AA274A Section 4
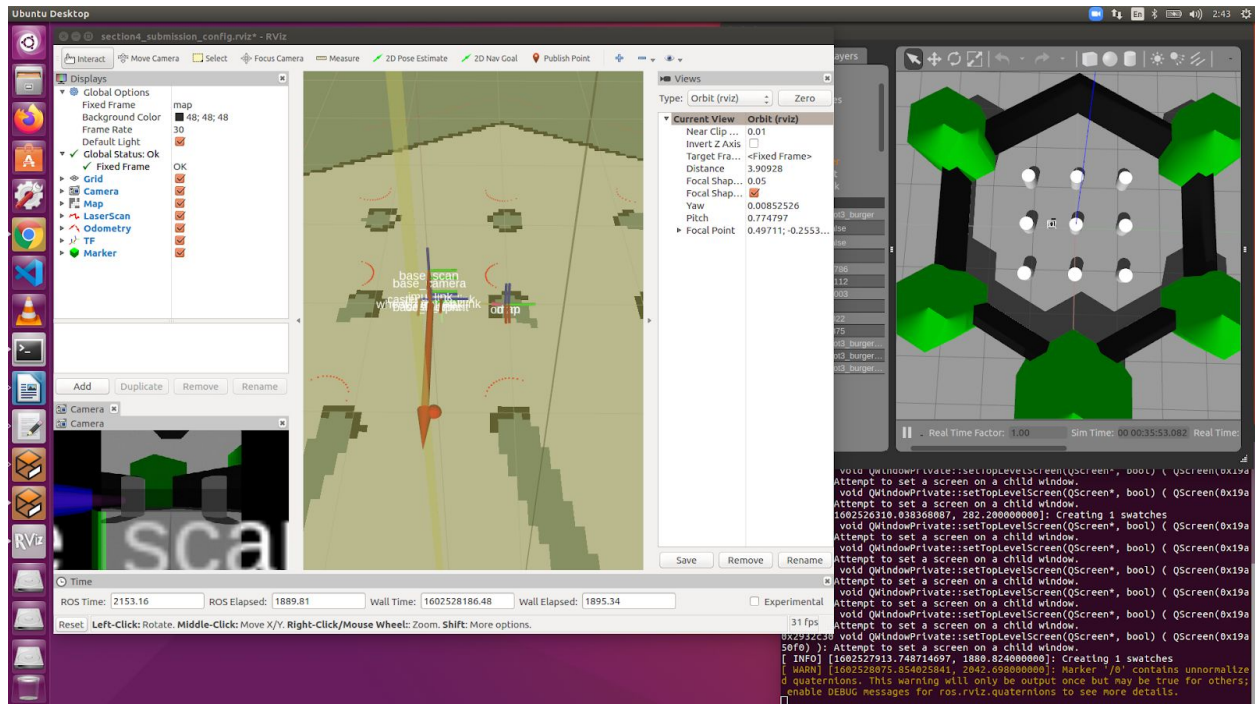
Problem 1:
The following rostopics are available:
```
/camera/camera_info
/camera/image_raw
/camera/image_raw/compressed
/camera/image_raw/compressed/parameter_descriptions
/camera/image_raw/compressed/parameter_updates
/camera/image_raw/compressedDepth
/camera/image_raw/compressedDepth/parameter_descriptions
/camera/image_raw/compressedDepth/parameter_updates
/camera/image_raw/theora
/camera/image_raw/theora/parameter_descriptions
/camera/image_raw/theora/parameter_updates
/camera/parameter_descriptions
/camera/parameter_updates
/clock
/cmd_vel
/gazebo/link_states
/gazebo/model_states
/gazebo/parameter_descriptions
/gazebo/parameter_updates
/gazebo/set_link_state
/gazebo/set_model_state
/gazebo_gui/parameter_descriptions
/gazebo_gui/parameter_updates
/imu
/joint_states
/map
/map_metadata
/odom
/rosout
/rosout_agg
/scan
/tf
/tf_static
/turtlebot3_slam_gmapping/entropy
```

Problem 2 / 4:

Problem 3:

```
Panels:
  - Class: rviz/Displays
    Help Height: 78
    Name: Displays
    Property Tree Widget:
      Expanded:
        - /Global Options1
        - /Status1
      Splitter Ratio: 0.5
    Tree Height: 412
  - Class: rviz/Selection
    Name: Selection
  - Class: rviz/Tool Properties
    Expanded:
      - /2D Pose Estimate1
      - /2D Nav Goal1
      - /Publish Point1
    Name: Tool Properties
    Splitter Ratio: 0.588679016
  - Class: rviz/Views
    Expanded:
      - /Current View1
    Name: Views
    Splitter Ratio: 0.5
```

```yaml
    - Class: rviz/Time
      Experimental: false
      Name: Time
      SyncMode: 0
      SyncSource: Camera
Toolbars:
  toolButtonStyle: 2
Visualization Manager:
  Class: ""
  Displays:
    - Alpha: 0.5
      Cell Size: 1
      Class: rviz/Grid
      Color: 160; 160; 164
      Enabled: true
      Line Style:
        Line Width: 0.0299999993
        Value: Lines
      Name: Grid
      Normal Cell Count: 0
      Offset:
        X: 0
        Y: 0
        Z: 0
      Plane: XY
      Plane Cell Count: 10
      Reference Frame: <Fixed Frame>
      Value: true
    - Class: rviz/Camera
      Enabled: true
      Image Rendering: background and overlay
      Image Topic: /camera/image_raw
      Name: Camera
      Overlay Alpha: 0.5
      Queue Size: 2
      Transport Hint: compressed
      Unreliable: false
      Value: true
      Visibility:
        Grid: true
        LaserScan: true
        Map: true
        Odometry: true
        TF: true
        Value: true
```

```
      Zoom Factor: 1
    - Alpha: 0.699999988
      Class: rviz/Map
      Color Scheme: map
      Draw Behind: false
      Enabled: true
      Name: Map
      Topic: /map
      Unreliable: false
      Use Timestamp: false
      Value: true
    - Alpha: 1
      Autocompute Intensity Bounds: true
      Autocompute Value Bounds:
