

# CS1102 Introduction to Computer Studies

## Lecture 01 Introduction

**Not to be redistributed  
to Course Hero or any  
other public websites**



Semester A, 2020-2021  
Department of Computer Science  
City University of Hong Kong



# Teaching Patterns

- Lectures (2 hours per week)
  - Explain the terminologies, concepts, methodologies...
- Labs (2 hour per week)
  - Hands-on programming activities and discovery exercises

# Teaching Team

- 2 Lecture Sessions by Dr. Howard Leung:
  - Tuesday, 12:00-13:50
  - Tuesday, 15:00-16:50
- 11 Lab Sessions:
  - Additional help from many research students

# Course Intended Learning Outcomes (CILO)

1. Describe the basic principles of computer systems, networks, Internet and information security;
2. Inquire and evaluate the social, ethical, and safety issues of emerging technologies and innovations;
3. Demonstrate the use of software tools and the ability to write simple programs using a scripting language;
4. Apply basic programming concepts and trace the execution of simple computer programs.

# Course Materials

- All materials related to this course will be posted on the **Canvas course page** <https://canvas.cityu.edu.hk/>
- It is **your own responsibility** to check for updated information and announcements on the Canvas course page
- In addition to the Canvas course page, sometimes the instructors may send emails to students for issues related to this course, so **check your email regularly** and reply promptly in case we ask you to do something

# Textbook

- Computing Essentials 2019, by Timothy J O'Leary, Linda I. O'Leary and Daniel O'Leary, McGraw Hill Education, ISBN: 978-1-260-09856-3



# Assessment Patterns

- Course work (40%)
  - Homework from Canvas and Lab Activities (10%)
  - Midterm (20%)
  - Project (10%)
- Examination (60%)
- Passing Criteria
  1. at least 30% of the maximum mark for the examination must be obtained; and
  2. at least 35% of the maximum mark for the overall course grade must be obtained

# Lab Information (1)

- Hands-on programming activities and discovery exercises will be given in the weekly 2-hour lab session
- **You should only attend your registered lab session** by clicking on the corresponding Zoom link from the Canvas course page
- You are expected to complete a particular lab in class in a particular week
- You should do the work yourself, and follow the lab instructions step by step, especially if this is your first programming course
- For the programming exercise, you should try to come up with the code yourself as much as possible
  - Do not be afraid of making mistakes, since debugging (finding out where your code goes wrong and fixing it) is part of the learning process



# Lab Information (2)

- We do not give out model programs to the exercises
  - There can be multiple ways to write the code that solves the same problem
  - It is important that you build up the program logic yourself instead of merely looking at some code that you do not understand
  - At any time if you are lost or if you have any questions, feel free to ask the instructor, tutor, or teaching assistant and we will be very happy to help you
- The lab tasks are designed to be relatively simple
  - You can take the time to think about the related underlying concepts
  - We also encourage you to discover things on your own which may not be specified in the tasks
  - Take your time to explore in order to maximize your learning experience and do not try to rush into things

# Lab Information (3)

- Over 300 students from various colleges and departments have enrolled in this course so students have diverse background (e.g., have already taken ICT, no prior experience in computer technologies, etc.). If you feel that

## A) The tasks are NOT trivial

- Take your time to read the instructions and work on the tasks
- Feel free to ask the teaching assistants if you have any questions
- There is no need to compete with other students who may require less time to finish the tasks

## B) The tasks are trivial

- Try to explore around to discover things that we have not covered
- If you feel that the lab activities are too simple for you, notify the course coordinator Dr. Howard Leung by email [howard@cityu.edu.hk](mailto:howard@cityu.edu.hk) and he will design more challenging tasks for you

# Misconception 1

## Misconception

- The lab content should cover the same topic as the lecture delivered in the same/previous week

## Fact

- The lab is focused on programming while the lecture is focused on terminologies, concepts, etc. While some labs have close relations with the corresponding lectures such as binary number, Boolean, conditionals, loops, etc., other labs may contain hands-on exercises for training students' programming skills and may not have direct relation with the lecture in the same/previous week

# Misconception 2

## Misconception

- There is no need to read the details of the lab instructions in order to complete the lab tasks

## Fact

- It may be true that some students may be very smart that they do not need to read the details of the lab instructions in order to complete the lab tasks, which is fine
- Some students however ignore the details of the lab instructions even if they are not very strong in programming (e.g., they just read the figures and/or simply copy the sample code without reading the corresponding descriptions), which is NOT good as they may not be able to put the pieces together, or they may do the tasks incorrectly

