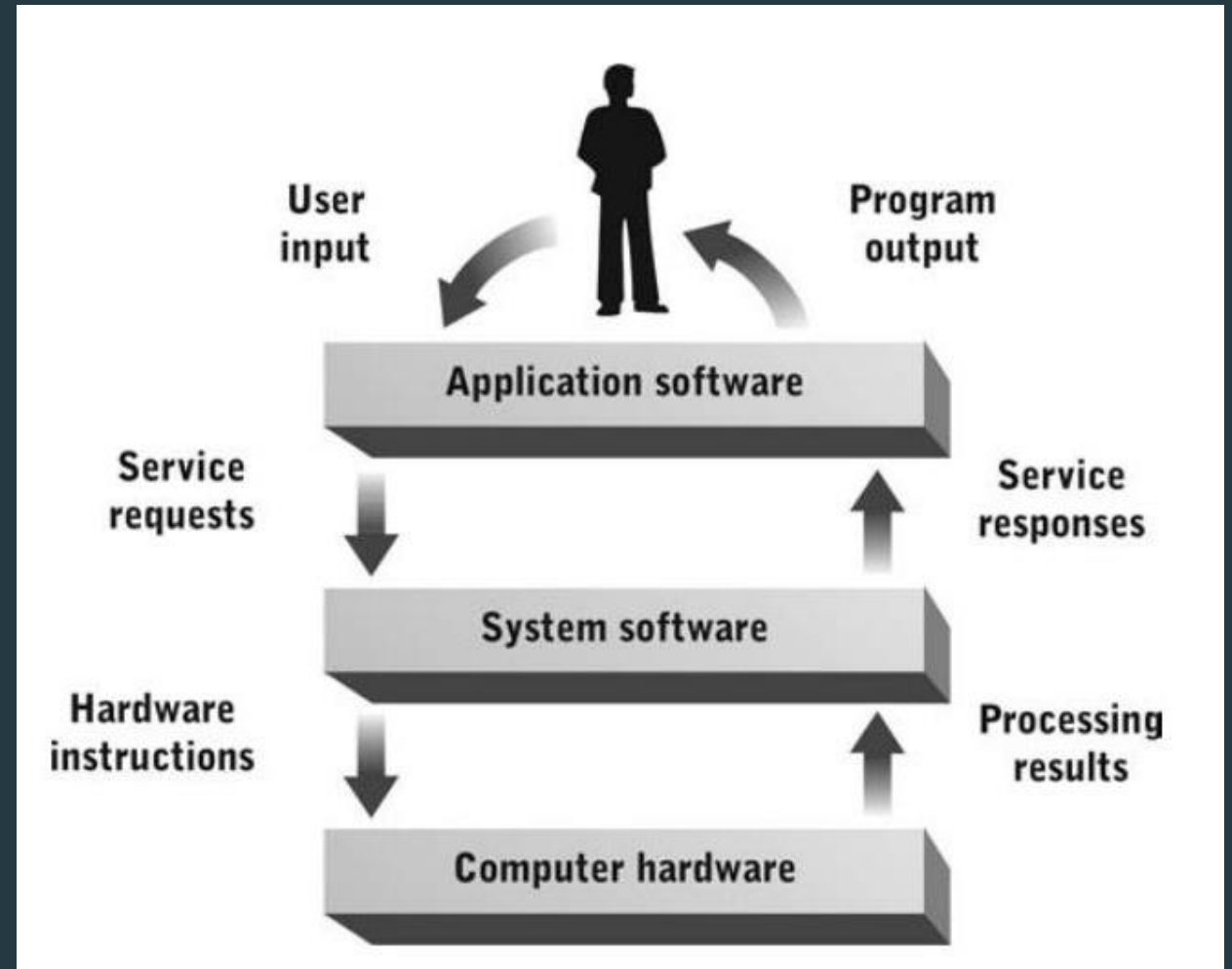




Computer Software (Applications)

Recall

- The **operating system** of a computer oversees all hardware resources and allocates them to users and applications as needed
- To perform various tasks, computer users interact with the various **application software** that call OS services request for computer resources