        Max Value: 10
        Min Value: -10
        Value: true
      Axis: Z
      Channel Name: intensity
      Class: rviz/LaserScan
      Color: 255; 255; 255
      Color Transformer: Intensity
      Decay Time: 0
      Enabled: true
      Invert Rainbow: false
      Max Color: 255; 255; 255
      Max Intensity: 0
      Min Color: 0; 0; 0
      Min Intensity: 0
      Name: LaserScan
      Position Transformer: XYZ
      Queue Size: 10
      Selectable: true
      Size (Pixels): 3
      Size (m): 0.00999999978
      Style: Flat Squares
      Topic: /scan
      Unreliable: false
      Use Fixed Frame: true
      Use rainbow: true
      Value: true
    - Angle Tolerance: 0.100000001
      Class: rviz/Odometry
      Covariance:
        Orientation:
```

```
        Alpha: 0.5
        Color: 255; 255; 127
        Color Style: Unique
        Frame: Local
        Offset: 1
        Scale: 1
        Value: true
      Position:
        Alpha: 0.300000012
        Color: 204; 51; 204
        Scale: 1
        Value: true
      Value: true
    Enabled: true
    Keep: 100
    Name: Odometry
    Position Tolerance: 0.100000001
    Shape:
      Alpha: 1
      Axes Length: 1
      Axes Radius: 0.100000001
      Color: 255; 25; 0
      Head Length: 0.300000012
      Head Radius: 0.100000001
      Shaft Length: 1
      Shaft Radius: 0.0500000007
      Value: Arrow
    Topic: /odom
    Unreliable: false
    Value: true
  - Class: rviz/TF
    Enabled: true
    Frame Timeout: 15
    Frames:
      All Enabled: true
      base_camera:
        Value: true
      base_footprint:
        Value: true
      base_link:
        Value: true
      base_scan:
        Value: true
      caster_back_link:
        Value: true
```

```yaml
        imu_link:
          Value: true
        map:
          Value: true
        odom:
          Value: true
        wheel_left_link:
          Value: true
        wheel_right_link:
          Value: true
      Marker Scale: 1
      Name: TF
      Show Arrows: true
      Show Axes: true
      Show Names: true
      Tree:
        map:
          odom:
            base_footprint:
              base_link:
                base_camera:
                  {}
                base_scan:
                  {}
                caster_back_link:
                  {}
                imu_link:
                  {}
                wheel_left_link:
                  {}
                wheel_right_link:
                  {}
      Update Interval: 0
      Value: true
  Enabled: true
  Global Options:
    Background Color: 48; 48; 48
    Default Light: true
    Fixed Frame: map
    Frame Rate: 30
  Name: root
  Tools:
    - Class: rviz/Interact
      Hide Inactive Objects: true
    - Class: rviz/MoveCamera
```

```
      - Class: rviz/Select
      - Class: rviz/FocusCamera