# Misconception 3

## Misconception

- If a student is able to finish all tasks in the lab and gets high marks in the lab assessment, then he/she must do well in midterm/exam

## Fact

- If a student just rushes into completing the lab tasks and leaves as soon as possible, then the student may not have deep understanding of the related concepts, and may not be able to do well in midterm/exam
- Students should take the time to think about the related underlying concepts in completing the lab tasks
- Students should complete all tasks in class or after class and re-do them if necessary until they have a complete understanding

# Misconception 4

## Misconception

- One can master programming skill by merely looking at the sample code

## Fact

- Looking at sample code is the first step in learning programming, but it is not sufficient to master programming skill by this step alone
- Students need to try to write the programs themselves. It is likely that they would not get the fully working program in their first attempt so they need to identify the errors and correct their code, which may take several iterations. It is through this process in which students improve their programming skill. This process may require less time as the student's programming skill improves
- Students should work on the lab tasks by themselves if they want to learn programming

# Misconception 5

## Misconception

- Anyone can easily pass this course without putting in any effort

## Fact

- Some students may have already learnt some of the course content, however, there are always materials that students have not learnt before. The amount of new materials varies with each student depending his/her previous background
- It will be very risky for a student to take the exam without any preparation and they may fail

# Misconception 6

## Misconception


- One can pass this course as long as the exam mark is over 30 (out of 100)

## Fact

- Getting over 30% in the exam is only one of the conditions in passing this course. There is another condition that the overall course grade should be at least 35%
- For example, if a student has 0 in the coursework grade (not showing up in any labs, not submitting the online homework, absent in the project presentation, and absent in the midterm), that student would still fail the course even if he/she obtains 50 (out of 100) in the exam



# How Can You Become More Effective Learner?

- Take initiative in your learning
- Be prepared to the class (try to read the materials before hand)
- Attend and participate in all classes (both lecture & lab) 
- Submit assignments on time
- Do the work on your own
- Don't be afraid of asking questions (during or outside class time)
- Refrain from academic dishonest behavior

# When you have questions

- During class, you can type up your question in the chat window or you can click the raise hand button to catch the lecturer or tutor's attention
- You can check out the Discussion on the Canvas course page to see if other students have asked the same question. If not, then you can post your question there
- In case your question is more personal, then you can send email to the Course Leader or your lab tutor

# Tips on writing email

- Put own a meaningful subject (do not leave it blank)
- Include CS1102 in the subject if your email is related to this course
- In the message, first address the person whom you are writing to
- Be concise about your message
- Be courteous
- At the end of the message, put down your name
- Proof read your message to make sure that there is no error and that your message is clear before sending out

# How Much Time You Should Spend on This Course?

- According to University Guide, 1 credit unit = 40 to 50 hours (including lecture, tutorial/lab, self study)
- This course has 3 credit units, which translates to 120 to 150 hours per semester or 10 hours per week
- As you spend 4 hours on lecture and lab, you should spend about 6 hours self-study and practice

# Discovery-Enriched Curriculum (DEC)

- Link: <http://www.cityu.edu.hk/provost/dec/>
- Discovering knowledge that is new to:
  - the student and
  - the field (the discipline(s) that the student is studying)
- CityU teachers are making discovery/innovation/creativity a focus in their course delivery to provide a foundation and/or opportunity for every student to make his or her original discovery/discoveries



# Academic Honesty

[http://www.cityu.edu.hk/provost/academic\\_honesty/rules\\_on\\_academic\\_honesty.htm](http://www.cityu.edu.hk/provost/academic_honesty/rules_on_academic_honesty.htm)

- Academic honesty is central to the conduct of academic work. Students are expected to present their own work, give proper acknowledgement of other's work, and honestly report findings obtained
- **Academic dishonesty** is regarded as a **serious academic offence** in the University. Any related offence may lead to **disciplinary action with a penalty including without limitation**, expulsion from the University, debarment from re-admission, deprivation of an academic award already conferred or revocation of a certification granted

# Academic Dishonesty

[http://www.cityu.edu.hk/provost/academic\\_honesty/rules\\_on\\_academic\\_honesty.htm](http://www.cityu.edu.hk/provost/academic_honesty/rules_on_academic_honesty.htm)

