



Computer Programing for Spatial Data



Overview

introduction

- This chapter introduces the basic concepts of computer, hardware, software, and programming, and sets up the context for GIS programming.

Computer Hardware and Software

- Computer Hardware
- Computer Software

(a)



(b)



FIGURE 1.1

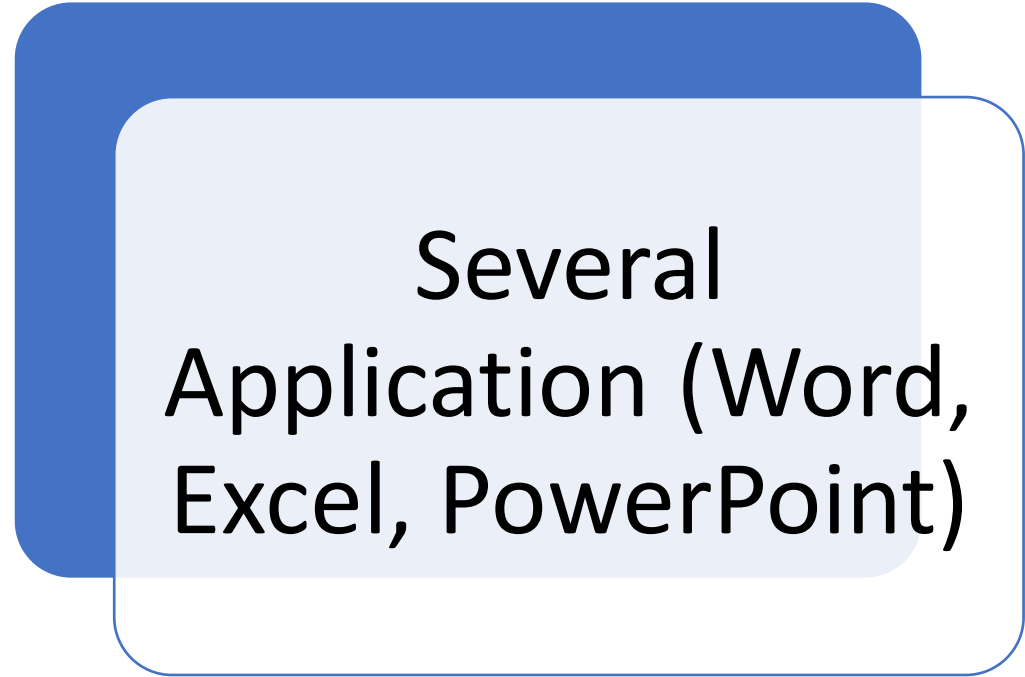
(a) NASA supercomputer. (From NASA supercomputer at <http://www.nas.nasa.gov/hecc/resources/pleiades.html>.) (b) Other computers: personal computer (PC), laptop, pad. (From different computers at <http://www.computerdoc.com.au/what-are-the-different-types-of-computers>.)



Software (Application) Freeware or requiring purchase



OS



Several
Application (Word,
Excel, PowerPoint)

GIS software

- *Geographic information system* (GIS) is one type of application software that deals primarily with geographic information (Longley et al. 2001).

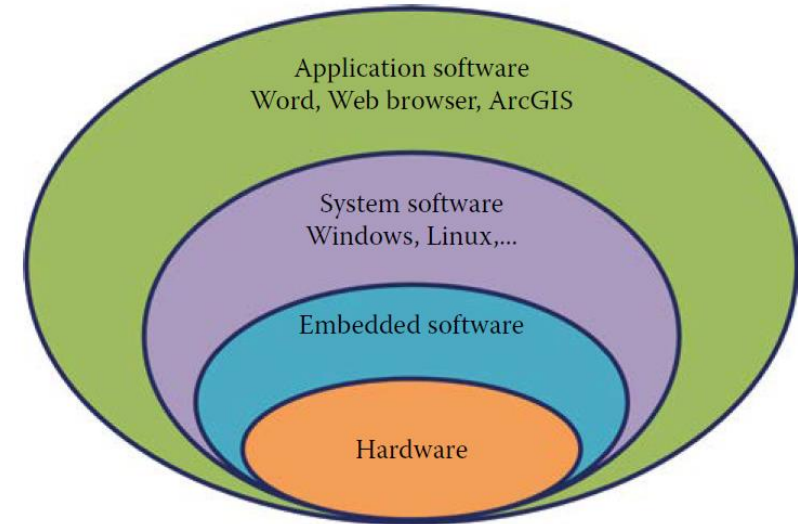


FIGURE 1.2
Different types of software.



GIS and Programming

- GIS originates from several domains and refers to the system designed to capture, observe, collect, store, and manage geographic data, and to provide tools for spatial analyses and visualization (Longley et al. 2001).
- The process of developing software is called programming. Programming instructs the computer to accomplish a task based on the orders. There are many different types of programming levels (Mitchell 1996).

