Sample Problems

Example 1.

Create a flowchart that display “Hello World!”. (In Arduino)

Pseudocode:

- Open Arduino IDE
- Create Arduino file then save as “testing.ino”
- Code Serial.begin with baud rate 9600
- Print “Hello World!”

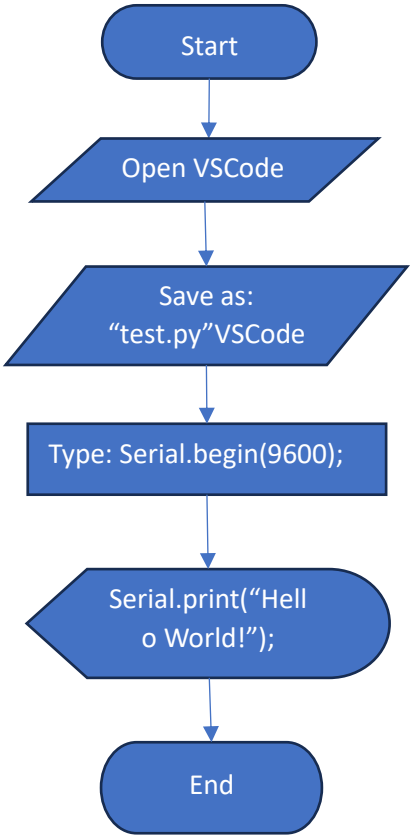
Algorithm:

Step 1: Open Arduino IDE

Step 2: Save as: testing.ino

Step 3: Type: Serial.begin(9600);

Step 4: Serial.print(“Hello World!”);



Example 2:

Create a flowchart that display the sum of 6 and 4. (In MATLAB)

Pseudocode:

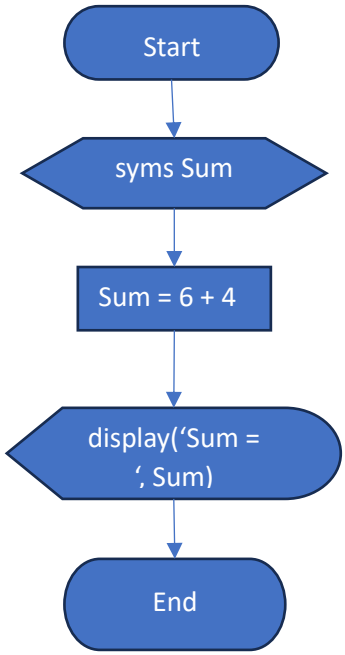
- Declare Sum variable
- Compute Sum of 6 and 4;
- Print Sum

Algorithm:

Step 1: syms Sum

Step 2: Sum = 6 + 4

Step 3: display(‘Sum = ‘, Sum)



Example 3:

Create a flowchart that ask the user's age. Compute and display his/her age 8 years from now. (In Python)

Pseudocode:

- Let x is the age of the user, y is 8 years from now and z is the sum of x and y
- Enter the user's age
- Solution is z = x + y
- Print the answer

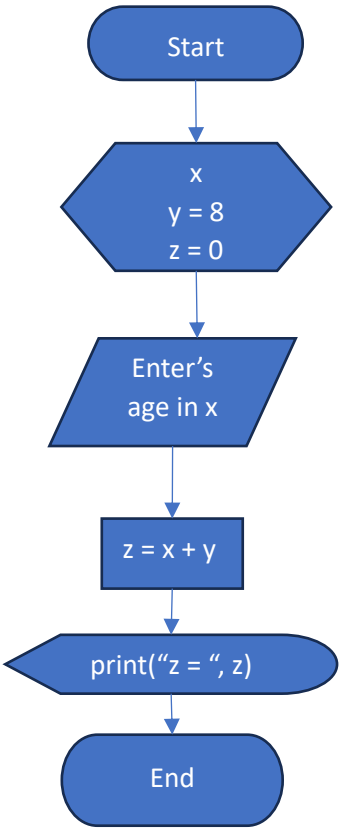
Algorithm:

Step 1: x, y = 8, z = 0

Step 2: Enter's age in x

Step 3: z = x + y

Step 4: print("z = ", z)



Example 4

Draw a flowchart that will ask the user to enter a character indicating the user's class section. If the user enters 'Afternoon Class' display "Your section is MEXE-3302".

