EE 251: Homework 6

All programs must be emailed. Please follow the following steps

1. It is probably easier if you create a directory for each homework set, e.g., `hw6`
2. Name each problem as `prob_x_y.c`, where `x` is the problem number and `y` is the subproblem if any, e.g., `prob_1_a.c` If there are no subpart to the problem then just use the format `prob_x.c`
3. Zip all the files (or the directory for that homework if you made one) using the following command

   ```
   tar -czvf lastname_firstname_hw6.tar.gz prob_1.c prob_2_a.c
   ```

   or if you put all the files for a particular homework in its own directory

   ```
   tar -czvf lastname_firstname_hw6.tar.gz hw6
   ```

   Don't forget to change `lastname_firstname` with your last and first name
4. Email me you .tar.gz file with EXACTLY the following as the subject

   ```
   spring 2015 ee251 hw6
   ```

1. Given a complex number represented as

$$x = a + bj = re^{j\theta}$$

   (a) Write an expression for adding two complex numbers in cartesian form
   (b) Write an expression for multiplying two complex numbers in cartesian form
   (c) Write an equation for computing r and θ in terms of a and b
   (d) Write an expression for multiplying two complex numbers in polar form

2. Write a structure that represents a complex number in cartesian form

3. Write a structure that represents a complex number in polar form

4. Write the following c-functions

   (a) a function that adds two complex numbers in cartesian from
   (b) a function that multiplies two complex numbers in cartesian from
   (c) a function that converts from cartesian to polar
   (d) a function that converts from polar to cartesian
   (e) a function that adds two complex numbers in polar from
   (f) a function that multiplies two complex numbers in polar from

5. Write a test program that allows the user to enter two complex numbers in cartesian form and it outputs:

   (a) the addition of the two numbers in cartesian form
   (b) the multiplication of the two numbers in cartesian form
   (c) the addition of the two numbers in polar form
   (d) the multiplication of the two numbers in polar form