

Technical Skills Assessment Test



Instructions

- 1. Think smart. Be smart. Get smart
- 2. Where Code is required it must be written considering work environment of code is in Arduino or Atmel Studio IDE.
- 3. Atmel 328p will be the controller where the code is meant to execute.
- 4. Document all your progress. We prefer *technical documentation* approach. Document the code used. Also explain your approach throughout process to achieve require goals in detail. We don't have any stringent guideline for documentation. Just make sure you are able to showcase your work in understandable manner.
- 5. It is preferred that code is as optimized as possible.
- 6. Don't forget the stupid semicolon where required.
- 7. Well, enjoy the task there is no fun without it...he.he.
- 8. Best wishes. Do well.

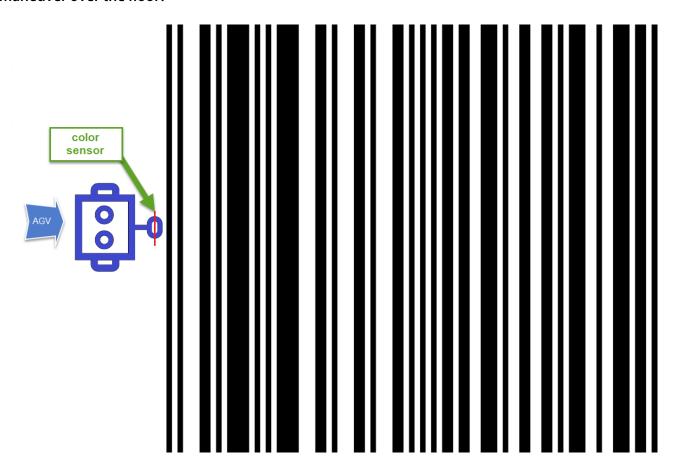
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Assessment Task

1.BLACK AND WHITE

Manoj was working on an AGV.AGV was manufactured to move on Barcode like strips which were made on the floor. AGV consist of an color sensor which return 1 while on white color and 0 while on black .Help Manoj with a code/algorithm to find number of black and white line on floor as the AGV maneuver over the floor?





2.TRICKY MATRIX OPERATION

Lets explain this question with small data sample. Assume a uint16_t datatype was used to store data of 4x4 matrix display.

Input data :0x124F

"0001 0010 0100 1111" Represents "7" in 4x4 matrix display form

1 1 1 1

0 0 1 0

0 1 0 0

1 0 0 0

Functions are needed which manipulate input data to returns a uint16_t data which has property of representing Mirror and Rotation of it when represented in 2d fashion as shown below.

Output:

0X842F 0X9531

Mirror Rotate counter clockwise

Output Data Represents: -

1 1 1 1 1

0 1 0 0

0 0 1 0 1 0

0 0 0 1 1 0 0 1

Mirror

Your task is to do the same with uint_64 datatypes which represents 8x8 matrix data.

Input: 0XFE010101010101FE

Output:

0X7F8080808080807F 0X7E81818181818181

Mirror Rotate

Input: 0X01020408102040FF

Output:

Mirror Rotate

Input: 0X4008021080200401

Output:

Mirror Rotate

Note: -The scripts are meant to run in AVR 8-bit controller hence code accordingly.

Bonus task

Do you have any experience in interfacing sensors, actuators,... and integrating them in any system? If yes, then state which all and document your working related to it in detail.