



# Recitation Class 01 for VG101

Date: 2012 / 09 / 17

Wang Qian

# Self Introduction

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recommended subject: “[VG101] A problem about ...”  
the most formal way to contact with TA
- Tel: 18817519155  
short message > a phone call
- QQ: 372284362

# Course Introduction

- Lecture: the most important part of this course
- Lab: do some challenging exercises
- Office hour: personal problems (e.g. software installation)
- Recitation class: review + preview
  
- Homework: not so difficult
- Lab exercise: we will try to make it more interesting
- Exam: no discussion, maybe more difficult than last year

# Honor Code

- How to discuss with other students?
  - Don't show your code to others.
  - Don't write down anything specific to others.
- How to help others with a problem?
  - Tell them the way of thinking instead of the answer.
  - Tell them the way to debug but never do it for them.
- What are not allowed during the lab?
  - Don't copy others' code (even from another section).
  - Don't sign for others.
  - Don't print the answer directly on the screen.

# Honor Code

- What are not allowed during the exam?
  - Don't use a flash disk to share your code.
  - Don't use mobile phone.
  - Don't browse online or chat online.
  - Don't try to open the encrypted rar file.
- What are the serious consequences?
  - No points and full grade reduction.
  - No scholarship, TA or even Dual Degree.
  - No honors for his or her class.