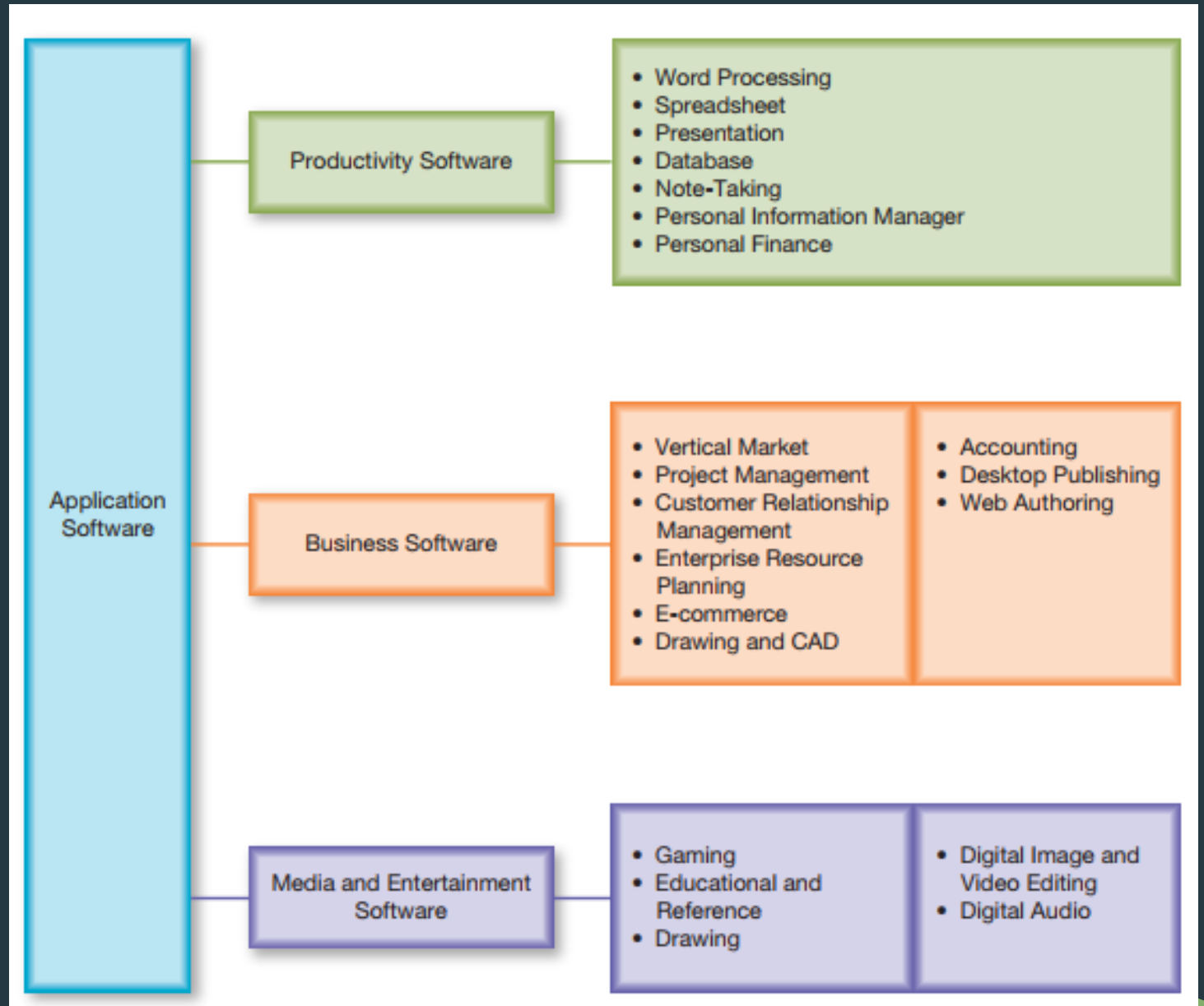


Application Software



Applications

- An **application**, or **app**, sometimes called application software, consists of programs designed to make users more productive, conduct business, or provide entertainment