- Academic dishonesty includes but is not restricted to the following behaviors:
  - Plagiarism, e.g., the failure to properly acknowledge the use of another person's work or submission for assessment material that is not the Student's own work;
  - Misrepresentation of a piece of group work as the Student's own individual work;
  - Collusion, i.e., allowing another person to gain advantage by copying one's work;
  - Unauthorized access to an examination/test paper;
  - Possession/use of unauthorized material in assessment;
  - Unauthorized communication during assessment;
  - Use of fabricated data claimed to be obtained by experimental work, or data copied or obtained by unfair means;
  - Impersonating another Student at a test or an examination or allowing oneself to be impersonated;
  - Use of fraudulent documents and/or information to gain advantage for any academic work, e.g. submission of a fraudulent medical certificate to request for a make-up examination

# Academic Honesty Case Studies

[http://www6.cityu.edu.hk/ah/case\\_study.htm](http://www6.cityu.edu.hk/ah/case_study.htm)

Do students in the following cases demonstrate academic honesty?

## Case 1

- Chi Wai did some research on the Internet and found some useful sources for his assignment. He used the ideas from these sources but forgot to cite the sources in the text of his assignment and provide a reference list.

## Case 2

- Mia searched the Internet and found a useful diagram. She modified the diagram and included it in her assignment, but did not cite and reference the source.

## Case 3

- Nick handed in the same assignment for more than one subject/course.

## Case 4

- Xiaobo copied his assignment from a classmate's work, put his own name on it and submitted it to his teacher.

## Case 5

- Kit gave Suki his assignment and Suki copied it, put her own name on it, and submitted it to her teacher.

## Case 6

- Chloe and Eason worked on an individual assignment together. They each did a different part of the assignment. Then, they shared their work, put their own name on the assignment and individually submitted the work to their teacher.

## Case 7

- Ming and Doris discussed some ideas about how to do an individual assignment. Then, they completed the assignment on their own, without looking at each other's work. They put only their own name on their assignment and individually submitted their work to their teacher.

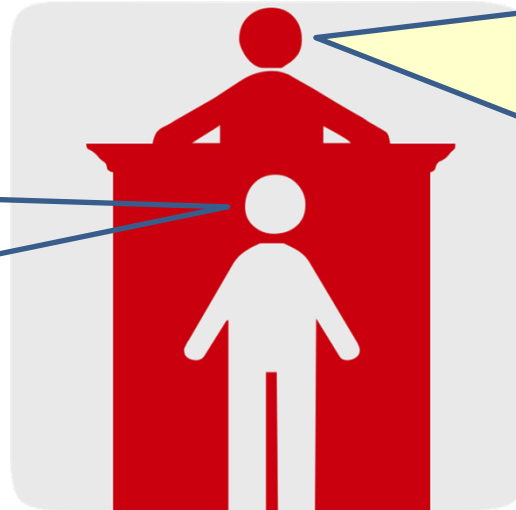


# Selected Useful Tips to follow Principles of Academic Honesty

[http://www6.cityu.edu.hk/ah/useful\\_tips.htm](http://www6.cityu.edu.hk/ah/useful_tips.htm)

- Start early and manage your time (Tip 1)
- Do your own work (Tip 7)
- Do not give a 'reference' copy of your work to someone (Tip 8)
- Ignorance is no excuse (Tip 11)

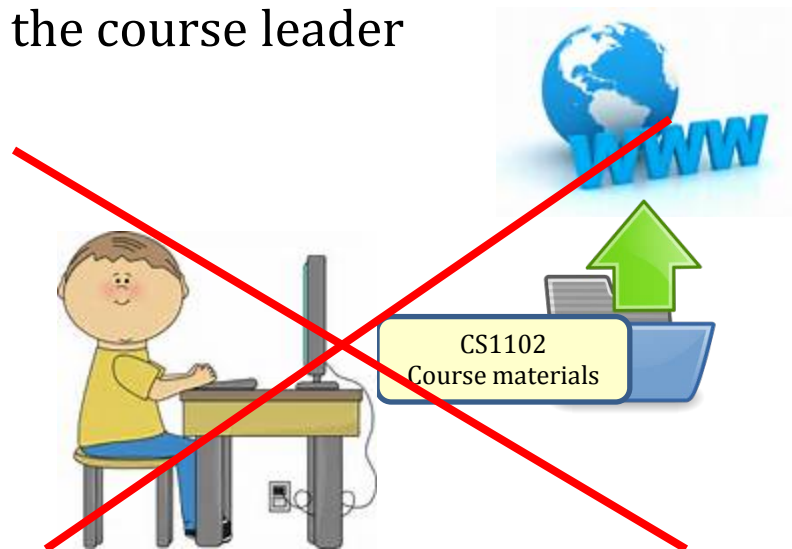
Your Honor, nobody has ever told me what I did was wrong. Also, I have seen others doing the same thing so I should not be guilty!



