Overview:

The CS2N FTC Block Party – Driver Skills Fall 2013 Challenge is a one-minute long competition utilizing the Robot Virtual Worlds environment. Robots can be programmed with both Driver Control and Autonomous programs in order to score as many points as possible within the one-minute Match length. Multiple elements have been added to the field that allows this game to be solved using autonomous programming, if desired; colored lines and tiles, IR beacons, walls, and designated loading zones can all be used by the Robot’s sensors to compete autonomously. The game’s time is tracked using the RVW game’s Internal Timer, which will be used in the final scoring metric to determine high scores.

A Player can earn points during a Match by placing Blocks into any of the Goals on the Pendulum(s), by placing Blocks onto the Floor Scoring Area(s), by raising a Flag during the End Game period, or by having a Robot Hang using the Pull-Up Bar during the End Game. The Outer Pendulum Goals are worth more points than the Inner Pendulum Goals, which are worth more than the Floor Scoring Areas. If the Pendulum is Balanced at the end of the Match, additional points will be applied to a Player’s total score.

The robot can begin the Match in any of the eight Start Positions (four red, four blue). The Match begins when the Player presses the Game Start Button.
Definitions:

*Autonomous Mode* – The Robot operates and reacts only to sensor inputs and to commands pre-programmed by the player into the onboard Robot control system.

Balanced Pendulum – A Pendulum is considered Balanced if the black ‘needle’ attached to the fulcrum point of the Pendulum is within the white zone of the balance indicator (also attached to the Pendulum).

*Block* – The game object in the FTC Block Party competition that can be Scored in the Inner Pendulum Goals, Outer Pendulum Goals, or Floor Scoring Area for points. A Match is played with 100 Blocks. Each Block Zone contains 50 Blocks at the start of a Match.

*Block Zone* – The areas of the Playing Field where the Blocks are located at the start of a Match. There are two Block Zones on the Playing Field, located in opposite corners of the field. Each Block Zone contains 50 Blocks at the start of a Match.

*Bridge* – The raised structure in the middle of the Playing Field. Two Pendulums are attached to its sides and the Pull-Up Bar resides above it.

*Code* – A program that is loaded into the Robot which enables it to play the Match.

*Driver* – A Player responsible for operating and controlling the Robot.

*Driver Control Mode* – The Robot operates and reacts to commands sent to it in real time by the Player using a joystick controller.
End Game – The final 30 seconds of a Match.

Flag – Either of the two Flags (one red, one blue) located in the corner of the Playing Field. These Flags can be raised by spinning the mechanism at the bottom of the Flag’s pole clockwise during the End Game. The Flag can be raised to a Low Mark or a High Mark.

Floor Scoring Area – The areas (outlined by tape) directly below the Pendulums, extending in a plane upwards to the top of the Pendulum. This plane is shown in Figure 3, below.

![Figure 3: The scoring plane for the Floor Scoring Area.](image)

Game Start Button – This is the button on the user interface that the Player presses to start the Match.

Game Time – The combination of the amount of time that the Match has been running which is measured by the Internal Timer in milliseconds.

Game Time Remaining – The amount of time left in the Match. Each Match is 60 seconds long. Once a player presses the Game Start Button the Game Timer begins to count down from 60 to 0 seconds. When the Game Time Remaining reaches 0, the Match ends.

Hanging – A Robot is considered Hanging if it is supported solely by the Pull-Up Bar and is not in contact with the Playing Field or Bridge. Hanging will only be scored if the Hang is initiated during the End Game. If the Hang is initiated before the End Game, the Robot must completely detach itself from the Pull-Up Bar and reinitiate the Hang during the End Game in order to score points with the Hang.

High Mark – A Flag that is raised above the third black mark (from the bottom) on the Flag’s pole during the End Game is considered to have reached the High Mark. If a Flag is raised before the End Game, the Flag must be fully lowered and re-raised during the End Game in order for it to be worth points.

Inner Pendulum Goal – A rectangular box nearest to the center of a Pendulum. Each Pendulum contains two Inner Pendulum Goals. Blocks can be Scored in an Inner Pendulum Goal for two (2) points each.
Internal Timer – The internal timer is a clock built into the RVW software that tracks the time in milliseconds that the Player has been playing the Match.