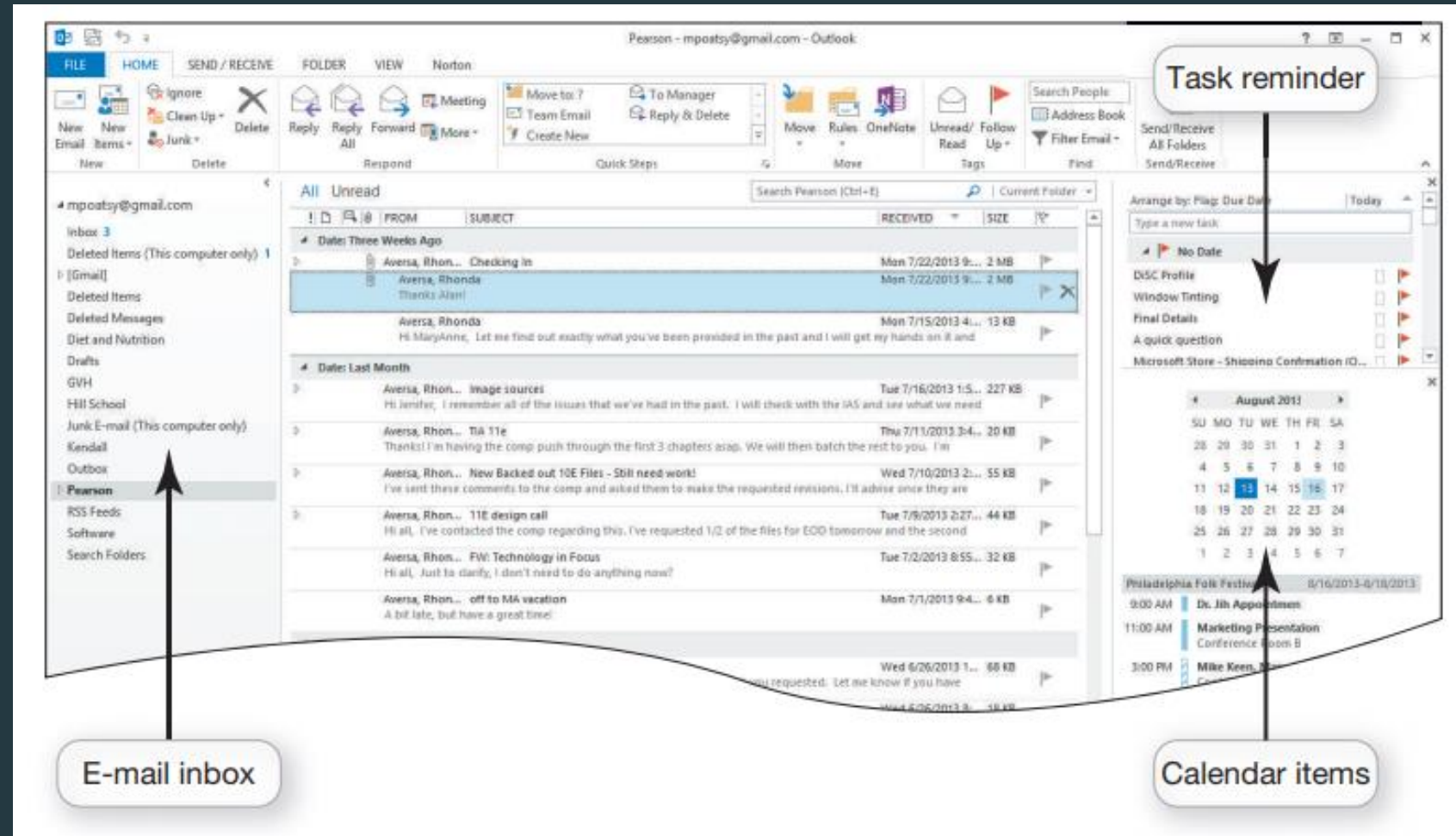
Productivity Software

- Productivity software includes programs that allow people to perform various tasks required at home, school, and business
- Examples:
 - **Word Processors** - Create and edit documents
 - **Spreadsheets** - Make calculations and perform numerical analyses
 - **Presentation Software** - Produce high-quality slide presentations
 - **Note-Taking Software** - take down and organize free-form notes