Why do we need GIS programming?

Customizing	Customizing software for application:
Automating	Automating a process
Satisfying	Satisfying simple GIS need
Cultivating	Cultivating advanced GIS professionals

Python

It is excellent for programming beginners, yet superb for experts.

The syntax of Python is very simple and easy to learn. When you become familiar with them, you will feel that it is really very handy.

It is portable cross-platform. This means that a program written in Windows can be run using the Linux or Mac operating systems.

It is a fully object-oriented language, simple yet elegant, and stable and mature.

Class and Object

Class uses a set of attributes and behaviors to represent a category of real-world phenomena.

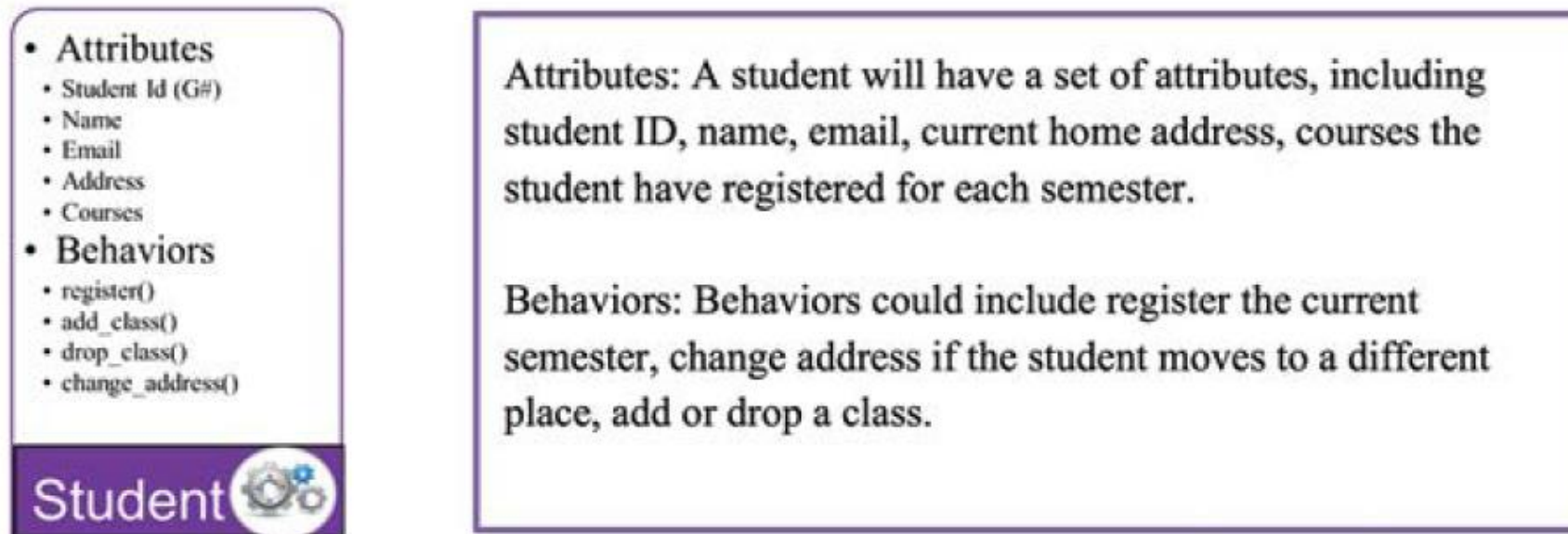


FIGURE 1.3

An example of representing students with the Student class.


Object

- An object is a specific instance of a class. We can consider objects as instances of classes by assigning values to their attributes.

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ลงชื่อเข้าใช้

ลืมรหัสผ่าน

หมายเหตุ

- นักศึกษา : ใช้รหัสนักศึกษาเป็นรหัสผู้ใช้งาน และ รหัสผ่าน (เฉพาะครั้งแรก)
- อาจารย์ : รหัสผู้ใช้งานและรหัสผ่านสำหรับอาจารย์ระบบสนับสนุนการปฏิบัติงาน การขอกู การบริการ (https://sos.ssrु.ac.th)

PHP 5
Picasa 3
PostGIS 2.1 bundle for PostgreSQL x64 9
PostGIS 2.2 bundle for PostgreSQL x64 9
Postgres Plus Add-ons
PostgreSQL 9.3
Protege_4.2_beta
Python 2.7
IDLE (Python GUI)
Module Docs
Python (command line)
Python Manuals
Uninstall Python
QGIS Essen
R
Robomongo 0.9.0-RC6
RStudio
R-Studio
Skype
SSH Secure Shell
Startup
TAP-Windows
TileMill-v0.10.1
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Weka 3.6.10
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Default Programs

Help and Support

Hands-On Experience with Python

reference