Pseudocode:

- Declare variable x
- Enter the character in variable x
- If user enters 'Afternoon Class' print "Your section is MEXE-3302"

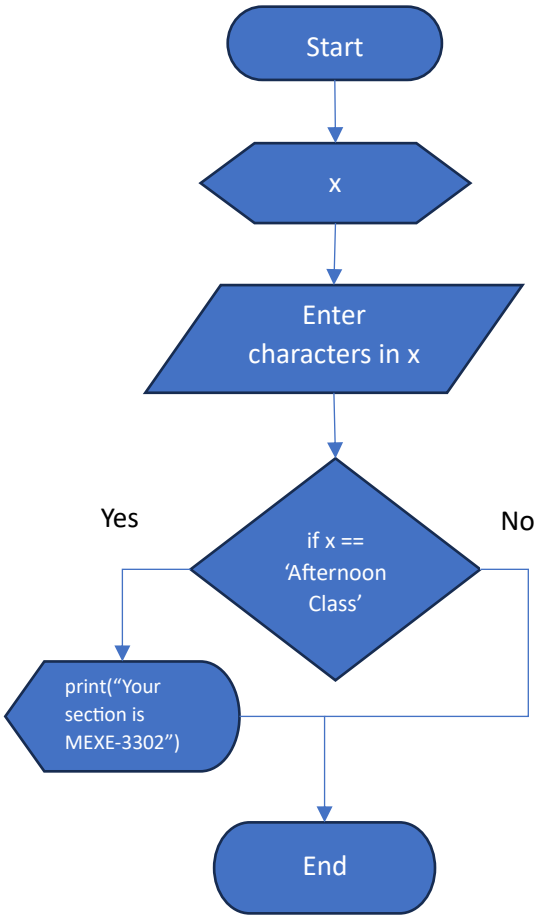
Algorithm:

Step 1: x

Step 2: Enter characters in x

Step 3: if x == 'Afternoon Class'

print("Your section is MEXE-3302")



Example 5

Algorithm:

Step 1: str x

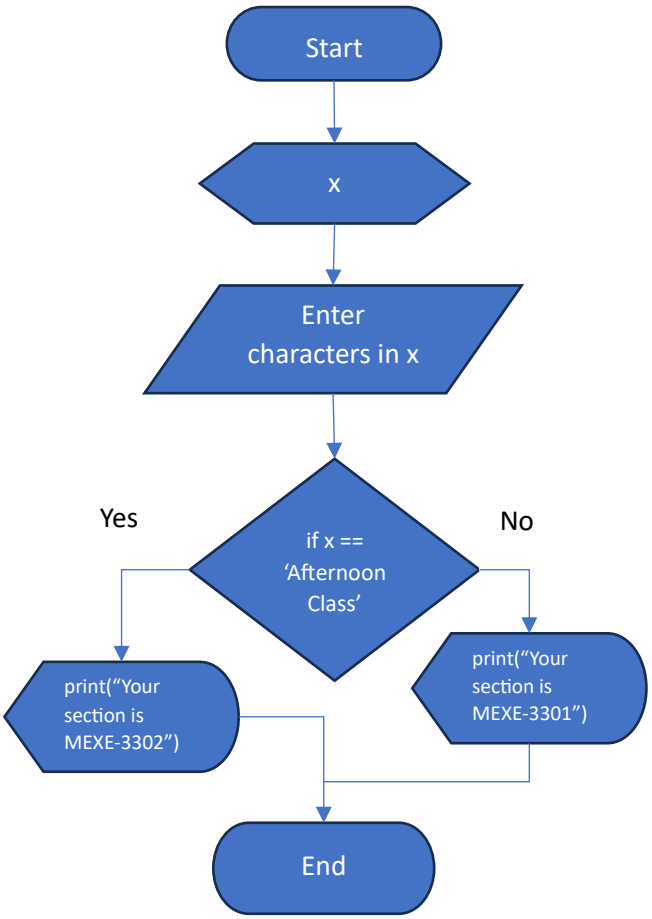
Step 2: Enter x

Step 3: if x == ‘Afternoon Class’;

Serial.print(“Your section is MEXE-3302”)

Step 4: if x == ‘Morning Class’;

Serial.print(“Your section is MEXE-3301”)



Example 6 (Multiple Decision)

Create a flowchart that asks the user to push either of the buttons “FK”, “IK” and “Jacobian”. If “FK” is pushed, print the position vector (x, y, & z); if “IK” is pushed, print the joint variables ($\theta 1$, $\theta 2$, & $\theta 3$); and if “Jacobian” is pushed, print the velocity equation Velocity Equation VE (differential equation). Otherwise, print stop the process.

Pseudocode:

- FK button, IK button, J button
- Button pushed
- If FK button is pushed, display x, y, & z
- If IK button is pushed, display $\theta 1$, $\theta 2$, & $\theta 3$
- If J button is pushed, display VE

Algorithm:

Step 1: FK_button, IK_button, J_button

Step 2: Button pushed = HIGH

Step 3: If FK_ button == HIGH

Serial.print(x, y, & z)

Step 4: If IK_ button == HIGH

Serial.print($\theta 1$, $\theta 2$, & $\theta 3$)

Step 5: If J_ button == HIGH

Serial.print(VE)