Police and Citizen Interactions

Team Members: Kay, Vashti, Judie

Team 56

Supercomputing Challenge

Mentors: Simon Redman & Ryan Palmer

April 11, 2021

Executive Summary (or Abstract?)

Your report should focus on your project rather than on the experiences of your team. The report must show that you conducted a scientific investigation, obtained results, and arrived at some conclusions. Be sure to include the following:

-an executive summary that is shorter than one page

- **Start with our 5 W's and 1 H**

Police's responses to how they handle situations with POC compared to non POC is a problem because the situation often escalates more due to the biases lots of officers tend to have. According to the date we collected, these biases tend to come from past experiences officers have had, and the events that led them to the opinionated mindset they may have now. In order to research and evaluate the interactions between citizens and officers, we investigated using a primary source. We found that a majority of the interactions escalated due to the officer's instincts rather than racial biases.

Problem

-Police and minorities have been in back and forth in criticisms and crimes this past year. There are good and bad in each batch, and we want to thoroughly research and create an accurate model about how authorities and citizens react to each other, and how certain circumstances can positively and negatively impact the situation. Ex; Minority/Majority, rich/poor neighborhood, stress/fear levels, etc. We also want to find out probable psychological processes, as well as potential biases precreated prior to or created based on the experience.

- **Our research from BoJ and other trustworthy sources**
- **Psychology of a person (stress, biases and how they applied)**
- **Our original hypothesis and base question**

Methods (or Methodology?)

Beginning the development of the team's customized model had seemed daunting to the team and our beginners skillset. Because of this, we began to repurpose the Wolf Sheep Predation Model found in the NetLogo application's Model Library for our own use. We decided to use this model, because it had many aspects that our team thought would be useful to have, such as two opposing groups of turtles, as well as an interaction code. Due to this mindset, early edits of our code included deleting any unnecessary code, such as eating, reproduction, and death commands. This also entailed the recreating of our models and interaction code. The wolves in the model became our police officers, and the sheep of the model became the civilians. The interaction code between the sheep and wolves originally caused the wolves to eat the sheep that they encountered on the same pixel as them. This command was repurposed to our police and civilians: any civilian on the same pixel as an officer is automatically "taken to jail". This is where another flaw of the source code came into play. When the code was run, the civilian population rapidly diminished due to the death command still connected to the code. Because of this, we began research to attempt to find a solution to this setback. In the end, we discovered a command in the NetLogo Manual which allowed an individual turtle 'to hide' and to become visible again. We quickly applied this to our commands, and fixed any flukes to the code. The new command made any citizens that encountered an officer go to jail; or be hidden for a number of runs. Next, we added race to a percentage of our citizens. Each turtle is hispanic, white, or

black. We also narrowed down our police to citizen ratio, after more studying, to become more accurate to the amount of police in the workforce. Now, we worked for a probability percentage, which would make it more accurate, since not every encounter leads to imprisonment. The race of a turtle and randomly assigned bias of the officer can make it more or less likely to get arrested.

Results

Your report should focus on your project rather than on the experiences of your team. The report must show that you conducted a scientific investigation, obtained results, and arrived at some conclusions. Be sure to include the following:

-the results of your study

Hint: Consider using tables and/or graphs

- **End version of the model & data that supported the completion.**
- **Failed attempts and knowledge gained.**

Our model is not fully complete at this moment, but over this time period we've had many failed attempts while many successes as well. We've gained lots of knowledge from using Netlogo as well as using informational sources to find the necessary data for our project. Speaking first hand with officers allowed us to have a wider perspective on our topic, and to have a better understanding as well.

Conclusions (or Discussion?)

Your report should focus on your project rather than on the experiences of your team. The report must show that you conducted a scientific investigation, obtained results, and arrived at some conclusions. Be sure to include the following:

-the conclusions you reached by analyzing your results

In conclusion, we've learned a lot such as how past experiences affect how you may look at situations and can cause potential biases. We also learned that whether or not these situations escalate is more based on past experiences that have caused these biases. We have a better understanding of police officers' perspectives and how they interact with civilians. At first we were more biased when we started our project based on the events that happened this past year. Again, over time our opinions have changed due to research and primary sources.

-your most significant achievement on the project

- **Evolution in understanding of the topic**
- **Fluxuations and differences/similarities in stats between us and BoJ.**
- **General stats gained by completion of the project.**

References

Equal Justice Initiative. (2020, December 2). Black children are sixt times more likely to be shot to death by police. https://eji.org/news/black-children-are-six-times-more-likely-to-be-shot-to-death-by-police/

Mitchell, T. (2020, May 30). *3. Police and the community*. Pew Research Center's Social & Demographic Trends Project. https://www.pewsocialtrends.org/2017/01/11/police-and-the-community/

Officer J. Elliott, personal communication, November 6, 2020.

U.S. Department of Justice. *Understanding bias: A resource guide*. https://www.justice.gov/crs/file/836431/download

U.S. Department of Justice. (2003, June). *Factors That Influence Public Opinion of the Police*. https://www.ncjrs.gov/pdffiles1/nij/197925.pdf

Wilensky, U. (1999). NetLogo. http://ccl.northwestern.edu/netlogo/. Center for Connected Learning and Computer-Based Modeling, Northwestern University, Evanston, IL.

