Pizza Drawing Lab 5
Lab 1

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"On my honor, as a Mississippi State University student, I have neither given nor received unauthorized assistance on this academic work."

CSE 1284 Introduction to Computer Programming
Lecture Section Time: TIME GOES HERE (MWF 10am)
Instructor: Monika Jankun-Kelly
Lab Section: Friday
Lab Assistant: Tyler Narmore

Problem Statement

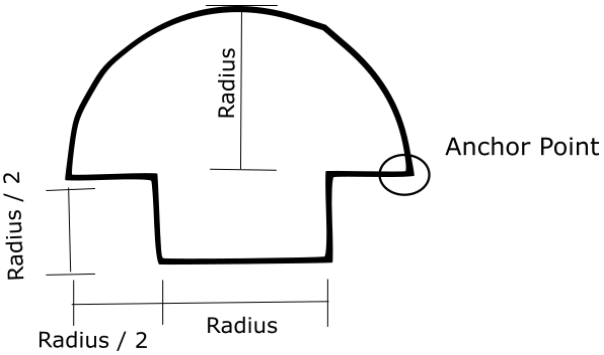
Draw a pizza with pepperonis and mushrooms.

Program Design

- Draw the crust circle (brown, radius 300)
- Draw the cheese circle (yellow, radius 260)

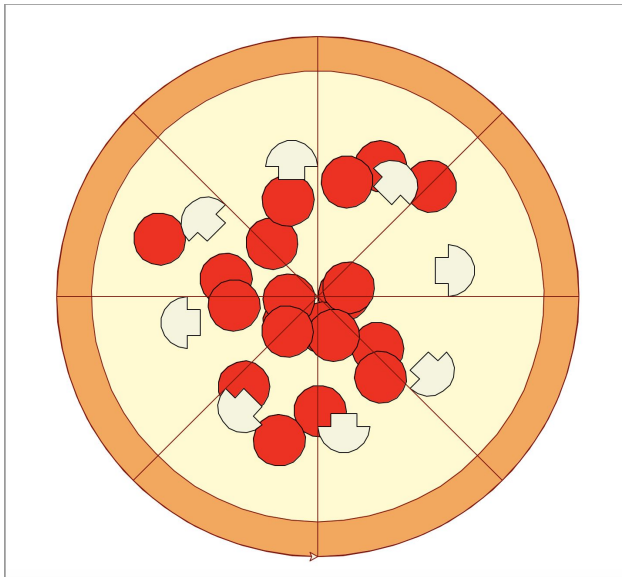
- Do the following loop 20 times to draw our pepperonis
    - Lift pen
    - Set position to (0,0)
    - Pick a random orientation
    - Pick a random distance between zero and cheeseradius - pepperoniRadius*2
    - Go forward the decided amount
    - Set pen down
    - Draw a red pepperoni circle'

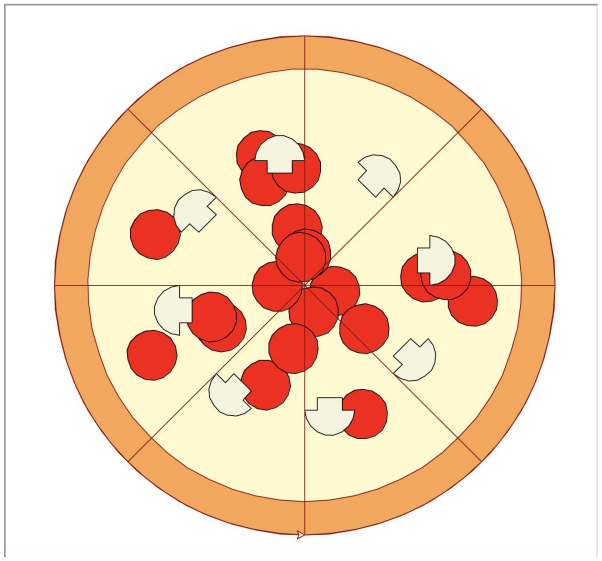
- Do the following loop 8 times to draw our mushrooms
    - Lift pen
    - Set position to (0,0)
    - Set orientation to 360 / 12
    - Move forward 150 pixels
    - Set pen down
    - Draw a rectangle
    - Draw a half circle on top of the rectangle