You are not a child any more and you have the intelligence to enter university so you should have known better what is right and wrong. Just because you see other people doing bad things does not provide justifications for you to do the same. I therefore find you guilty!

# DO NOT redistribute course materials

- You do not own the copyright of the course materials even though you can download them from Canvas course page
- So you SHOULD NOT redistribute any of the course materials to anyone else who are not taking this course, e.g., you SHOULD NOT upload any course materials to websites such as Course Hero
- If you are in doubt, first check with the course leader ([howard@cityu.edu.hk](mailto:howard@cityu.edu.hk))

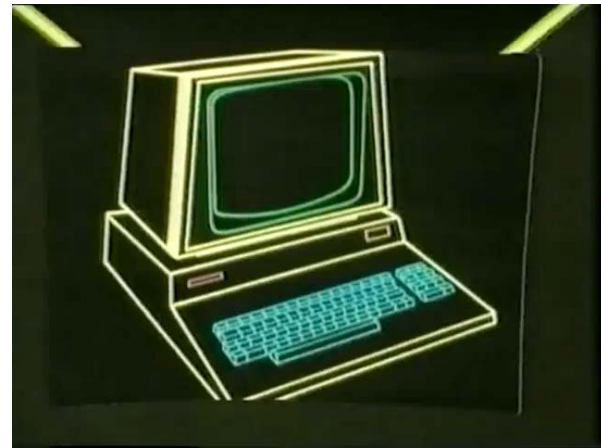


# Overview of Selected Lecture Topics



# Binary Number System

- Computers understand and process information in binary system



The Digital Computer (Bits and Bytes, Episode 1) – 2:45

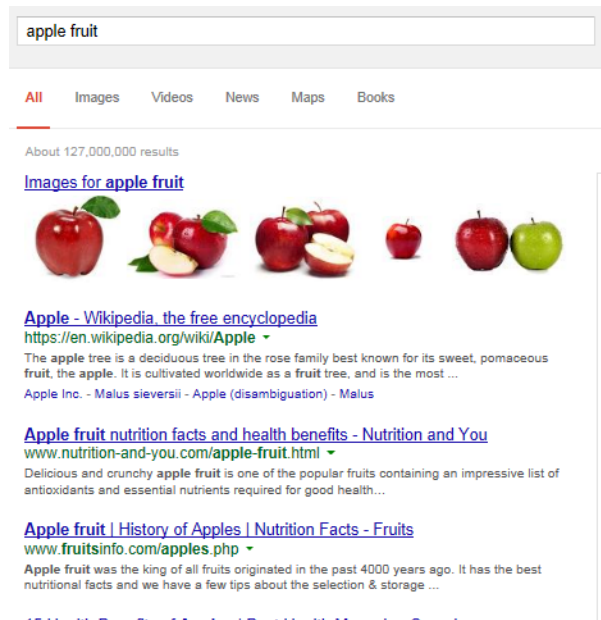


<https://www.youtube.com/watch?v=AdF2uk-EscE>

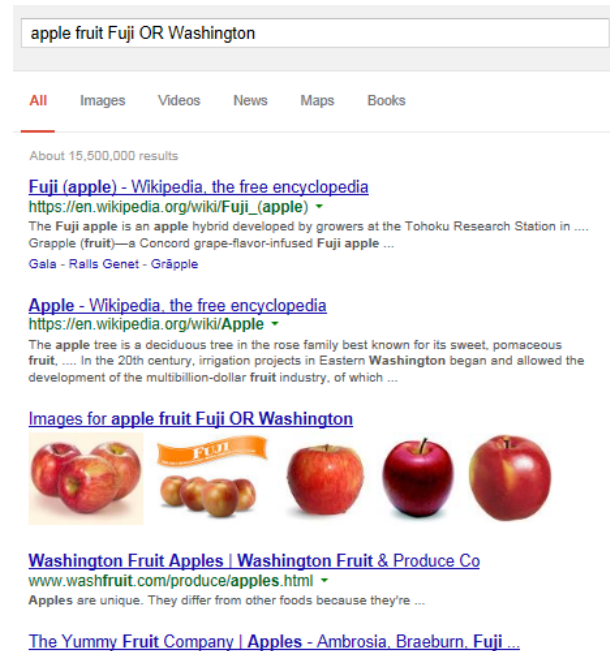
Classic Video from 1983

# Boolean Logic

- A form of algebra with operations to work with values that are either True or False, often denoted by 1 or 0 respectively



