Computer Programming
Lab 3

2017

유연일(Yeonil Yoo) & 정원일(Wonil Jeong)

Contact

Email: cp2017ta@tcs.snu.ac.kr

Kakao open chat: https://open.kakao.com/o/geg9SaA

(you may ask in Korean or English)

You may use your own laptop, personal choice of IDE

Programming midterm and final will be open note (no internet)

Assignment 1 due 29th

To do

Write a java program that will take an integer input and determine if input is power of 2 or not in **single** if-else statement without any loop or method

hint: use bitwise operator and(&) or(|) xor(^)

```
A = 17
B = 7
A & B = 1
A | B = 23
A ^ B = 22
```

Flat Plane

In 3-dimensional space, a flat-plane can be generated at least by three dots.
Three dots should not be in a line.

e.g) (1, 1, 1), (1, 1, 2), (3, 4, 5) => -3x-2y+5 = 0

e.g.) (0,0,1), (-1,1,2), (-4,4,5) => in a line!

e.g.) (0,0,1), (-1,1,2), (-4,4,5), (0,0,0) => 1 plane [-x+y=0]

$$
\begin{aligned}
\mathbf{u} \times \mathbf{v} &= (u_1\mathbf{i} + u_2\mathbf{j} + u_3\mathbf{k}) \times (v_1\mathbf{i} + v_2\mathbf{j} + v_3\mathbf{k}) \\
&= u_1v_1(\mathbf{i} \times \mathbf{i}) + u_1v_2(\mathbf{i} \times \mathbf{j}) + u_1v_3(\mathbf{i} \times \mathbf{k}) + \\
&\quad u_2v_1(\mathbf{j} \times \mathbf{i}) + u_2v_2(\mathbf{j} \times \mathbf{j}) + u_2v_3(\mathbf{j} \times \mathbf{k}) + \\
&\quad u_3v_1(\mathbf{k} \times \mathbf{i}) + u_3v_2(\mathbf{k} \times \mathbf{j}) + u_3v_3(\mathbf{k} \times \mathbf{k}) \\
&= (u_2v_3 - u_3v_2)\mathbf{i} + (u_3v_1 - u_1v_3)\mathbf{j} + (u_1v_2 - u_2v_1)\mathbf{k}
\end{aligned}
$$

To do 2

Given five 3D dots, count the maximum possible number of flat planes generated by the five dots. You can assume more than 3 dots are not in the same plane.

[input]: 1,2,3[Enter]2,4,5[Enter]3,1,3[Enter]1,1,1[Enter]1,3,4

[output]: 10