Productivity Software

- Examples:

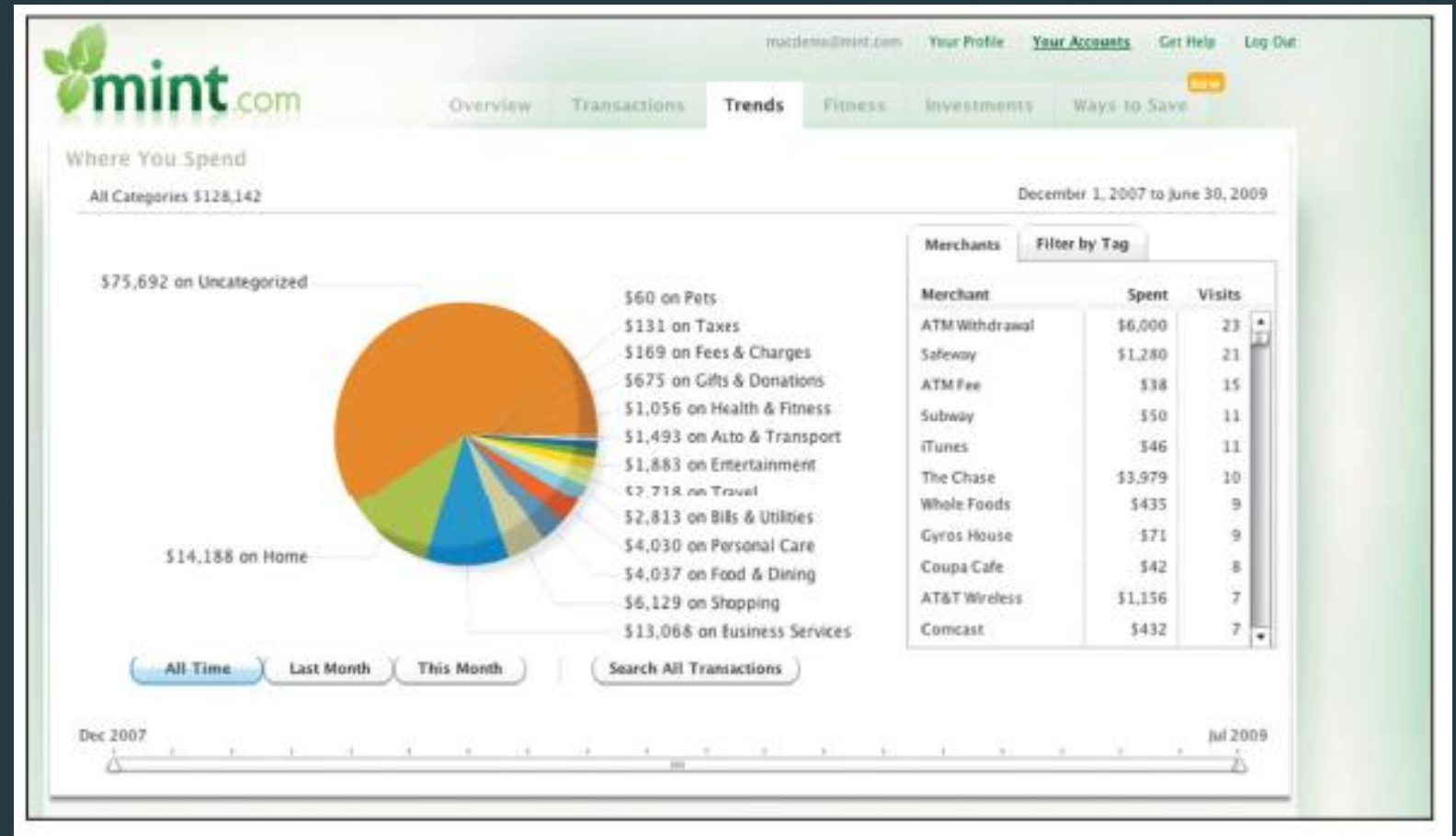
Personal Information Manager - Manage e-mail, contacts, calendars, and tasks in one place



