RUBE GOLDBERG

A Rube Goldberg machine is a deliberately over-engineered machine that performs a very simple task in a very complex fashion, usually including a chain reaction. The machine is named after American cartoonist and inventor Rube Goldberg.

PROBLEM STATEMENT:

To crush a softdrink can and throw it in a recycle bin.
(Final step should be to throw the crushed can into the recycle bin)

RULES & REGULATIONS:

- The machine must complete the task as described in the challenge. If not, points kept for the same would be deducted.
- The machine must be no larger than **12 ft. x 12 ft. x 10 ft**. The support from only one wall is allowed (you can use windows if present on that wall) and the top ceiling is not allowed of any form.
- The machine must have a minimum of 15 steps if the machine has less than 15 steps the respective pool would be disqualified from the competition.
- Only one member from the team is supposed to explain their machine before the demonstration.
- The machine will have a 15 minute reset time if they go for more than one run.
- Only one team member may interact with the machine once the evaluation has begun. This includes resetting the machine during the run. This means that only one person will be inside the arena. However if the team goes for another run the restriction of one person inside the arena is uplifted until the machine is ready for the other run.
- Any loose or flying objects must remain within the set boundaries of the machine. This includes, but is not limited to, drops of water, slivers of balloon, and other “small” objects. Steam and other gases are exempt from this rule. However for the sole purpose of electrical connection wires can be outside the boundaries of the machine.
- Each team is supposed to submit a copy of a step-by-step description of their machine. Diagrams and pictures have to be included in this description along with the typed information. If any team fails to submit the copy of the abstract then they will automatically be disqualified from the event. Team is encouraged to submit a video of the running of machine along with the written copy of description. Bonus 5 points would be awarded for the same.
- A step in the machine should be considered a transfer in energy from one action to another action. Identical transfers of energy in secession should be considered one step. For e.g., a set of dominos falling into each other should be considered one step. While technically each single domino falling is a step, stating one hundred steps because of the dominos is repetitive and not in the spirit of Rube Goldberg.
- The task should be completed in not more than 4 min time.
- No hazardous materials or explosives may be used on or within the machine.

- No live animals are allowed in the machine.
- Every team will be given maximum two runs for the completion of the task and if in case a team is not able to complete the task in their first run and they can go for second run.
- For every human intervention the points will be deducted.
- Any destructive action against another machine is grounds for disqualification.
- Programmable Logic Controllers or any other electronic controller/devices may be used on the machines. The use of these devices must be in line with a step. Using these devices as a fail-safe for the machine is illegal and grounds for disqualification.
    - Let's say a ball is supposed to fall onto a switch and turn on a motor which is run by the controller.
        - If the ball misses the switch, but the controller still starts the motor, the controller is not transferring energy from one step to the next step. It is acting as failsafe so the machine can finish and not in line with definition of a step.
        - If the ball hits the switch and the controller starts the motor as it should, the device is merely transferring the energy from one step to another, so this is line with the definition of a step.
    - If a controller/electronic device is used, each instance of its operation should be clearly stated in the step-by-step description submitted along with the written description.
        - Each instance should be considered one step, but please supply detailed information of how the step is being accomplished.

POINTS DISTRIBUTION:

Theme & Descriptions of each task involved:	5 points
Completion of Tasks:	10 points (task is complete) 0 points (no attempt to complete the task was made)
No of Steps:	+1 point for each step after 15 steps (MAX 10 points)
No of Parallel Steps:	+3 point for each parallel step in the machine (MAX 10 points) (a step is considered to be parallel if it triggers chain reactions in 2 or more different chains and they finally merge into a single chain of events)
Complexity & Innovation involved in steps:	10 points
Bonus Point for Video Submission	5 points

PENALTIES:

- Run Length exceeded(-5 points/min)
- Human Intervention
  - First Intervention -2 points
  - Further interventions: -4 points each
- Objects leaving machine (-2 points each)
- Delay in submission: 1 point for each 5 minute of delay

DEADLINES:

Submission of the detailed description of the machine along with the video:
12:30 pm 2nd September

Submission of the key of the room: 12:30 pm 2 September

Note: Exceeding with the submission deadlines would call for a penalty of 1 point for each 5 minutes of delay. Also if delayed by half an hour team would be disqualified.

JUDGING:

The judging of the event will take place from 1:30 pm to 5 pm on 2 September 2012.

CONTACTS:

Ashu Gupta	**ashug@iitk.ac.in**	**7388490053**
Himanshu Aggarwal	**himagg@iitk.ac.in**	**8604548703**