(30 pts) Approx. 3 days

The first part of this unit is all about learning how to program. Programming requires planning out and writing a series of very precise instructions that the program will follow. You'll start by watching a few videos about Jeroo and how to make programs work. Once you've taken some good notes about how to program in Jeroo, you'll complete the very first Jeroo challenge. From there you get to choose from a series of Jeroo challenges to complete. As you work, it's a good idea to keep taking notes and even printing/saving your successful programs!

1. Start by watching *Getting Started in Jeroo*, as well as *Sample Jeroo Programs 1 & 2*. Be sure to take a full page of good notes on how to program in Jeroo.
2. Complete the first Jeroo Challenge listed on the Jeroo Challenge Sheet (next page)
3. Have Mr. Benshoof confirm your completed first challenge!
4. Read through the rest of the Basic Jeroo Challenge options. Choose and complete 5 of these Basic Jeroo Challenges.
5. Have Mr. Benshoof confirm each of your successful Basic Jeroo Challenge programs.
6. Read through the Jeroo Super Challenges. Choose and complete 1 of the Jeroo Super Challenges.
7. Have Mr. Benshoof confirm your successful super challenge.
8. **Achievement:** If you want to earn an achievement here, complete a second Jeroo Super Challenge and have Mr. Benshoof confirm your successful program!

Part 1: Tasks	*5 points*	*4-3 points*	*2-1-0 points*
Jeroo Programming Notes	+ Watch *Getting Started in Jeroo* + Watch the sample Jeroo programs + Take 1 page of good notes in your engineering notebook	- Less than a full page of Jeroo notes	- Very brief or no notes in your engineering notebook
Complete Jeroo Challenge 1	+ Complete the first Jeroo Challenge + Have Mr. Benshoof confirm that your program works	- Your program does not fully accomplish the task	- You do not complete the first challenge - Mr. Benshoof does not see the program work
Complete 5 More Basic Jeroo Challenges	+ You choose and complete 5 more tasks from the Basic Jeroo Challenges list + Have Mr. Benshoof confirm that your programs work	- You only complete 4 or 3 of the Basic Jeroo Challenges	- You complete fewer than 3 Basic Jeroo Challenges
Complete 1 Jeroo Super Challenge	+ You choose and complete 1 Jeroo Super Challenge	- You sort of solve the super challenge, but not completely	- You do not try to solve a super challenge
	10 points	*9-4*	*3-0 points*
Complete the Jeroo Assignment	+ You completed the Jeroo Assignment	- You completed some of the assignment	- You did not complete the Jeroo assignment
Achievement	+ Complete an additional Jeroo Super Challenge		

(20 pts) Approx. 3 days

First Jeroo Challenge:

First Jeroo Challenge: Develop a program that creates a new Jeroo named after you! The Jeroo should start at location (2,3), and should start holding 50 flowers. The Jeroo should then hop around on the island planting flowers that create your first initial. In the example below, Jeroo "Jeremy" has hopped around and planted flowers in a "J":

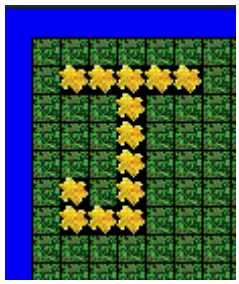

Figure 1 – The Island After Jeremy Plants The Letter "J"

Basic Jeroo Challenges (Choose 5 of the 6)

NOW DOWNLOAD THE MAPS FOLDER FROM MRBENSHOOF.COM AND PUT THE FOLDER ON THE DESKTOP. YOU CAN OPEN PRE-MADE MAPS BY CLICKING ON THE "OPEN" ICON ON THE RIGHT SIDE OF THE PROGRAM WINDOW!

Basic Challenge 1: Develop a program that has two methods in the "Jeroo Methods" tab. One method should tell your Jeroo how to hop and plant your first initial (like in Challenge 1), and the second method should tell your Jeroo how to hop and plant your second initial. Then use the "main method" to create a Jeroo and have it hop out both of your initials. In the example below, a Jeroo has hopped out it's initials "ME":

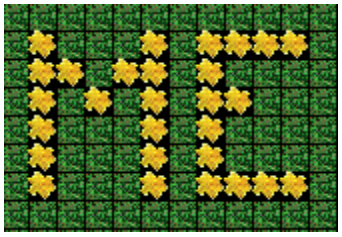

Figure 2 – The Island After Planting The Initials "ME"

Basic Challenge 2: (USE THE PRE-MADE MAP) Develop a program that uses the included island file (in the map folder) to create a new Jeroo at the location (0,0). The Jeroo should pick the flower then use it to disable the net so it can get home. (Home is the square of nets).