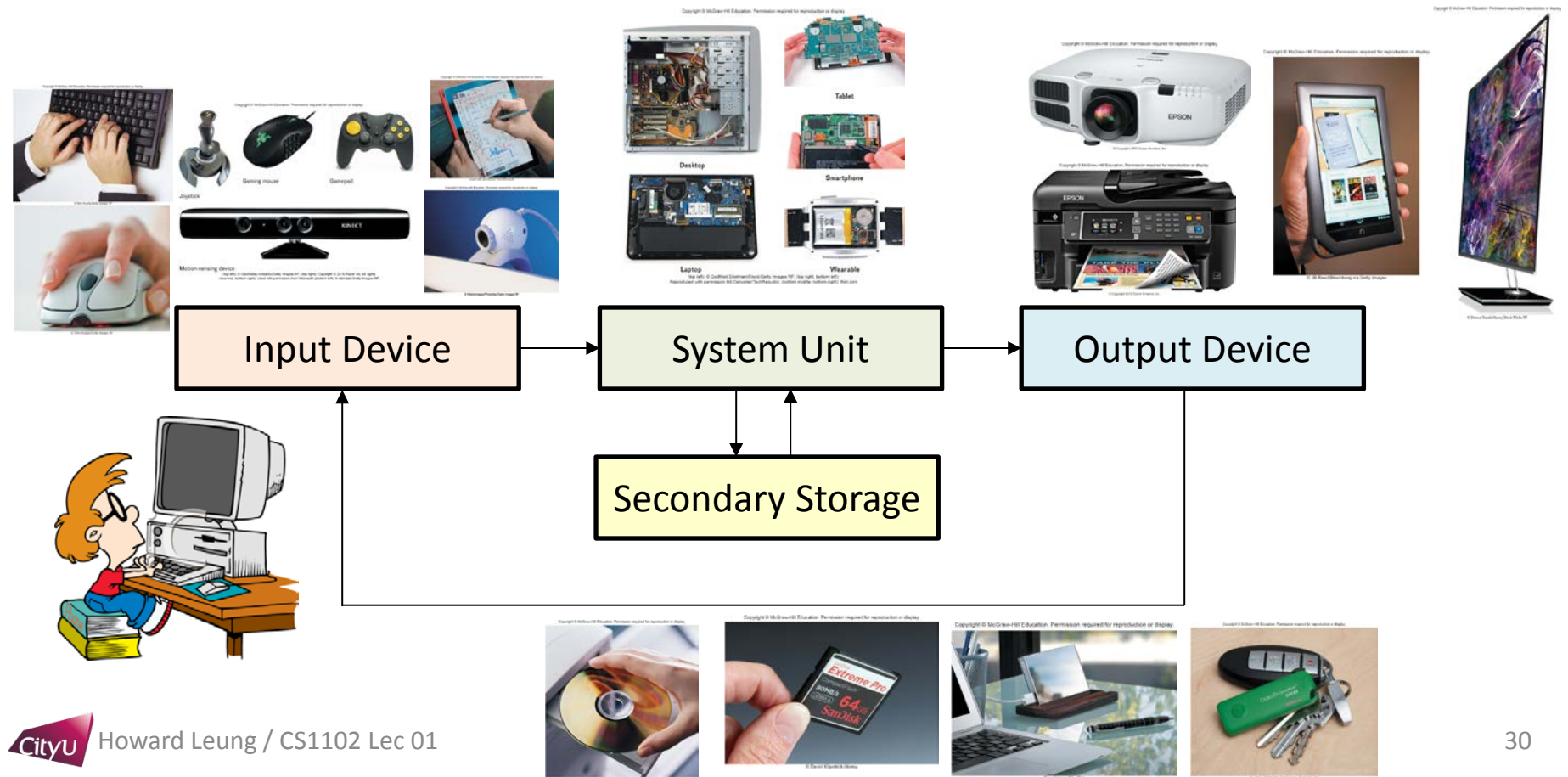
Searching webpages using the keywords  
"apple" AND "fruit"



Searching webpages using the keywords  
"apple" AND "fruit" AND ("Fuji" OR "Washington")