Low Mark – A Flag that is raised above the second black mark (from the bottom) on the Flag’s pole during the End Game is considered to have reached the Low Mark. If a Flag is raised before the End Game, the Flag must be fully lowered and re-raised during the End Game in order for it to be worth points.

Match – A Match consists of a one minute (60 seconds) Autonomous Mode programming challenge.

Outer Pendulum Goal – A rectangular box furthest from the center of a Pendulum. Each Pendulum contains two Outer Pendulum Goals. Blocks can be Scored in an Outer Pendulum Goal for three (3) points each.

Pendulum – Either of the red or blue structures attached to the sides of the Bridge in the center of the Playing Field. Each Pendulum contains two Inner Pendulum Goals and two Outer Pendulum Goals.

Player – The person that wrote the code and is playing the Match. The Player must meet all eligibility requirements for the RVW Challenge in order to compete.

Playing Field – The 12’x12’ surface that the Match is played on, designated by the solid walls enclosing it.

Pull-Up Bar – The bar residing above the Bridge that a Robot can Hang from during the End Game for points.

Robot – A programmable object that a Player can load into the virtual world.

RVW – Robot Virtual World

Scored – A Block is considered ‘Scored’ if it resides in an Inner Pendulum Goal, Outer Pendulum Goal, or Floor Scoring Area, including the vertical plane above the Pendulum Goals and Floor Scoring Area. Any Block can only be Scored in one of these areas at a time.

Student – Anyone enrolled in a pre-college school or home-schooled as part of a pre-college educational curriculum.

Scoring Points:

Points can be scored during a Match having the Robot perform the following actions. The Player’s score is the highest score achieved during the Match. Alliance color has no bearing on how an object is scored; this means that both Flags can be raised, the Blocks can be scored in any Pendulum Goal or Floor Scoring Area, and the Robot can Hang from any location on the Pull-Up Bar.

- Each Block placed on a Floor Scoring Area is worth one (1) point.
- Each Block placed in an Inner Pendulum Goal is worth two (2) points.
- Each Block placed in an Outer Pendulum Goal is worth three (3) points.
- A Balanced Pendulum at the end of a Match applies a 1.5x multiplier to all Blocks scored in that Pendulum’s Inner and Outer Goals.
- A Flag that is raised to the Low Mark during the End Game is worth twenty (20) points.
- A Flag that is raised to the High Mark during the End Game is worth thirty-five (35) points.
  - A Flag will only be scored for the highest level Mark it has reached at the end of the Match, and will only be scored if the Flag was raised during the End Game.
- A Robot that is Hanging from the Pull-Up Bar at the end of a Match is worth fifty (50) points.
  - A Robot will only be credited for a Hang if the Hang occurs during the End Game.

Tiebreaker:

If two Players achieve the same score, the tiebreaker will be determined by which Player was able to achieve the high score in the shortest amount of Game Time (tracked by the Internal Timer and displayed as the fractional part of the score).

Divisions:

There will be 3 Divisions for the CS2N FTC Driver Skills Challenge:

- Middle School: For students entering 8th grade or lower at the start of the 2013-2014 school year
- High School: For students entering grades 9th-12th at the start of the 2013-2014 school year
- Open: This division is open to all participants.

Prizes:

A listing of the prizes for the CS2N FTC Block Party – Driver Skills Fall 2013 competition can be found on the CS2N website, cs2n.org.

Other Rules

- Any Player intentionally using glitches or hacks in the RVW environment to obtain a higher score than would normally be possible may be subject to disqualification from the Competition.

- Each Player is eligible for only one prize per Competition. In the case of multiple high scores that are eligible for prizes that are submitted by the same Player, only the highest score will be used in determining prizes for that Player.

- All Players must adhere to the Robot Virtual World Competition Rules as they are written, and must abide by the listed intent of the rules. Every Player has the opportunity to ask for official rule interpretations in the RVW Robotics Competition Question & Answer Forum at www.robotc.net/forums. Any responses in this Q&A forum should be treated as official rulings from the RVW Robotics Competition Game Design Committee, and represent the correct and official interpretation of the RVW Robotics Competition Rules.
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