Basic Challenge 3: (USE THE PRE-MADE MAP) Develop a program that makes 4 Jeroos on the included relay island. One Jeroo should start in the top left of the island, one in the bottom left, one in the bottom right, and one in the top right. The Jeroos are running a relay; the first Jeroo picks up the flower. It should then run clockwise and disable the net so it can meet the Jeroo in the top-right corner. That Jeroo should then pick the nearby flower, and use it to get to the bottom-right corner. That Jeroo then uses the flower to reach the bottom-left corner. That Jeroo then picks the flower and runs up to end at spot (0,0).

SUPER **HELPFUL HINTS:**

- If you type "if(*name*.hasFlower())" then whatever you put in the brackets after that will only happen if the Jeroo named "*name*" has a flower.
- Other logical questions you can ask are
    - isWater(DIRECTION)
    - isNet(DIRECTION)
    - isClear(DIRECTION)
- In all these cases, DIRECTION can be AHEAD, LEFT, or RIGHT
- You can ask multiple questions in an if statement by going
  if(*name*.isClear(AHEAD) && *name*.isWater(RIGHT))
- You can have many if statements, or many questions in a single if statement

Basic Challenge 4: (USE THE PRE-MADE MAPS) The Jeroos are running hurdles. Develop a program that creates a Jeroo along the very bottom of the island (for example 23,0). They should run left to right and each time they encounter a vertical row of nets they should run up and over them. For example, a Jeroo on the island below would follow the arrow to get around the nets. **This program should work for *any* configuration of net "hurdles".** *(test islands available for in the map folder)*

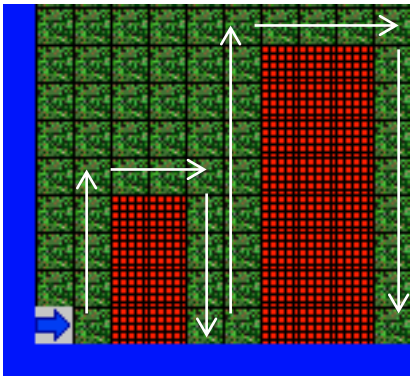

Figure 3 – The path over the hurdles. **This program needs to work for any configuration of "hurdles".**

(test islands available for in the map folder)

Basic Challenge 5: (NO PRE-MADE MAP) One Saturday morning, two friends, Bugs and Daffy, decide to meet and plant flowers to beautify Santong island. Daffy starts in the Northwest corner facing East with 90 flowers in his pouch. Bugs starts in the Northeast corner facing West with 90 flowers in his pouch. Bugs and Daffy begin hopping toward one another. As they hop, each plants exactly one flower at every location it enters, including its starting location. They meet, facing each other, roughly in the middle of row 0. After a handshake and a little small talk, Bugs and Daffy both turn toward the south and continue planting flowers all the way to the southern edge of the island. When both reach the South Sea, the say goodbye and part. Daffy turns west and plants flowers all the way to the Western Ocean. Bugs turns east and plants flowers all the way to the Eastern Ocean. This is where our story ends. Your task is to write a Jeroo program that will illustrate this story.

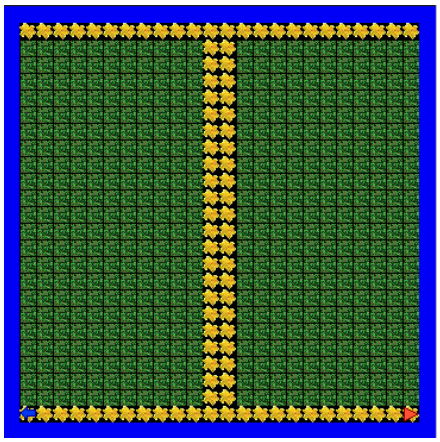

Figure 4 – The resulting pattern of flowers when the program is complete

Basic Challenge 6: (USE THE PRE-MADE MAPS) The Jeroos are practicing planting flowers in special patterns. Develop a program that makes a Jeroo that walks along the top edge of the island shown. As your Jeroo hops along it should plant a flower right above any flower it hops next to.

