Aufgabe 3: Industriell genutzte Protokolle

- Please design your own industrial network for a factory has **12 nodes** (Machines / Sensors) with **at least three different industrial protocols**. Please determine the network throughput and consider all of the required components. Illustrate the distances and the positions of the nodes.

  Consider the standards of the industrial network.

- Please explain what are IoT and Industry 4.0.

- Please compare between two of industrial networking protocols.

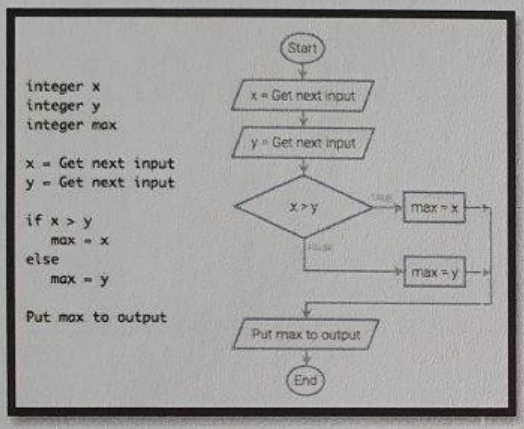
Aufgabe 4: C ++ Programmierung

In this task, please follow the following rules:

1- Please clarify your program objectives, your assumptions and main achievements in your comment at the beginning of the program. */ XXXXXXXXXXX /*

2- Please describe the variables, structures, functions and classes in the line comments of your program // XXX

3- Plot the Float Chart of your program.



Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

4- You program must include **at least**:

a. Two types of Variables
b. One Structure
c. One Pointer
d. One Array
e. Two Functions
f. One Class
g. One Loop
h. One If statement
i. One {Switch or Do While …}
j. One cin and One cout

The program should handle a real case in any of the following problems based on your selection, assumptions, defined problems and functions. You are fully free to select and define YOUR OWN problem YOURSELF and write the program for solving such problem.

Examples of realistic problems you can solve:

1- University & Students:	Students Registration Restaurant Examinations Studying fees ....
2- Libraries:	Books Classifications and Organizations Membership Organization (Registrations, Cancelations, ...) Borrowing Systems (Reminders, Fines, Punishments, Reservations, ...) ....
3- Companies & Shops:	Employee Attendance Management Systems Products Management Systems Pricing and Sales Execution Systems Storages and Inquires Customer Services and Complains Tracking Systems
4- Parking Systems:	Car and Drivers Registration Parking Fees Calculations Free and Busy Places Membership Management System (Yearly, Monthly and Frequent Cards ...) ....
5- Factories and Workshops:	Employees and Handworkers Information Holidays and Vacation Systems Attendance Systems and Working Hours Salaries and Awarding Machines (Documentation, Regular Maintenance Systems, Responsible Persons, ...) ....

Aufgabe 5: Arduino Programmierung

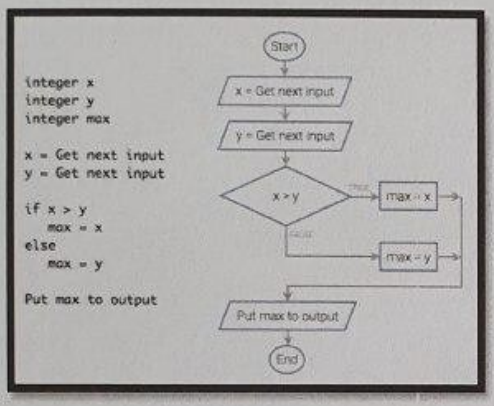
In this task, you will write a programing code for either (Machine, Equipment, Process, System, …) based on Arduino UNU R3 controlling board.

Please follow the following rules:

1- Please clarify your program objectives, your assumptions and main achievements in your comment at the beginning of the program. */ XXXXXXXXXXXX /*

2- Please describe the variables, structures, functions and classes in the line comments of your program // XXX

3- Plot the Float Chart of your program.



Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

4- You program must include **at least**:

k. Two Analogue Inputs
l. Two Analogue Outputs
m. Two Digital Inputs
n. Two Digital Outputs
o. One Sensor
p. One DIP Switch or Keypad
q. One (7 Segment) or LCD

5- Plot the Circuit Diagram of Your Device.