

Last Name	
Student Number	
Lab Section Number (Circle your lab section #) (Hint: it's the same one you click to submit a lab)	1 2 3 4 5 6

Instructions:

- 1) There are 4 questions on this test . If this were a real test it would be worth 30% of your final mark.
- 2) There is a time limit of 1 hour.
- 3) Write your answers on the blank sheets provided. Make sure you put your name and student # on everything
- 4) Clearly identify which question you are answering.
- 5) Please include comments to explain what you are doing.

Question 1: (6 marks) Write a java program which asks the user to input their last name. The program should output their name one per line. For example:

Please enter your name: ALEX

A
L
E
X

Question 2: (8 marks) Write the java class (no need for the complete application) called Rotate. The class should have a constructor method which looks like the following;

```
public roto(int a, int b, int c)
```

The constructor will take the values of a, b and c and store them in instance variables. Rotate has one other method named spin which looks like the following;

```
public void spin()
```

Each time spin is called it should make a = b, b = c and c = the old a.

Your main method should invoke the constructor to create an object of that class and then use spin to spin the values. There is no need for output.

Question 3: (8 marks) Write a java applet (you can use ccj if you like) which makes the String "I am happy in CPS109" randomly jump around the browser window. You should clear the window after each time you output the string.

Question 4: (8 marks, 2 mark per question) Answer each question in the space provided

- 1.) Draw the Von Neumann architecture for a single bus computer.
- 2.) The reason I cannot execute a compiled java class directly is...
- 3.) What is the difference between a class variable and an instance variable
- 4.) Give the differences between a java application and an java applet