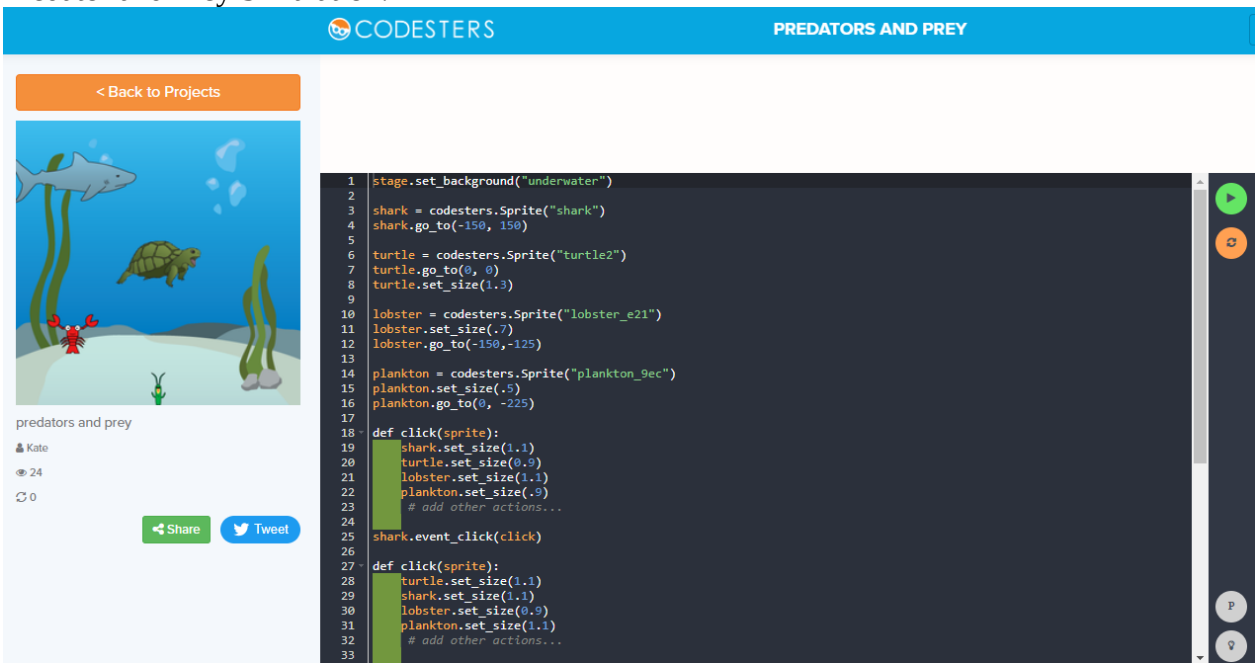
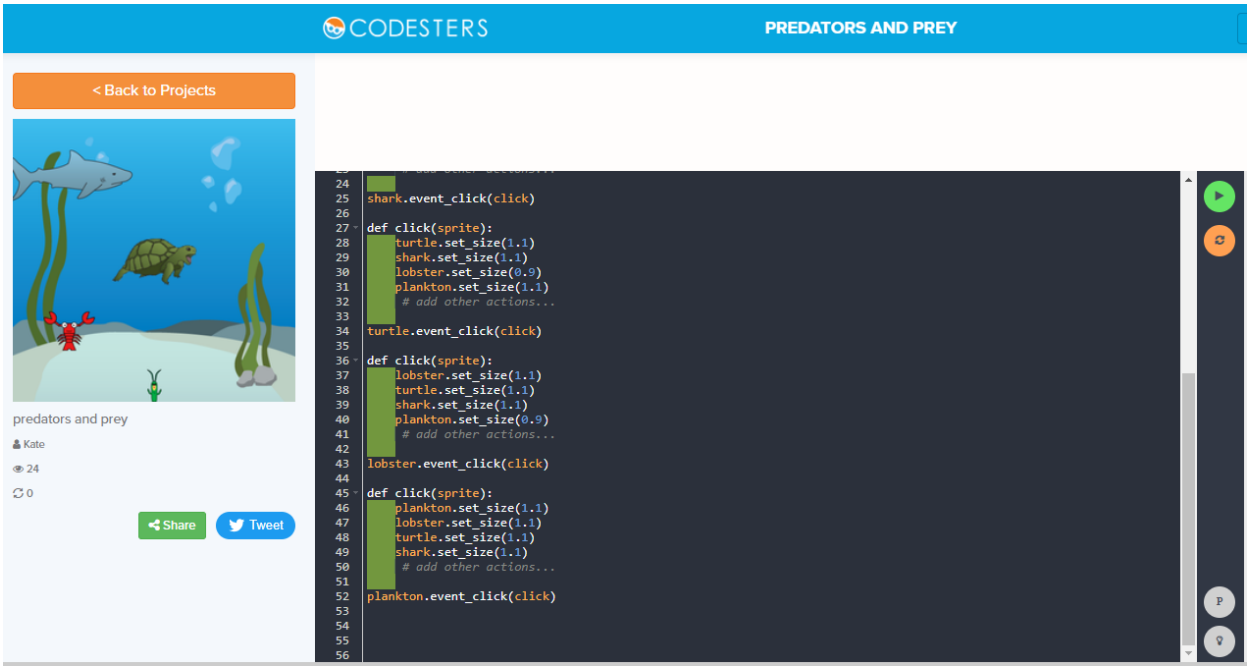
Code Handout