# Programming Languages

- Machine language
- Assembly language
- High-level language

FORTRAN 1957

Pascal 1968

**C** 1969

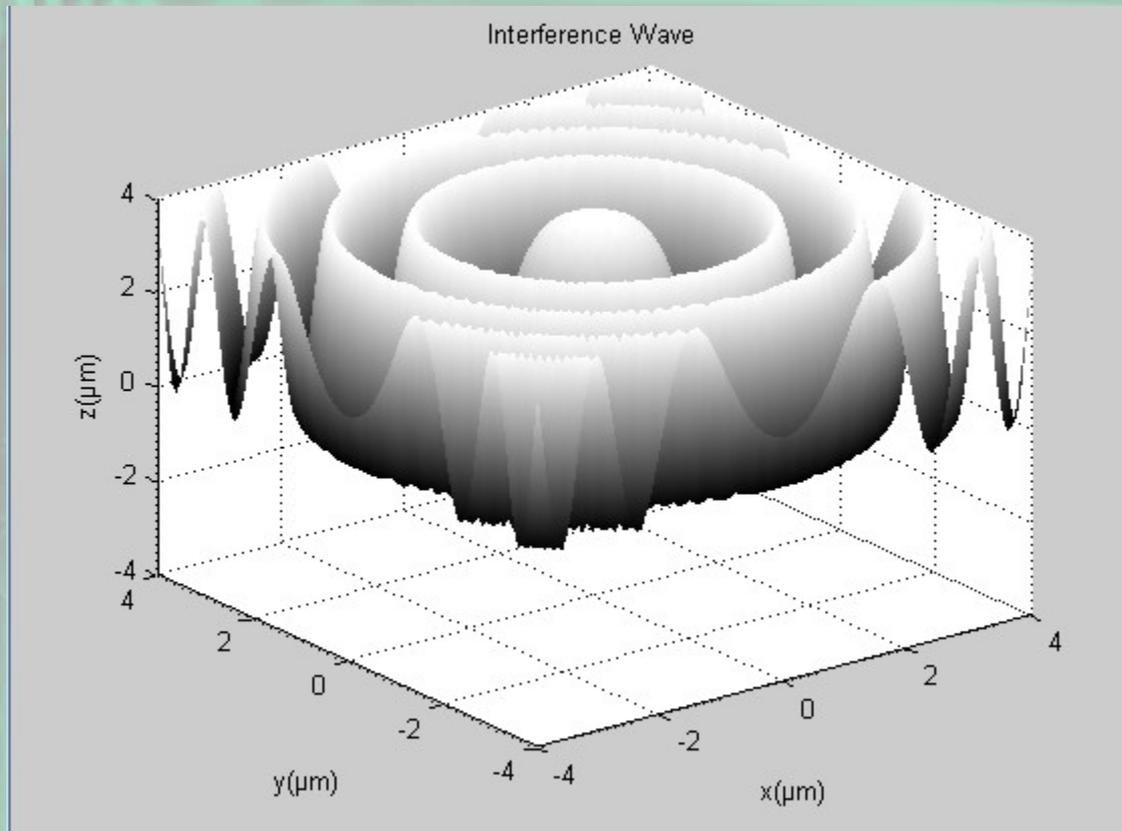
**C++** 1983

JAVA 1995

**MATLAB** 1984

Mathematica 1988

# Programming Languages



# Programming Languages

Position Sep 2012	Position Sep 2011	Delta in Position	Programming Language	Ratings Sep 2012	Delta Sep 2011	Status
1	2	↑	C	19.295%	+1.29%	A
2	1	↓	Java	16.267%	-2.49%	A
3	6	↑↑↑	Objective-C	9.770%	+3.61%	A
4	3	↓	C++	9.147%	+0.30%	A
5	4	↓	C#	6.596%	-0.22%	A
6	5	↓	PHP	5.614%	-0.98%	A
7	7	=	(Visual) Basic	5.528%	+1.11%	A
8	8	=	Python	3.861%	-0.14%	A
9	9	=	Perl	2.267%	-0.20%	A
10	11	↑	Ruby	1.724%	+0.29%	A
11	10	↓	JavaScript	1.328%	-0.14%	A
12	12	=	Delphi/Object Pascal	0.993%	-0.32%	A
13	14	↑	Lisp	0.969%	-0.07%	A
14	15	↑	Transact-SQL	0.875%	+0.02%	A
15	39	↑↑↑↑↑↑↑↑↑↑	Visual Basic .NET	0.840%	+0.53%	A
16	16	=	Pascal	0.830%	-0.02%	A
17	13	↓↓↓	Lua	0.723%	-0.43%	A-
18	18	=	Ada	0.700%	+0.02%	A-
19	17	↓↓	PL/SQL	0.604%	-0.12%	B
20	22	↑↑	MATLAB	0.563%	+0.02%	B

<http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html>

# Computer Hardware

- Central Processing Unit:
  - The most important part of a computer.
  - Carry out instructions and data, then execute.
  - Intel core i7



# Computer Hardware

- Internal Memory:
  - A place to store the data before they are executed.
  - AMD memory



# Computer Hardware

- External Memory:
  - USB flash disk, SD card, CD, floppy disk
  - Like the bookshelf (V.S. the bag)
  - Kingston USB flash disk



[http://www.kingston.com/cn/usb/personal\\_business#dt101g2](http://www.kingston.com/cn/usb/personal_business#dt101g2)

# Computer Hardware

- I/O devices:
  - Devices allowing user to input the data and to output results.
  - Logitech G600 MMO Gaming Mouse



<http://www.logitech.com/en-us/mice-pointers/mice/g600-mmo-gaming-mouse>

# Data Storage

- Two important concept: address and content
- Different data types have different data size.
- Close relation to the pointer.
- Learn more in the future. Don't worry.
- e.g. in C++:
  - char 1 byte; int 4byte; double 8 byte ...

# Numeral system

- The most important part in today's recitation class.
- Discuss the positive integers for preview.
- Def.

- For a positive integer N:

$$N = \sum_{k=0}^t a_k * b^k \quad ( 0 \leq a_i < b , a_i \text{ is a positive integer } )$$

- Conversion:

- Base of 2 and base of 16 (every 4 bits)

e.g.  $(11010011010)_2 = (69A)_{16}$

- Base of 10 to base of K (strategy: division)

e.g.  $(471)_{10} = (111010111)_2$

- Base of K to base of 10 (strategy: multiplication and addition)

e.g.  $(10BF)_{16} = 4287$

# Numeral system

- Easy problems:

$$(2345)_8 = ( \quad )_{10}$$

$$(2345)_{10} = ( \quad )_8$$

$$(2345)_{16} = ( \quad )_{10}$$

$$(2345)_{16} = ( \quad )_2$$

# Numeral system

- Easy problems:

$$(2345)_8 = (1253)_{10}$$

$$(2345)_{10} = (4451)_8$$

$$(2345)_{16} = (9029)_{10}$$

$$(2345)_{16} = (10001101000101)_2$$

# Numeral system

- Challenging Problem: (Beyond this course)
- Tom has twenty-seven iron balls in total. One of these balls is a little bit heavier than the other twenty-six balls. We now call this ball “lucky ball”. How to find this “lucky ball” within three times, if Tom has an accurate balance?

# Numeral system

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- Hint: consider the numeral system with the base of 3.