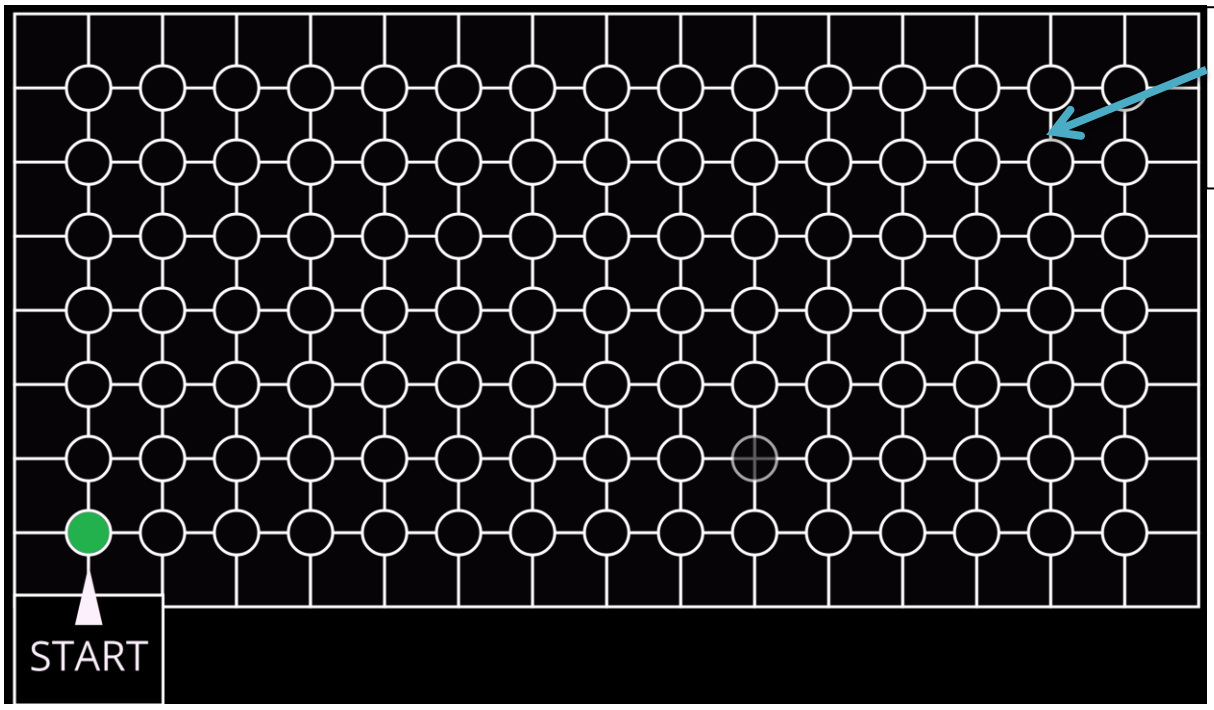
PAC-BOT

The classic game of Pac Man is back to life, only this time it's your bot that will play.

Problem Statement: - The bot has to autonomously collect food items in a grid and reach its final destination.

Arena Description: - The arena will consist of a 128 squares (16 * 8) grid [No. of squares may change] of white coloured lines over a black canvas. As shown in the image below



The length of square and the IR-led dimensions are as given in the arena description below.

(The circles not present in the actual arena, instead there will be tiny LEDs of 0.2cm)

(IMAGE NOT TO SCALE)

GRID DESCRIPTION: -

- The lines will be 2.5 cm wide and white in colour.
- The circles are either tiny LEDs of **maximum 0.2 cm** radius or nothing (Blank positions).
- The boxes will be squares of 25 cm sides of black colour.

---------- [The actual arena image will be uploaded 2 days before the event date]----------

Event description:

1. Each IR led at a food will emit an IR-code which will give the relative position of the next food item.
2. The bot has to decode the code and proceed to the next food item.
3. All 4 adjacent LEDs surrounding the poison will emit an additional danger code (as in mine craft).
4. Any damage to the arena will lead to immediate disqualification.

The robot specifications:

1. The bot should be able to follow a line, i.e. it should have line following capabilities.
2. The maximum dimensions of the robot is 30cm * 20cm (L * B).
3. The bot should be able to decode IR messages, **for tutorial click here.**

There will a total of two rounds:

Round 1: - In this round the arena will contain only food (and no poison). Each food item will have a LED which will provide the relative address of the next food item.