Description

Here, you will find screenshots of the code used in the simulations. Students can use this code to make the predator-prey simulation which is a graphic representation of what happens when the population of certain species is changed. There are also screenshots of the simulation that enables students to input numbers and see what happens to the populations of predators and prey over time.
https://www.codesters.com/preview/ef72685cc1054a30aab873f67ca804dc/
Both simulations are coded in Python using the Codesters platform found here:
https://www.codesters.com/project/

Predator and Prey Simulation:





Graphing Populations:

```
# Get USR Input:
goodX0 = 0
while goodX0 == 0:
    print("Enter Starting Prey Population:")
    x0 = int(input("(There must be at least one prey!)"))
    if x0 > 0:
        goodX0 = 1

goodY0 = 0
while goodY0 == 0:
    print("Enter Starting Predator Population:")
    y0 = int(input("(There must be at least one predator!)"))
    if y0 > 0:
        goodY0 = 1

goodB = 0
while goodB == 0:
    print("Enter Prey Birth Rate (enter whole number ie, 75% = '75'):")
    b = int(input("(Birth rate cannot be above 99% or below 1%!)"))
    if b > 0:
        if b < 100:
            goodB = 1

goodH = 0
while goodH == 0:
    print("How many prey must a predator eat to survive a year?")
    H = int(input("(Predators must eat at least one prey to survive!)"))
    if H > 0:
        goodH = 1


print("Starting Prey: " + str(x0))
print("Starting Predator: " + str(y0))
```

```
print("Starting Prey: " + str(x0))
print("Starting Predator: " + str(y0))


gen = 0
xT = x0
yT = y0
xTemp = 0
yTemp = 0

while gen < 15:
    print("Year: " + str(gen + 1))
    xTemp = xT + b*xT/100
    #print("TEST 1 " +str(xTemp))
    xTemp = xTemp - H*yT
    #print("TEST 2 " +str(xTemp))
    yTemp = yT / 4
    #print("TEST 1y " +str(yTemp))
    yTemp = yTemp + xT/H
    #print("TEST 2y " +str(yTemp))

    if xTemp <= 0:
        xTemp = 0

    if yTemp <= 0:
        yTemp = 0


    print("     Prey: " + str(xTemp))
    print(" Predator: " + str(yTemp))
    xT=xTemp
    yT=yTemp
    gen += 1
```

Example of data generated:

```
Enter Starting Prey Population:
(There must be at least one prey!)

  100000
Enter Starting Predator Population:
(There must be at least one predator!)

  50
Enter Prey Birth Rate (enter whole number ie, 75% = '75'):
(Birth rate cannot be above 99% or below 1%!)

  90
How many prey must a predator eat to survive a year?
(Predators must eat at least one prey to survive!)

  2
Starting Prey: 100000
Starting Predator: 50
Year: 1
     Prey: 189900.0
 Predator: 50012.5
Year: 2
     Prey: 260785.0
 Predator: 107453.125
Year: 3
     Prey: 280585.25
```