Productivity Software

- Examples:

Personal Finance Software - Manage daily finances (e.g. automated bills payments, cash transfer, monitor budget, etc)



Productivity Software

- Examples:

Databases - Store and organize data, perform complex data querying

The diagram shows a table with 8 columns and 7 rows of data. Above the table, three callout boxes define key concepts:

- Field:** A data category (indicated by an orange arrow pointing to the 'ID' column).
- Record:** A group of related fields (indicated by a blue arrow pointing to the second row).
- Table:** A group of related records (indicated by a green arrow pointing to the entire table).

ID	FirstName	LastName	Company	Street	City	State	ZipCode
1	Susan	Scantosi	eWidget Plus	363 Rogue Street	St. Louis	MO	63136
2	Thomas	Mazeman	BooksRUs	2165 Piscotti Avenue	Springfield	IL	62702
3	Douglas	Seaver	Printing Solutions	7700 First Avenue	Topeka	KS	66603
4	Amir	Raviv	TechStands	1436 Riverfront Road	St. Louis	MO	63136
5	Franklin	Scott	WorksSuite	8789 Ploughman Ave	Tulsa	OK	74101
6	Ronald	Komeika	Creekside Financial	1264 Pond Hill Road	Toledo	OH	43601
7	Barbara	Mitchell	Market Tenders	9823 Bridge Street	La Porte	IN	46350

Productivity Software

For proprietary software, it's cheaper to buy a **software suite** than to buy each program individually.

Productivity software suites include:







- *Microsoft Office*: the standard proprietary software suite for Windows. A version is also available for Apple computers.
- *Apache OpenOffice*: an open source productivity suite that provides functionality similar to that of Microsoft Office
- *Apple iWork*: a productivity suite made especially for Apple computers

Business Software

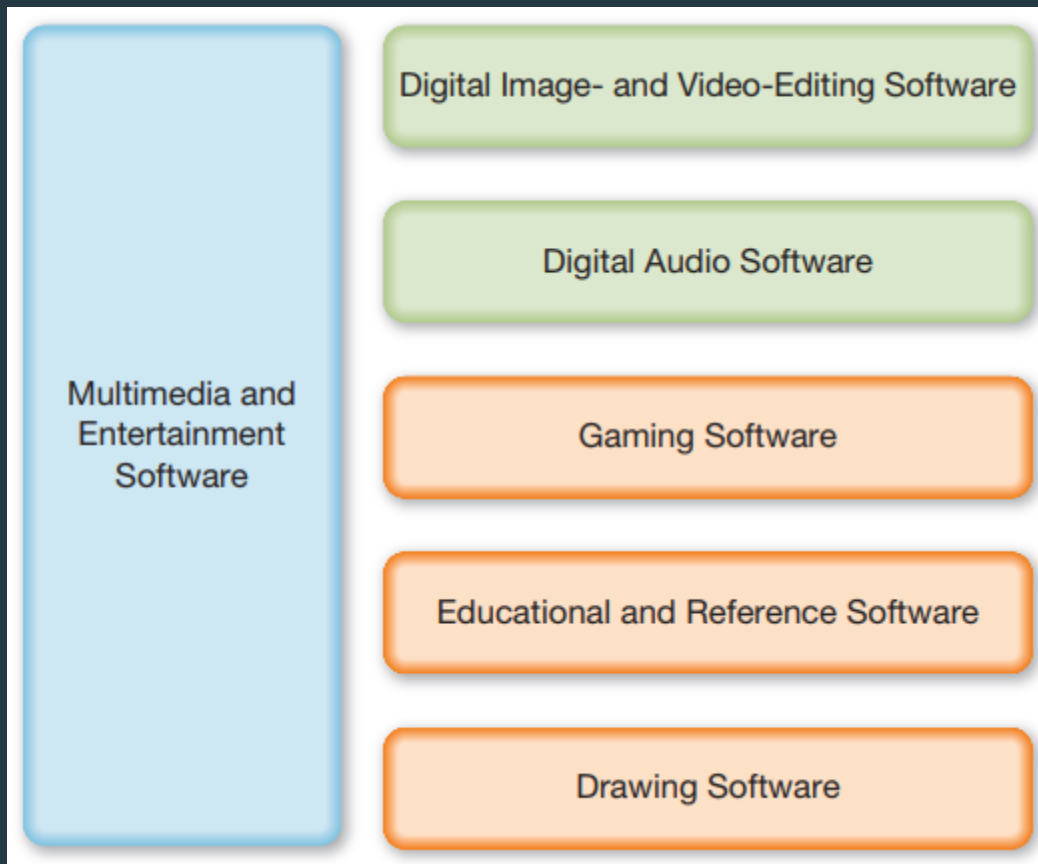
- Business software assist users with day-to-day business operational tasks or enable them to provide services to customers
- Software for small businesses
 - **Accounting software** help business owners manage finances by providing tools for tracking accounts receivable and accounts payable, inventory management, payroll, and billing tools. Examples: Intuit QuickBooks and Sage Peachtree
 - **Desktop publishing (DTP)** software provide tools to prepare and design newsletters, catalogs, annual reports, or other large, complicated publications. Examples: Adobe InDesign
 - **Webpage Authoring** software provide wizards, templates, and reference material to design interactive web pages. Examples: Adobe Dreamweaver