      - Class: rviz/Measure
      - Class: rviz/SetInitialPose
        Topic: /initialpose
      - Class: rviz/SetGoal
        Topic: /move_base_simple/goal
      - Class: rviz/PublishPoint
        Single click: true
        Topic: /clicked_point
    Value: true
    Views:
      Current:
        Class: rviz/Orbit
        Distance: 8.44067097
        Enable Stereo Rendering:
          Stereo Eye Separation: 0.0599999987
          Stereo Focal Distance: 1
          Swap Stereo Eyes: false
          Value: false
        Focal Point:
          X: 0.338685662
          Y: 0.0655333027
          Z: 0.480599493
        Focal Shape Fixed Size: true
        Focal Shape Size: 0.0500000007
        Invert Z Axis: false
        Name: Current View
        Near Clip Distance: 0.00999999978
        Pitch: 1.56979632
        Target Frame: <Fixed Frame>
        Value: Orbit (rviz)
        Yaw: 0.0385308154
      Saved: ~
Window Geometry:
  Camera:
    collapsed: false
  Displays:
    collapsed: false
  Height: 905
  Hide Left Dock: false
  Hide Right Dock: false
  QMainWindow State:
```
000000ff00000000fd0000000400000000000016a000002fffc0200000009fb00000
01200530065006c0065006300740069006f006e00000001e10000009b0000006100ff

fffffb0000001e0054006f006f006c002000500072006f00700065007200740069006
5007302000001ed000001df00000185000000a3fb0000001200560069006500770073
00200054006f006f02000001df0000021100000185000000122fb000000200054006f0
06f006c002000500072006f00700065007200740069006500730032030000002880000
011d000002210000017afb000000100044006900730070006c006100790073010000000
0280000022b000000d700ffffffffb0000002000730065006c006500630074006f006f
006e00200062007500660066006500720200000138000000aa0000023a00000294fb0
0000014005700690064006500530074006500720065006f02000000e6000000d20000
03ee0000030bfb0000000c004b0069006e006500630074402000001860000010600000
30c00000261fb0000000c00430061006d00650072006100610100000259000000ce000000
1600ffffff000000010000010f000002fffc0200000003fb0000001e0054006f006f0
06c002000500072006f00700065007200740069006500730100000041000000780000
000000000000000fb0000000a0056006900650077007301000000280000002ff000000ad0
0ffffffffb0000001200530065006c006500630074006f006e010000025a000000
b200000000000000000000000020000049000000a9fc0100000001fb0000000a00560
0690065007700730303000000004e00000080000002e10000019700000003000004b00000
003efc0100000002fb00000008005400690006d0065010000000000004b0000003000
0ffffffffb00000008005400690006d00650100000000000000450000000000000000000
00022b000002ff0000004000000040000008000000008fc0000001000000020000
0010000000a0054006f006f006c0073010000000fffffff0000000000000000
  Selection:
    collapsed: false
  Time:
    collapsed: false
  Tool Properties:
    collapsed: false
  Views:
    collapsed: false
  Width: 1200
  X: 70
  Y: 32