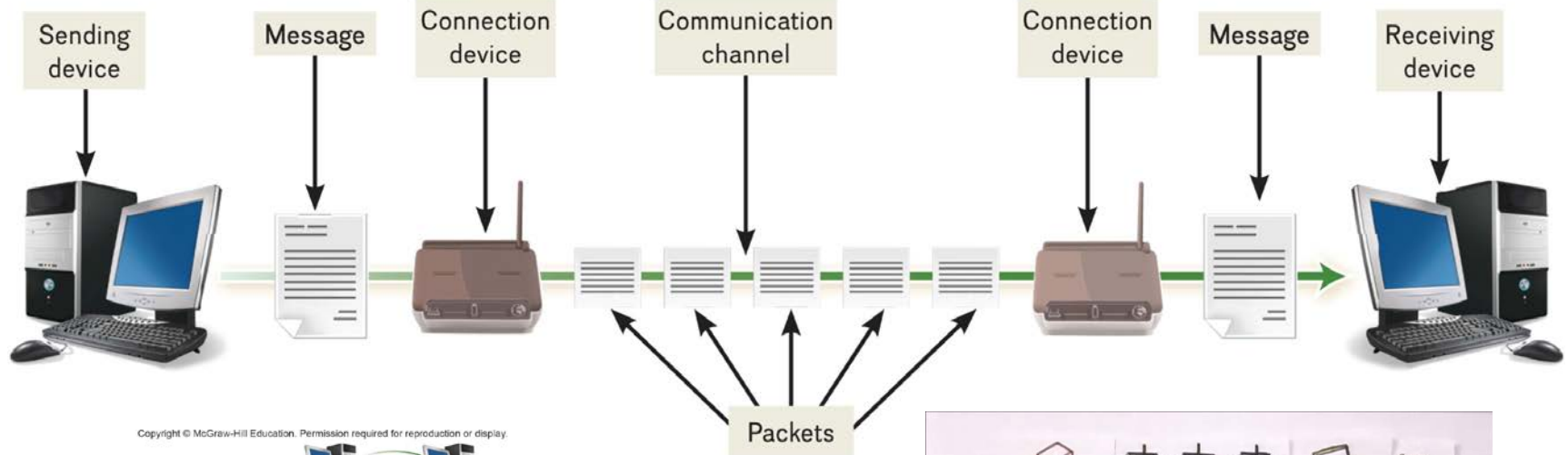
# Computer System

- Computers are electronic devices that can follow instructions to accept input, process data, and produce information

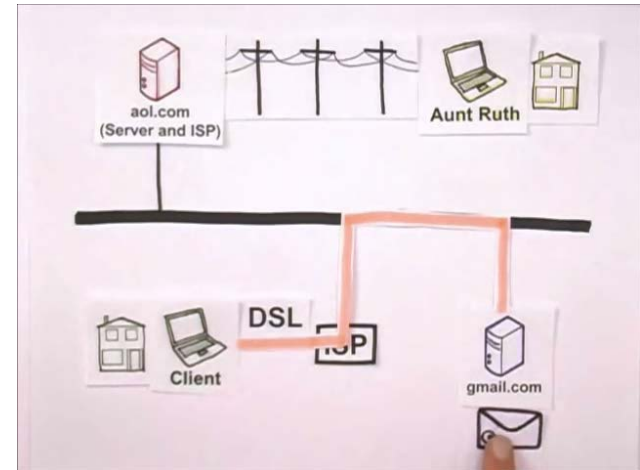
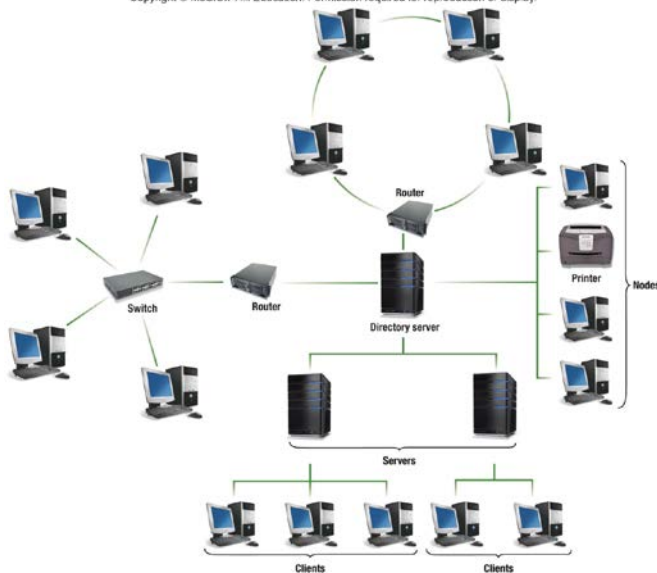