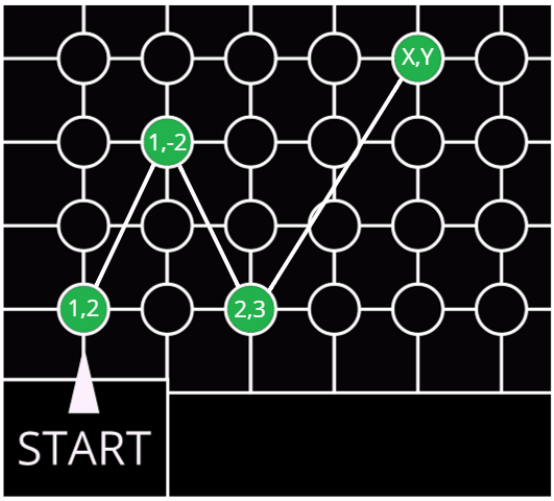
Example: -

The first food says (1, 2) which means
: - Next food is 1 unit left and 2 units up.

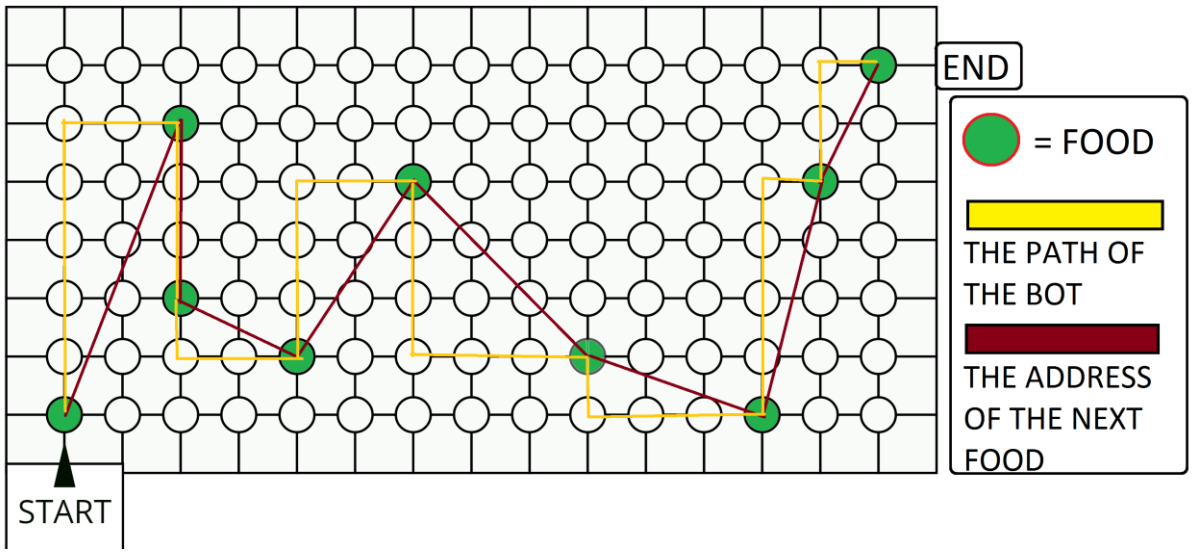
The second food says (1, -2) which means,
: - Next food is 1 unit left and 2 units down.

The Third food says (2, 3) which means,
: - Next food is 2 unit left and 3 units up.