Figure 5 – The starting orientation of one of the test islands
(test islands available in the map folder)

Figure 6 – The final orientation of the test islands when the program is complete
(test islands available in the map folder)

Jeroo Super Challenges

Super Challenge 1 ("Tom & Tammy") : Tom and Tammy are in love, and today's the day that Tom is going to propose. According to custom, Tom must present Tammy with a flower as an official sign of his intentions. Tom lives in the extreme northwest corner of the island, and Tammy lives in the extreme northeast corner. The dividing river runs north and south, dividing the island roughly in the middle; the river is at least 5 cells away from the western and eastern edges of the island. The river, itself, is exactly two cells wide. Fortunately, for the lovers, there is a bridge somewhere to the south of their homes. Tom has asked Tammy to meet him at the middle of the bridge. While she suspects his motives, she doesn't want to appear too anxious.

The purpose of this program is to have Tom and Tammy find the bridge and meet in the middle where Tom will give an engagement flower to Tammy. After he has given her the flower, each returns to its home and faces the home of its betrothed. Each Jeroo starts at its home, Tom at (0,0) and Tammy at (0,23). Each can start facing any direction. Tom starts with one special flower in his pouch.

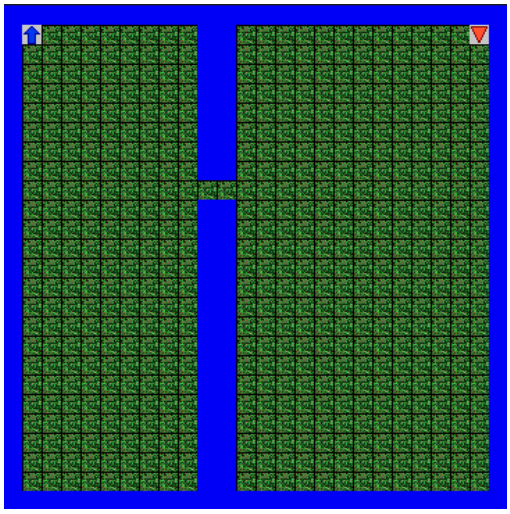

Figure 2 – One possible island; the program needs to handle vertical streams at any location.

(test islands available in the map folder)

Super Challenge 2 ("Netsweeper"): Develop a program that creates a Jeroo at (23,23) and has the Jeroo run around and pick up all the flowers on the island, then use them to disable all the nets on the island.

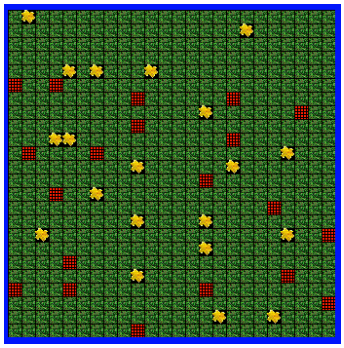

Figure 2 – One possible island; the program needs to work for any configuration of flowers & nets.

(test islands available in the map folder)

Super Challenge 3 ("Photocopier"): Develop a program that creates a Jeroo with a pouch full of flowers (like 50 or so). The Jeroo should then hop around to create a copy of the pattern of flowers that already exist on the island.

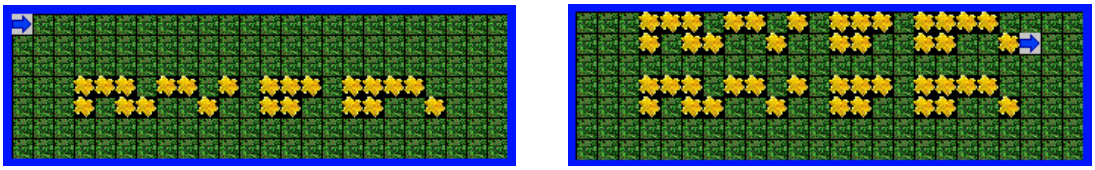

Figure 3 – The starting and finishing orientation of one of the test islands
(test islands available in the map folder)

Super Challenge 4 ("Maze Solver"): Your Jeroo is now like Theseus (from Minotaur battling fame). Theseus had to successfully enter a labrynth (maze), complete a task, and then get himself back out safely. Create a Jeroo that can navigate a maze made of nets. The Jeroo should start at (0,0), enter the maze, pick a flower somewhere in the maze, then get back out.

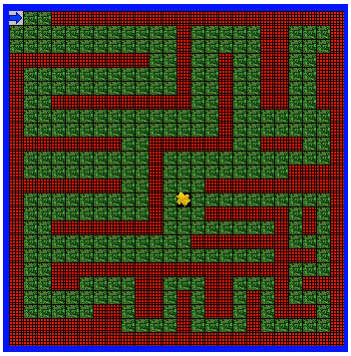

Figure 1 – One sample maze. Your program needs to work for any maez.

(test islands available in the map folder)