐ Update code for Challenge 1
- ☐ Add lights/sounds to Challenge 3 [Optional but Recommended]
- ☐ Complete Bonus 2
- ☐ Complete Bonus 1
  
- ☐ Record Intro
- ☐ Record Quest 3 Challenge 1
- ☐ Record Quest 3 Challenge 2
- ☐ Record Quest 3 Challenge 3
- ☐ Record Quest 3 Bonus 1
- ☐ Record Quest 3 Bonus 2
- ☐ Record “Thank You”

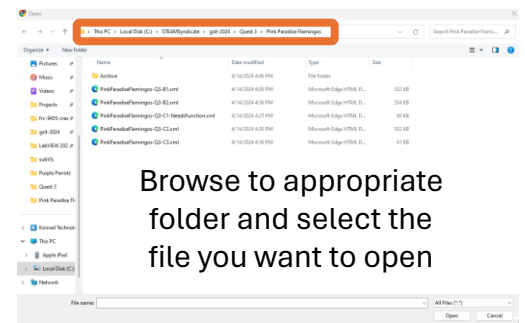
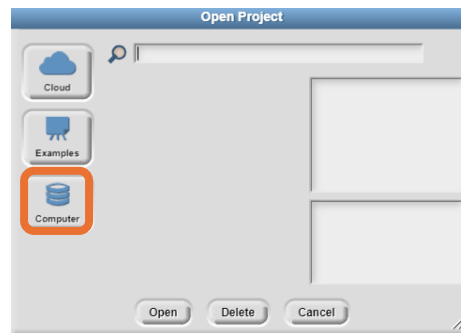
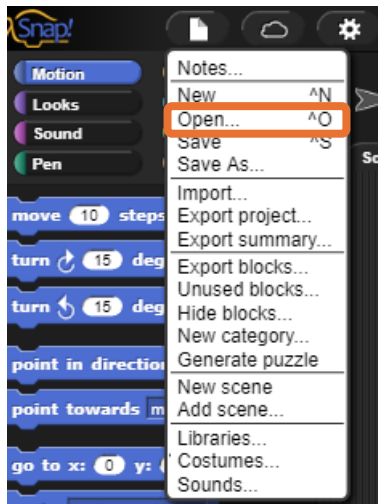
# Snap! File Management

All Girls Solve IT files are saved locally on disk and backed up to the STEAM Syndicate GitHub. You can find all of your team's quest 3 files in the following disk location:  
C:\STEAMSyndicate\gsit-2024\Quest 3\**<team name>**



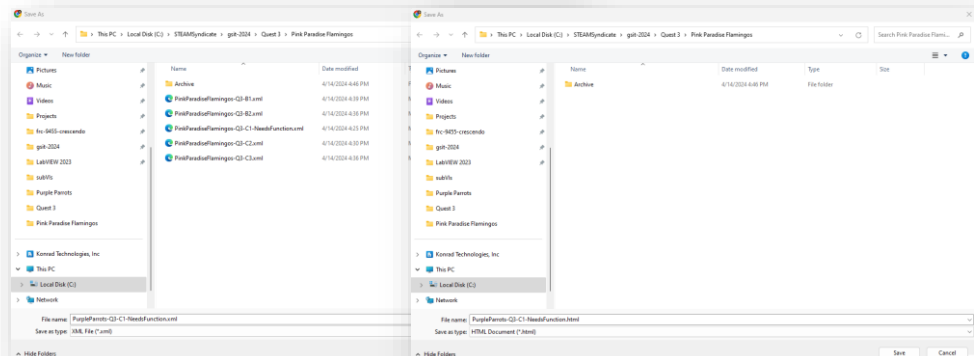
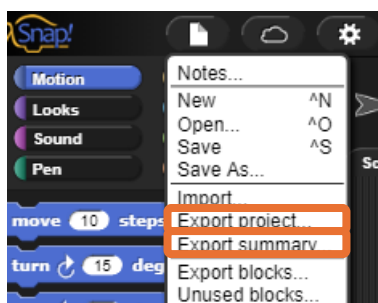
## Open Files

Navigate to <https://snap.berkeley.edu/snap/snap.html#> -or- launch from the Bluebird Connector software. Click on the file and select “Open” the select “Computer” in the next dialog and pick a file.