Business Software

- Software for large and specialized businesses

PROJECT MANAGEMENT	CUSTOMER RELATIONSHIP MANAGEMENT (CRM)	ENTERPRISE RESOURCE PLANNING (ERP)
 <p>Creates scheduling charts to plan and track specific tasks and to coordinate resources</p>	 <p>Stores sales and client contact information in one central database</p>	 <p>Controls many “back office” operations and processing functions such as billing, production, inventory management, and human resources management</p>
E-COMMERCE	COMPUTER-AIDED DESIGN (CAD)	VERTICAL MARKET
 <p>Facilitates website creation and hosting services, shopping cart setup, and credit card-processing services</p>	 <p>Creates automated designs, technical drawings, and 3-D model visualizations for architecture, automotive, aerospace, and medical engineering industries</p>	 <p>Addresses the needs of businesses in a specific industry or market such as the real estate, banking, and automotive industries</p>

Media and Entertainment Software



- Media software are specialty software required to produce computer games, graphic designs, animations, music and videos

Media and Entertainment Software

Image Editing Software

- Commonly provide 1 or more of the following tools to create or manipulate images
 - Modifications to digital photos (e.g. red-eye removal; modifying contrast, sharpness)
 - Painting tools (e.g. brushes, pens, and artistic media)
 - Special effects for **image processing** (image filters, removing background, face swaps)
- Examples: Gimp, Adobe Photoshop, Corel Paintshop

Video Editing Software

- Provide means to edit and refine videos and commonly feature the following core features
 - Video splicing, splitting and trimming
 - Encoding and compression of video using different formats
 - Special effects
 - Add voiceovers and BGM
 - Adding transition effects and text
- Examples: iMovie, Adobe Premiere, PowerDirector

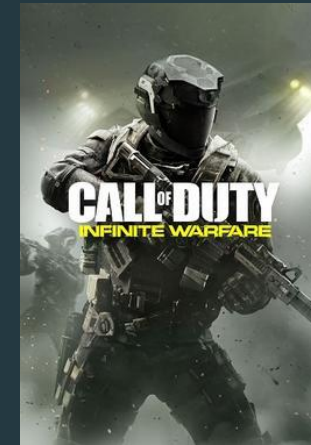
Media and Entertainment Software

- **Audio editing software** provide tools to edit or produce audio files
- The following are common features
 - Basic editing - mixing tracks, cutting dead air, splicing audio
 - Audio processing effects - enhancing bass/ treble, removing vocals, removing background noise
 - Convert audio files to different uncompressed (e.g. WAV) or compressed formats (e.g. MP3, AAC)
 - Compose soundtracks with virtual instruments, voice recorders, synthesizers, and special audio effects
- Examples: Audacity, MAGIX Music Maker