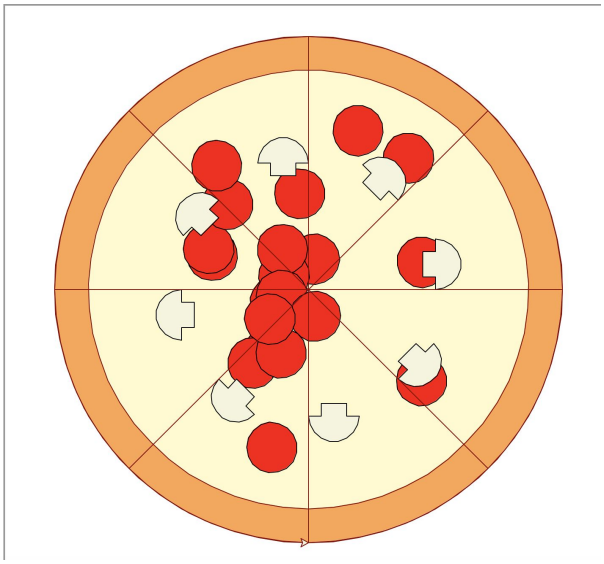


- Go to the bottom of the outer crust
- Do the following 8 times
    - Save the current position in a variable
    - Draw an arc that is ⅛ of the total pizza size
    - Go back to the position saved in the variable

Execution Screenshots







Analysis and Conclusions:

1. What was most challenging about this lab and how did you overcome the challenge? Be specific but brief.

Drawing the mushrooms was the most challenging part for us. We overcame this by taking a break and stopping to think about what the best approach would be.

2. What was most helpful to you when learning the concepts and skills needed for this lab? Specific, brief.

Experimentation and prior knowledge.

3. Were you happy with how your first attempts at random pepperoni turned out? Did the pepperoni appear evenly and realistically distributed? Did you end up changing your pepperoni placement method's design or code?

Our first attempt only allowed the pepperonis to be placed inside of a square that was conscribed within the circle.

We changed the program to randomly spin the turtle on the origin, then to move forward a random amount.

Code Appendix

Copy and paste your code into your lab report at the end. This speeds up grading.
The Code Appendix should start on a new page.

```
# Imports everything necessary for the program
from turtle import *
from random import randint
from math import *
from time import sleep

# Speed things a bit
speed(0)

# Setup the screensize and create a variable that is our originself.
screensize(600, 600)

# Draw the crust
pencolor("darkred") # simulate pizza sauce

# This is used in several places throughout the code, it sets the radius of the crust
outerCrustRadius = 300

# The circle function starts drawing at the very bottom of the circle
# We move move the pen to the negative radius so the center of the circle will be at (0,0)
penup()
goto(0, (-outerCrustRadius))
pendown()

# Draw the pizza crust circle
begin_fill()
fillcolor("tan1")
circle(outerCrustRadius)
end_fill()

# Draw the cheese circle inside of the crust circle
innerCrustRadius = outerCrustRadius - 40
penup()
goto(0, (-innerCrustRadius))
pendown()
begin_fill()
fillcolor("lemonchiffon")
circle(innerCrustRadius)
end_fill()

# Outline the pepperonis in dark red
pencolor("darkred")

# Draw range(x) amount of pepperonis
for pepperoni in range(20): # draw some pepperonis

    # Each pepperoni has a radius of 30
    pepperoniRadius = 30

    # Go the center of the pizza
    penup()
    goto(0,0)
```

```
    # Set a random orientation and move a random distance forward
    randomDistance = randint(0, (innerCrustRadius - pepperoniRadius*2))
    randomHeading = randint(0, 360)
    setheading(randomHeading)
    forward(randomDistance)

    # Draw the pepperoni circle
    pendown()
    begin_fill()
    fillcolor("red")
    circle(pepperoniRadius)
    end_fill()


# Draw mushroomTotal mushrooms
mushroomTotal = 8
for mushroom in range(mushroomTotal):

    # Set the cap radius to 30, this will be used for drawing the mushroom
    capRadius = 30

    # Set the amount the mushrooms should be rotated each time
    angleChange = 360/mushroomTotal
    angleChange = angleChange * mushroom

    # Go to (0, 0)
    penup()
    goto(0,0)

    setheading(angleChange)
    forward(150)

    # Draw the mushroom
    pendown()
    begin_fill()
    fillcolor("beige")
    circle(capRadius, 180)
    left(90)
    forward(capRadius/2)
    right(90)
    forward(capRadius/2)
    left(90)
    forward(capRadius)
    left(90)
    forward(capRadius/2)
    right(90)
    forward(capRadius/2)

    end_fill()


# Slice the pizza into segments
pencolor("darkred")
penup()
goto(0, (-outerCrustRadius))
pendown()
setheading(0)
```

```
# Move in short increments of a circle and intermidently draw lines
for slice in range(8):
        circle(outerCrustRadius, 45)
        turtlePos = pos()
        setpos(0, 0)
        setpos(turtlePos)
```