## Export Project / Summary

Click on the file icon and select “Export project...”. A windows prompt will appear allowing you to save the project to disk. You need to repeat this action except select “Export summary...” to generate a file that has images of your project. The files generated are different (\*.xml vs. \*.html).



# Quest 3 – Challenge 1

when clicked

Finch A Beak R 0 % G 0 % B 0 %  
 Finch A Tail all R 0 % G 0 % B 0 %  
 Finch A Reset Encoders

Initialize (turn off colors, reset sensors)

set miles to 214 VARIABLE – Given value, 214 miles to travel

set fullGasTank to  $\text{miles} / 2$  VARIABLE – Given value, 107 miles in full gas tank

set circumference to  $3.142 \times 5$  VARIABLE – Given wheel diameter calculate circumference

set cmMilesConversionFactor to 10 VARIABLE – Pick a conversion factor (how many miles = 1 cm)

set currentDistanceTraveled to 0 VARIABLE – Calculated; keeps track of distance traveled on current gas tank

set numGasTankFilled to 0 VARIABLE – Counter; keeps track of how many times we fill gas tank

set totalDistanceTraveled to 0 VARIABLE – Calculated; keeps track of total distance traveled

repeat until  $\text{totalDistanceTraveled} > \text{miles}$

set currentDistanceTraveled to  
 $\text{Finch A Right Encoder (rotations)} \times \text{circumference} \times \text{cmMilesConversionFactor}$

Our current distance traveled is our encoder count \* circumference \* conversion factor

if  $\text{currentDistanceTraveled} < \text{fullGasTank}$  Check status of gas tank

Finch A Move Forward 1 cm at 50 % Move Finch!

if  $\text{currentDistanceTraveled} > 0.8 \times \text{fullGasTank}$

Finch A Beak R 100 % G 0 % B 0 %  
 Finch A Tail all R 100 % G 0 % B 0 %

else if  $\text{currentDistanceTraveled} > 0.2 \times \text{fullGasTank}$

Finch A Beak R 75 % G 40 % B 0 %  
 Finch A Tail all R 75 % G 40 % B 0 %

else if ☒

Finch A Beak R 0 % G 100 % B 0 %  
 Finch A Tail all R 0 % G 100 % B 0 %

Set Finch lights based on gas tank – this is the part they really want you to put into the function!

else

change numGasTankFilled by 1 It is very important we increment our gas tank filling before next step

set totalDistanceTraveled to  
 $\text{numGasTankFilled} \times \text{currentDistanceTraveled}$

Our total distance traveled is the number of gas tanks filled \* current distance traveled

set currentDistanceTraveled to 0 Reset currentDistance variable and encoders so we can keep going

Finch A Reset Encoders

Ideally you add some sort of notification (Microbit Lights, sound, etc.) in the “else” case to indicate that Finch is filling up her gas tank!

## Quest 3 – Challenge 2

- Program Finch to follow the black line path set for the trolley tour using the line tracking sensors
- Traverse the entire path of the tour.
- Add sounds / lights/ or anything else to convey Finch's excitement while sightseeing



This is perfect! No changes necessary – write script and record!

## Quest 3 – Challenge 3

- Place ping pong ball on the paper cup
- Tape the plastic fork to the straw to make a jousting stick.
- Tape the jousting stick to your Finch robot.
- Place Finch about 60 cm (2 feet) back and 30 cm (1 feet) over from the paper cup
- Program Finch to move forward 60 cm (2 feet) and 30 cm (1 feet) to the right, towards the paper cup
- Program Finch to spin around when near the cup to knock the ping pong ball of the cup using the jousting stick



This meets the minimum requirements (provided you setup the ping pong ball and distances appropriately. For bonus points consider adding lights/sounds!

# Quest 3 – Bonus 1

- Paste the images of the obstacles onto the cups and place the cups along the path at the marked positions.
- Program Finch to follow the black line path set for the trolley tour using the line tracking sensors
- Program finch to use the distance sensors to look out for any obstacles along the path
- Program a function that gets called every time Finch is near an obstacle. This function should have Finch
  - Move around the obstacle
  - Come back to the designated black line path
- Finch should continue to traverse forward through the tour each time she returns to the path after overtaking the obstacle
- Traverse the entire tour without crashing into any obstacle

