Team G SVD Plan

1. **Image Capture Test**
   a. <u>Objective:</u> Generate a composite image from several images taken at different angles
   b. <u>Location & Setup</u>
      Location: Justin's living room
      - Place camera oriented towards open area of room
      - Hold AprilTag marker within view of camera
      - Markers have pattern to determine pixels per square inch
   c. <u>Equipment:</u> RealSense Camera, PhantomX Pan Tilt, AprilTag Markers
   d. <u>Steps</u>
      - Run tag tracking code
      - Move tag around area in front of camera
      - Output camera view to screen
   e. <u>Success Criteria</u>
      - Pan/tilt turret moves so that tag is within 50 pixels of image center within 3 seconds; image is captured when tag is centered
      - Save >= 5 images captured at different angles in local directory on rover computer
      - Save the data of the pan-tilt angles corresponding to the images

2. **Brinkmanship Test**
   a. <u>Objective:</u> Detect the presence of cliff edge near the robot
   b. <u>Location & Setup</u>
      Location: Justin's front porch
      - Place rover facing cliff edge, several feet away
      - Attach rope to rover for safety
   c. <u>Equipment:</u> "Blue" rover, RealSense camera, rope
   d. <u>Steps</u>
      - Run brinkmanship code, Rover begins to drive towards cliff edge, Rover stops moving when edge is detected, Code logs time-stamped report of edge detection
   e. <u>Success Criteria</u>
      - Rover stops within 0.5 seconds of edge identification
      - Rover stops within 0.25 meters of cliff edge
      - Rover meets above criteria on 5 successive tests

3. **Simulation Test**
   a. <u>Objective:</u> Plan global and local paths through simulated terrain, and execute the planned motion
   b. <u>Location & Setup</u>
      Location: WeBots simulation
      - Initialize simulation with rover surrogate and lunar terrain (including pit)
      - Set waypoints around pit
   c. <u>Equipment</u>
      - Simulation computer
   d. <u>Steps</u>
      - Run simulation
      - Rover navigates route to waypoints defined by global plan
   e. <u>Success Criteria</u>
      - Travel time less than 150% of straight line navigation between waypoints
      - Locally navigate until 1 meter from the edge of the pit
      - End navigation a .45 meters from the center of the waypoint