

# BASIC SYNTAX ASSIGNMENT

Marks: 20

Due:

**Complete all programs and print them out by the end of the day on the due date.**

1. Get a string from the user and output a "Hollow Square" using the string. For example, given the string "four" your program would print:

```
fourf
r    o
u    u
o    r
fruof
```

Save as BasicAssign1.java (3 marks)

2. Get a line of text from the user and replace each sequences of blanks in the string with a single blank. E.g. "this is only a test" → "this is only a test"

Save as BasicAssign2.java (4 marks)

3. Write a program that allows the user to enter the co-ordinates of a point (x,y) and a line (x1, y1, x2, y2) and tells them is the point is on the line or not. You do not need to look up some complicated formula, instead look in the Java API. You will want to look at Point2D and Line2D. (note: contains does not work because Lines have no area)

Save as BasicAssign3.java (3 marks)

4. I've been told that in the average class of 30 students that the odds of two students having the exact same birthday is better than average. Write a program that experimentally determines the average size group that has two people with the same birthday. For the sake of this experiment you may assume that there are no leap years. Conduct the experiment generating birthdays until you generate a repeat. Repeat this process 10000 times and output the average number of dates you generated for each group.

Save as BasicAssign4.java (5marks)

5. A common feature in product codes is to have an internal validation to ensure there is no mistake in the code. Write a program that reads in a product code and outputs whether it is valid or not based on some simple rules.

## The rules:

1<sup>st</sup> part can contain only capital letters and 6 digits. 2<sup>nd</sup> part is alldigits and = the product of the first 6 digits taken in groups of two from the left.

eg: AX6BYU56UX6CV6BNT7NM 287430

is valid because  $65*66*67 = 287430$ .

Save as BasicAssign5.java (5 marks)