And so on…



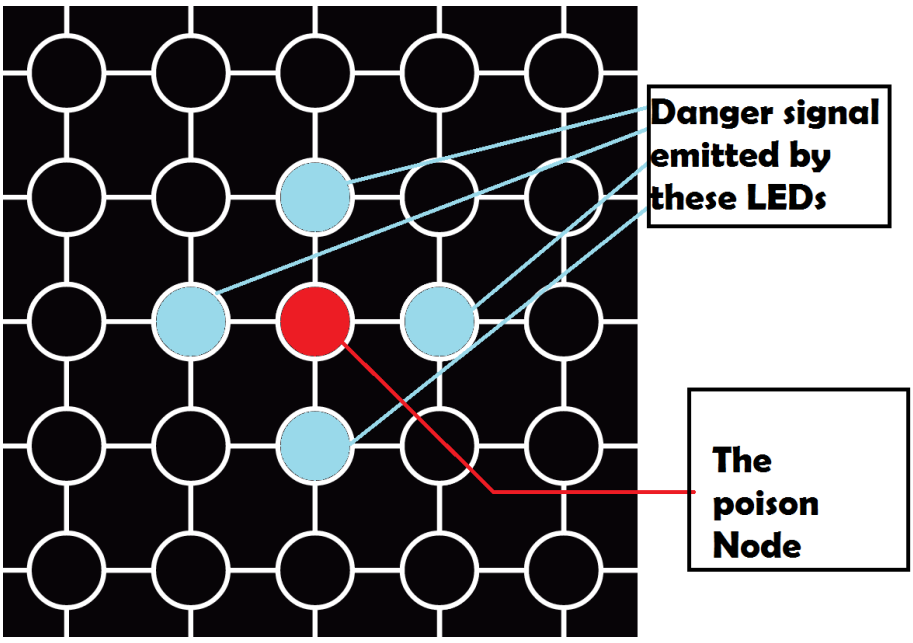
EXAMPLE TRANVERSAL PATH

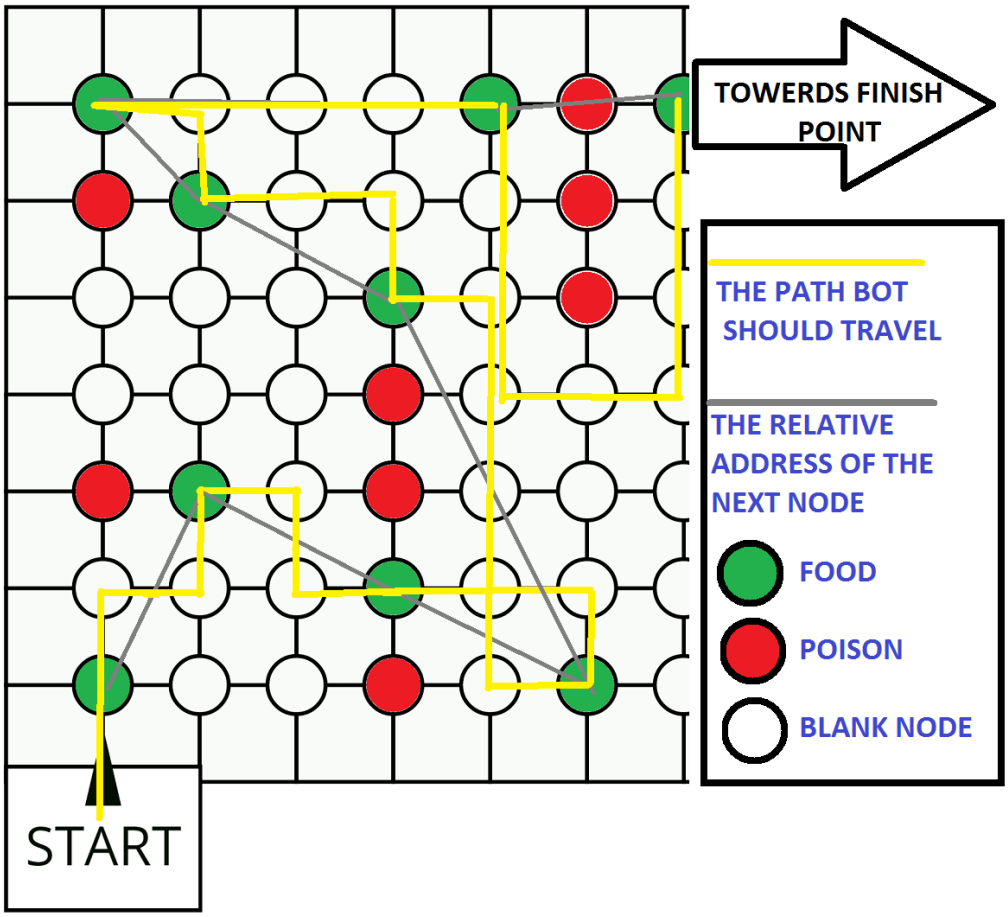


(IMAGE NOT TO SCALE)

Round 2: - Food and poison both will be present. The bot has to collect all food items while avoiding the poison. Each food item will have the relative address of its next food location. All 4 adjacent LEDs surrounding the poison will emit an additional danger code (as in mine craft).

The adjacent LEDs are emitting danger signal as they surround a poison.





IR Code:-

The IR LEDs will emit code modulated over standard 38 kHz frequency. The participants are advised to use TSOP1738 IR detectors for the code detection purpose (For Details **click here**). Exact details about what code is transmitted will be uploaded a week before the event, please keep checking our website for more updated details.

Participants will be given scores based on the following criteria in this round: -

- The total food items collected.
- The total time taken.
- Negative marks for human interventions and poison encounters.

Total score = (No. of (food item – poison item) collected * 100 – Time taken in seconds*5)

(SCORING FORMULEA IS SUBJECT TO CHANGE)

General Rules:-

1. The decision of the event co-ordinator is final in case of any conflict.
2. The participants are to play fair, any unfair means caught will lead to disqualification.