You should take out some or all of your sounds/timer. You need to use the sensor to detect an object and go around – look at Purple Parrots code (to the right)

```

when space key pressed
  reset timer
  repeat until timer = 53
    say Finch Left Line
    if Finch Left Line < 90
      Finch Wheels L 0 % R 20 %
    else
      Finch Wheels L 20 % R 0 %
    if timer > 5 and timer < 7
      Finch Stop
      play sound fun until done
    if timer > 16 and timer < 18
      Finch Stop
      play sound MLK until done
    if timer > 34 and timer < 36
      Finch Stop
      play sound art until done
    if timer > 44 and timer < 46
      Finch Stop
      play sound interesting until done
  Finch Stop
  
```

```

when space key pressed
  forever
    repeat until Finch Distance (cm) < 25
      say Finch Left Line
      if Finch Left Line < 90
        Finch Wheels L 0 % R 20 %
      else
        Finch Wheels L 20 % R 0 %
      Finch Stop
      Finch Turn Right 80 ° at 50 %
      Finch Move Forward 5 × 2.54 cm at 50 %
      Finch Turn Left 90 ° at 50 %
      Finch Move Forward 9 × 2.54 cm at 50 %
      Finch Turn Left 90 ° at 50 %
      Finch Move Forward 10 cm at 50 %
    
```

Purple Parrots code repeats until it sees an object then it goes around then goes back to line following if no more objects

## Quest 3 – Bonus 2

- Use Finch Encoders block to calculate the total distance travelled along the entire tour
- Program Finch to display the calculated total distance

when space key pressed

set circumference to  $3.142 \times 5$  Set circumference, reset encoders

Finch Reset Encoders

reset timer

repeat until timer = 53

if Finch Left Line < 90

Finch Wheels L 0 % R 20 %

else

Finch Wheels L 20 % R 0 %

if timer > 5 and timer < 7

Finch Stop

play sound fun until done

if timer > 16 and timer < 18

Finch Stop

play sound MLK until done

if timer > 34 and timer < 36

Finch Stop

play sound art until done

if timer > 44 and timer < 46

Finch Stop

play sound interesting until done

set distanceTraveled to

circumference  $\times$

Finch Right Encoder (rotations) + Finch Left Encoder (rotations)

/ 2

micro:bit Print distanceTraveled

Finch Stop

You should take out some or all of your sounds/timer. You need to use the sensor to detect an object and go around – look at Purple Parrots code (to the right)

Calculate total distance traveled  
(average encoders \* circumference)

Display to user



# Script Template



## Intro

EVERYONE: *"Hi! We are the Pink Paradise Flamingos and this is our solution to quest 3!"*

## Challenge 1

NARRATOR: *Finch is loving this road trip! Before getting back on the road, Finch checks her gas gauge and decides to setup a quick alert to let her know when she's running low on gas. Finch's road trip is 214 miles long, and the gas tank allows her to travel 107 miles.*

*<Add more details of challenge/fun comments while Finch is moving>*

*<Explain code>*

## Challenge 2

FINCH: *"Ah great, now my tank is all filled up for some sightseeing!"*

NARRATOR: *Finch had read up on a lot of fun stuff to see in Atlanta and was really looking forward to this pitstop! She decides to take a trolley tour around the city so that she can cover multiple locations in a short time. Her tour will cover:*

- *Centennial Olympic Park*
- *Martin Luther King Jr. National Historic Site*
- *The Woodruff Arts Center*
- *Georgia State Capitol*

*<Add more details of challenge/fun comments while Finch is moving>*

*<Explain code>*



### Challenge 3

FINCH *“Ah finally my tank is all filled up and it’s time to head off straight to Florida!! Next stop- the amusement park! “*

NARRATOR: *Finch hummed along with the crickets in the night sky, merrily continuing her journey. She halted to a stop as she noticed a humongous boulder blocking her path! It was too wide to go around it. Finch could of course fly over it, but she knew that humans coming this way would get stuck. Her second nature to help others prevented her from going her own way. She notices a big log a wood by the side of the road. She decides to use the log of wood as a jousting stick to knock the boulder.*

<Add more details of challenge/fun comments while Finch is moving>

<Explain code>

### Bonus 1

<Add more details of challenge/fun comments while Finch is moving>

<Explain code>

### Bonus 2

<Add more details of challenge/fun comments while Finch is moving>

<Explain code>

### Thank You

EVERYONE: *“Thank you”*