CS 429 Homework 9

Name: ———————————— Section #: ————————————

Instructions: Work these problems on your own paper. As usual, you may collaborate with your classmates and ask for assistance from the TA. But don't copy anyone else's answer. Each problem is worth the same number of points (more or less).

1. In slideset 12, we took several Y86 instructions and "microcoded" them into a set of lower level steps in six phases. For example, slide 14 shows how to do this for `rmmovq`. Do a similar thing for the following additional instructions:

   (a) `nop`
   (b) `mrmovq`
   (c) `irmovq`
   (d) `pushq`

2. Do problem 3.69 on p. 321 of Bryant and O'Hallaron.

3. Do problem 3.70 on p. 322 of Bryant and O'Hallaron.

4. Write an HCL description of the functionality of the "PC Increment" component of the Fetch stage of the datapath (slide 5 of slideset 13). Use icode and PC as the inputs, not need_valC and need_regIds.