# Internet and WWW

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How the Internet Works in 5 Minutes – 2:27

[https://www.youtube.com/watch?v=7\\_LPdttKXPc](https://www.youtube.com/watch?v=7_LPdttKXPc)

# Computer Programming

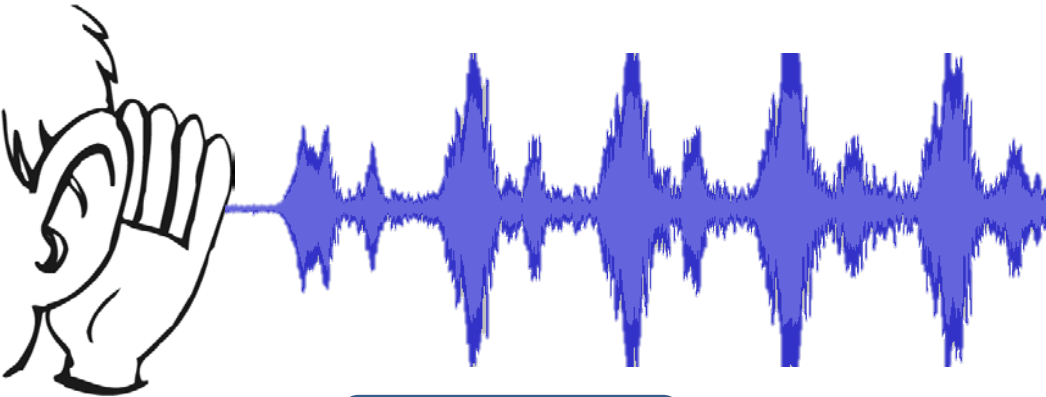
- A program is a list of instructions for the computer to follow to accomplish the task of processing data into information
- A programming language uses a collection of symbols, words, and phrases that instruct a computer to perform specific operations
- In this course, we will learn with
  - block-based programming (Scratch) which makes it easier for beginners to understand program logic without worrying about syntax
  - text-based programming (Javascript) which is closer to real-world programming



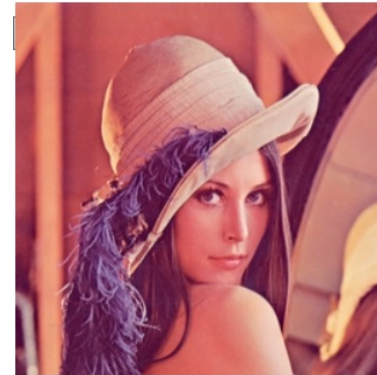
```
<> hello.html •
1  <!DOCTYPE html>
2  <html>
3    <head>
4      <meta charset="utf-8">
5      <title>Hello World</title>
6      <script>
7        function myclick() {
8          alert("Welcome to CS1102!");
9        }
10     </script>
11   </head>
12   <body>
13     <h1 onclick="myclick();">CS1102</h1>
14   </body>
15 </html>
```



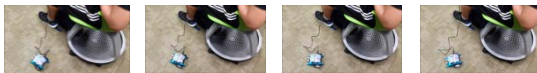
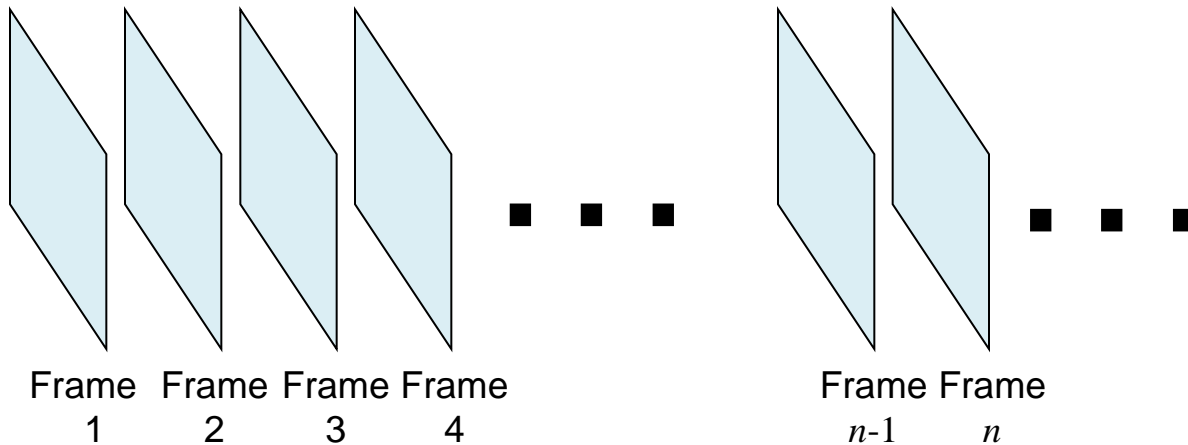
# Digital Media