Wilensky, U. (1997). NetLogo Wolf Sheep Predation model. http://ccl.northwestern.edu/netlogo/models/WolfSheepPredation. Center for Connected Learning and Computer-Based Modeling, Northwestern University, Evanston, IL.

Appendix A: NetLogo Code

https://github.com/sredman/team-56-2020.git

```
; Officers and
civilians are both
breeds of turtles
                    breed [ officers officer ]
                    breed [ civilians civilian ]
                    breed [ trees tree ]
                    turtles-own [ stress race probability]       ; both officers
                    and civilians have stress & race



                    globals [ RACE_HISPANIC RACE_CAUCASIAN RACE_BLACK
                    PERCENTAGE_HISPANIC PERCENTAGE_CAUCASIAN PERCENTAGE_BLACK]


                    to setup
                     clear-all


                       ask patches [ ;the road is surrounded by green grass of
                    varying shades
                       set pcolor green - random-float 0.5]


                      ask patches with [ abs pycor <= 1 ] [
                       ; the road itself is varying shades of grey
                       set pcolor grey - 2.5 + random-float 0.25
                     ]


                    set RACE_HISPANIC 2
                    set RACE_CAUCASIAN 3
```

```
set RACE_BLACK 1

set PERCENTAGE_HISPANIC 20

set PERCENTAGE_CAUCASIAN 70

set PERCENTAGE_BLACK 10



 create-civilians initial-number-civilians  ; create the
civilians, then initialize their variables
 [
   set shape  "person"
   set color 37 ; NOTE: Tan/Sheep
   set size 1.5  ; easier to see
   set label-color blue - 2
   set stress random (2 * civilian-stress) ;
sheep-gain-from-food
   setxy random-xcor random-ycor
 ]



 create-officers initial-number-officers  ; create the
officers, then initialize their variables
 [
   set shape "car"
   set color 105 ; NOTE: Blue/Wolf
   set size 2  ; easier to see
   set stress random (2 * officer-stress) ;
wolf-gain-from-food
   setxy random-xcor random-ycor
 ]
 create-trees 10 ; create the trees, then initialize their
variables
```

```
 [
   set shape "tree"
   set color 31 ;
   set size 4 ;
   setxy random-xcor random-ycor
 ]
 ask turtles [
   let random-race-value random (100)
   if random-race-value > 0 and random-race-value <
PERCENTAGE_HISPANIC [
   set race RACE_HISPANIC
   ]


   if random-race-value > PERCENTAGE_HISPANIC and
random-race-value < PERCENTAGE_HISPANIC +
PERCENTAGE_CAUCASIAN [
   set race RACE_CAUCASIAN
   ]
   if random-race-value > PERCENTAGE_HISPANIC +
PERCENTAGE_CAUCASIAN and random-race-value <
PERCENTAGE_HISPANIC + PERCENTAGE_CAUCASIAN + PERCENTAGE_BLACK
[
   set race RACE_BLACK
   ]









   if race = RACE_CAUCASIAN [
   set color 125
```

```
    ]
    if race = RACE_HISPANIC [
      set color 25
    ]
    if race = RACE_BLACK [
      set color 32
    ]




 ]
 display-labels
 reset-ticks
end



to go
 ; stop the model if there are no officers and no civilians
 if not any? turtles [ stop ]



 ask civilians [
   move
   encounter-civilians
  ]
ask officers [
  move
```

```
  encounter-officers
     ]


 tick
 display-labels
end


to encounter ; function used when people crash into each
other
 let other-person one-of turtles-here                    ;
grab a random other person


 ; If a stressed-out person encounters a non-stressed out
person, the non-stressed-out person will become more stressed
 if other-person != nobody  [                              ;
did we get one? if so,
   if ([stress] of other-person) > 10 [
      set stress stress + 1 ; This person becomes more
stressed out
   ]
 ]



; If a calm person encounters a stressed person, the stressed
will become more calm
end


to move  ; turtle procedure
 rt random 50
 lt random 50
 fd 1
end
```

```
to display-labels
 ask turtles [ set label "" ]
end


to encounter-civilians
 encounter
 let other-person one-of officers-here
 if other-person != nobody [
   ask other-person [die]
 ]
end


to encounter-officers
 encounter
 let other-person one-of civilians-here
if other-person != nobody [
 ask other-person [die]
 ]
end
to hide
ask patches [
 if hidden? = false [
   set hidden? [true]
 ]
]
ask patches [
 if hidden? = true [
   set hidden? [false]
 ]
```

```
]

end
```

Appendix B: Acknowledgements

an acknowledgment of the people and organizations that helped you

Example: We would like to thank _____. We are especially grateful for _____.

We would like to thank every single one of the adults that contributed their time to us. The adults that played a very big part in helping us with our project were Caia Brown, Simon Redman, Ryan Palmer, and Rebecca Campbell. We are especially extra grateful for Ms.Brown. She is the one who originally introduced us to Supercomputing Challenge in the first place. She constantly went out of her way to help us find better strategies to work together, find information, and be great teammates overall. Our mentor Mr.Redman was extremely helpful along the way, he guided us through the tough world of coding, and was there to provide any help we ever needed. Last of all special thanks to Ms.Palmer she was always there to contribute great ideas and just an amazingly positive attitude overall.