1. **Project title, names and email addresses of team members**

   NASA LEC Robotic Mining

   Taylor Ertrachter - tertrachter2017@my.fit.edu

   Bailey Hamant - bhamant2017@my.fit.edu

   James Spies - jspies2017@my.fit.edu

   Nathaniel Bouchie - nbouchie2017@my.fit.edu

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   Steven Pazienza - spazienza2017@my.fit.edu

   Alex Perez - aperez2017@my.fit.edu

   Youpeng Xu - yxu2017@my.fit.edu

2. **Faculty Advisor: name and email address**

   Dr. Marius Silaghi - msilaghi@fit.edu

3. **Client: name and affiliation**

   Aerospace NASA Lunabotics Engineering Competition (LEC) and
   Dr. Kimberly Demoret, FIT Aerospace Department

4. Progress of current Milestone (progress matrix)

Task	Completion %	James	Bailey	Taylor	To do
1. Investigate tools	100%	33%	33%	33%	none
2. Hello World demos	100%	33%	33%	33%	none
3. Implement, test & demo *Make robot manually controllable*	100%	20%	20%	40%	Lead screw movement
4. Implement, test & demo *Take accurate measurements with camera*	90%	30%	30%	30%	Depth measurement

5. Discussion (at least a few sentences, ie a paragraph) of each accomplished task (and obstacles) for the current Milestone:

- Task 1: The robot can now be moved forward and backward and it's bucket ladder rotated manually via an Xbox controller. There are a total of four motors on the robot which we've written control code for: one motor controls the left side wheels (front and back), another controls the right side wheels, one motor controls the bucket ladder and the last motor controls the up and down movement of the lead screws. The code and the motors work together on the Jetson, and the bluetooth Xbox controller code takes manual input and activates the motors accordingly. The wheels are moved by setting the rotation angle and adjusting the rotation speed. To enable turning in both directions, contrasting rotation angles are set to the front left and back right wheels for left turning, and the front right and back left wheels for right turning.

- Task 2: The camera currently takes accurate measurements of distance, which is the most important perception for the robot to have when tasked with autonomous movement and mining. While it would be ideal to include other perceptions such as width, height, and depth, the focus of this milestone was more toward getting manual control, and this task is more suitable for working toward full autonomy.

6. **Discussion (at least a few sentences, ie a paragraph) of contribution of each team member to the current Milestone:**
    - Bailey Hamant: Worked on fixing the issue of the Xbox controller not connecting to the Jetson via bluetooth. Diagrammed which motors controlled which part of the robot and which buttons on the Xbox controller controlled which type of movement.
    - James Spies: Figured out which numbers produced certain speeds of wheel rotation and performed tests to ensure speeds, directions, and motors were all being properly executed each time the code was changed and run.
    - Taylor Ertrachter: Altered both the code for the motors and the xbox controller code so that they were usable for what we intended to use them for. Began working with the different type of motor that controls the lead screws to ensure it is activatable and can be programmed to move similarly to the wheels and bucket ladder.
7. **Date(s) of meeting(s) with Client during the current milestone**:
    - March 22
    - March 29
    - April 5
    - April 12
8. **Client feedback on the current milestone**
    - Client discussed with us how she planned to improve next year's software team by expanding their budget, and was pleased with what our team has accomplished under the unique circumstances of this year.
9. **Date(s) of meeting(s) with Faculty Advisor during the current milestone:** .
    - April 12
10. **Faculty Advisor feedback on each task for the current Milestone**
    - Task 1: ...
    - Task 2: …
    - Task 3: ...

Faculty Advisor Signature:  **Date:** 04/10/2021

11. Evaluation by Faculty Advisor

- Faculty Advisor: detach and return this page to Dr. Chan (HC 214) or email the scores to pkc@cs.fit.edu

○ Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Taylor Ertrachter	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Bailey Hamant	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
James Spies	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____