Digital Audio



Digital Image



Digital Video

# Privacy, Security and Ethics

- Privacy concerns the collection and use of data about individuals
- Computer security focuses on protecting information, hardware, and software from unauthorized use as well as preventing damage from intrusions, sabotage, and natural disasters
- Computer ethics are guidelines for the morally acceptable use of computers in our society

News / Hong Kong / Law & Crime / TELEPHONE SCAMS

Taken for a ride: Three Hong Kong university students lose HK\$250,000 in telephone scams

PUBLISHED : Friday, 23 October, 2015, 7:00am  
UPDATED : Friday, 23 October, 2015, 7:00am

COMMENTS: 8



Clifford Lo

15 SHARES



Three university students, including two mainlanders, have become the latest victims of cross-border phone scams after they were duped out of HK\$250,000.

The 18-year-old Hong Kong girl and two mainlanders – a man, 22, and a woman, 21 – lodged complaints on Tuesday and Wednesday, according to police.

They separately received calls from someone claiming to be an employee of a postal organisation or courier company informing them that parcels they sent were carrying forged documents, police said.

**READ MORE:** [From street con-artists to phone fraud: A history of Hong Kong scams ... and how to avoid becoming another victim →](#)

# Green Computing

- We encourage students to practice green computing to save the environment
- For example, you can consider not printing out the lab instructions and just look at the pdf file on the computer



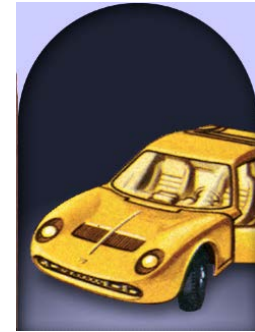
# Solving Problems with Programming



# What Can You Do with Programming?

- You are not in CS major, and you most likely would not work as a Software Engineer as your future career. Is there any situation in which you can write a program and make good use of it?
- Let's consider a game shown in the next slide

# Game



- You join a game show in which the host shows you 3 doors:



- There are 2 goats and 1 car behind these doors, with exactly one item behind each door
- Your objective is to open the door with the car behind it
- The host first asks you to first pick 1 door, which should remain closed
- The host (who knows what is behind each door) will then open 1 of the remaining 2 doors where there is a goat (which you can eliminate as it is a car)
- Now the host will ask you whether you want to open the door that you originally pick, or you want to switch to open the other door
- What is the probability that there is a car behind the door a) if you open the original door (no switch); and b) if you switch to open the other door?



# Example

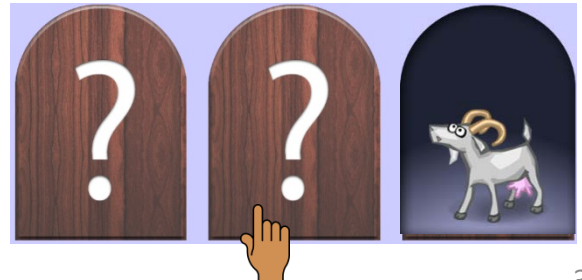
- Let's say that you pick the left door:



- The host will open 1 of the remaining 2 doors and show you the goat behind that opened door (say the right door):



- Now is it better for you to open the original door (left); or switch to open the other door (middle)?



# Finding the Solution

- You may try to work it out mathematically to find the solution, but it may not be intuitive for you to understand the answer
- You can write a program to simulate this situation. Then run many trials of your simulation to count how many times you get the car under each choice (no-switch vs switch). You can obtain the corresponding percentages which can be used as estimates for the probabilities of getting the car under each choice



# Life is about Making Choices

- In fact, if you can model a situation by quantifying it with various parameters, then you could write a program to run simulations in order to determine the potential outcome or identify the best option among a number of possible choices
- Programming may help you make smarter choices in your life!