Media and Entertainment Software

- **Computer games** provide entertainment with a wide variety of game genres such as:
 - Real-time strategy (RTS)
 - First Person / Third Person Shooters (FPS / TPS)
 - Multiplayer Online Battle Arenas (MOBA)
 - Role-playing (RPG)
 - Simulation
 - Sports
 - Puzzles and party games
 - Action Adventure



Media and Entertainment Software

- **Educational software** provide users with a means to access learning material or learn new skills.
 - **Course management** software provide a platform to deliver online learning materials and manage online classes
 - **Simulation programs** *mimic* the behavior of real world objects or events to allow users to experience them in a controlled environment
 - **Emulator programs** *duplicate* the hardware and OS features of a real device and are commonly used to run software outside its native computer platform

```
each: function(e, t, n) {
  var r, i = 0,
      o = e.length,
      a = M(e);
  if (n) {
    if (a) {
      for (; o > i; i++)
        if (r = t.apply(e[i], n), r !== !1) break;
    } else
      for (i in e)
        if (r = t.apply(e[i], n), r !== !1) break;
  } else if (a) {
    for (; o > i; i++)
      if (r = t.call(e[i], i, e[i]), r !== !1) break;
  } else
    for (i in e)
      if (r = t.call(e[i], i, e[i]), r !== !1) break;
  return e
},
trim: b && !b.call("\uffff\u00a0") ? function(e) {
  return null == e ? "" : b.call(e)
} : function(e) {
  return null == e ? "" : (e + "").replace(C, "")
},
makeArray: function(e, t) {
  var n = t || [];
  return null != e && (M(Object(e)) ? x.merge(n, "string" == typeof
),
inArray: function(e, t, n) {
  var r;
  if (t) {
    if (m) return m.call(t, e, n);
    for (r = t.length, n = n ? 0 > n ? Math.max(0, r + n) : n : 0;
      if (n in t && t[n] === e) return n
  }
}
```

Software Development Tools

Development Tools

- **Development Tools** are specialized software that are used to create software programs.
- They perform the following functions:
 - Provide an environment for programmers to write and manage their source code
 - Convert source code into a machine-executable instructions

Translators

- To run programs written in high-level source code, they must be converted into instructions that a CPU understands – aka. **Machine code** or **object code** using a **translator**
- Types of translators:

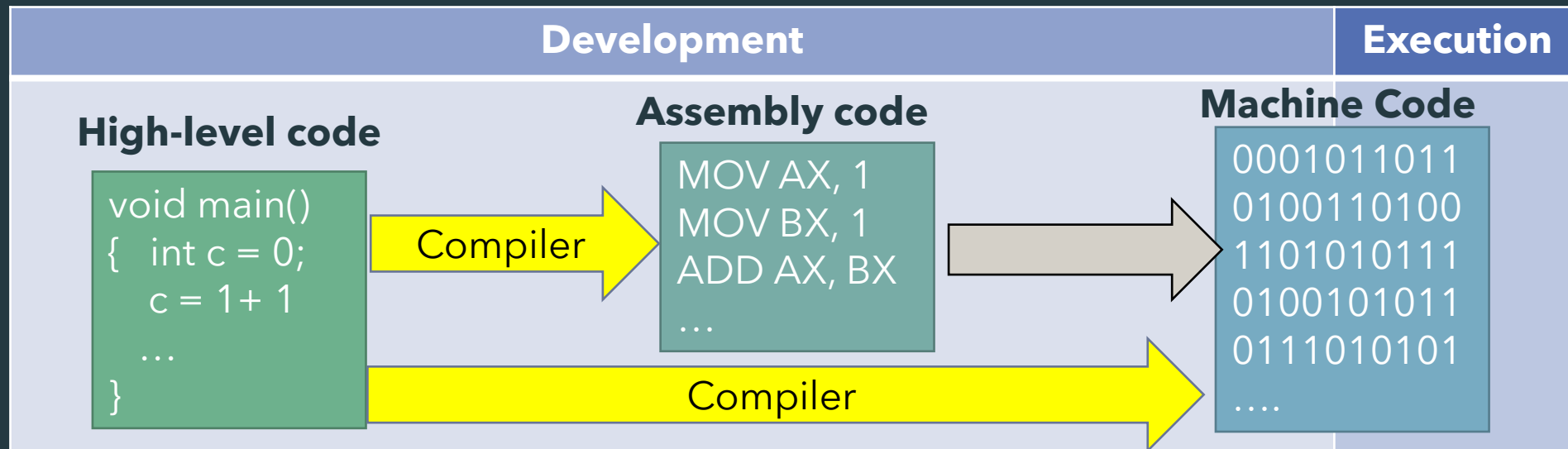
Compiler

Assembler

Interpreter

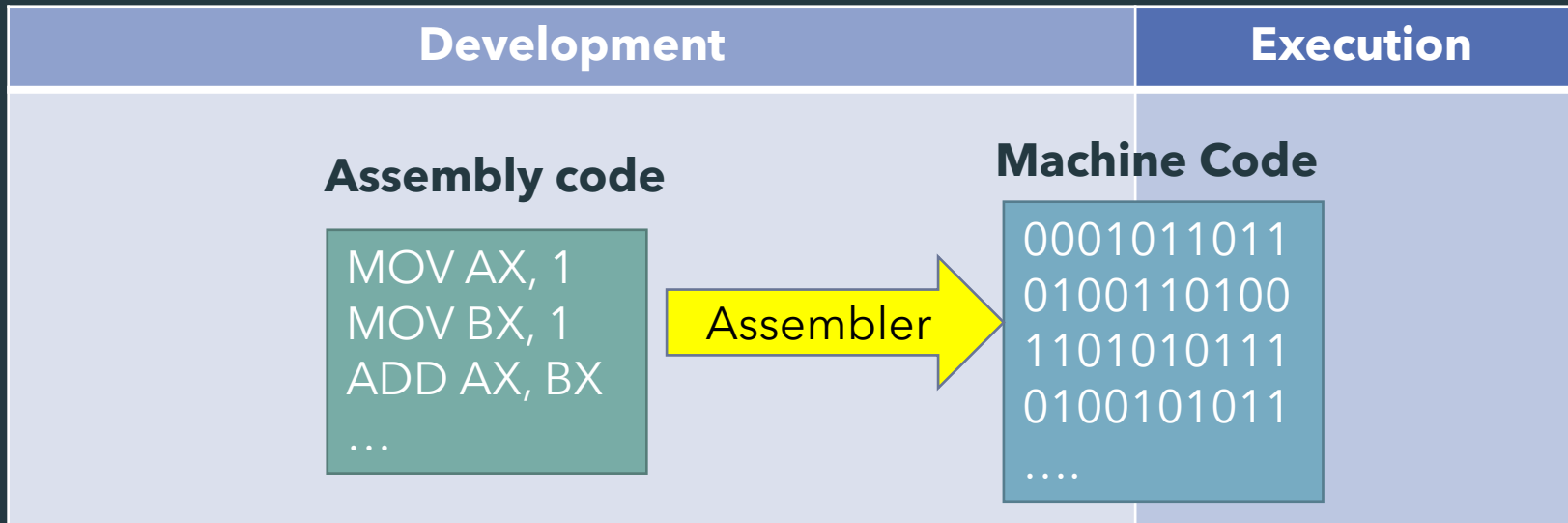
Compilers

- **Compilers** translate high level code into intermediate assembly code or directly into machine code to produce an executable file before a program is run



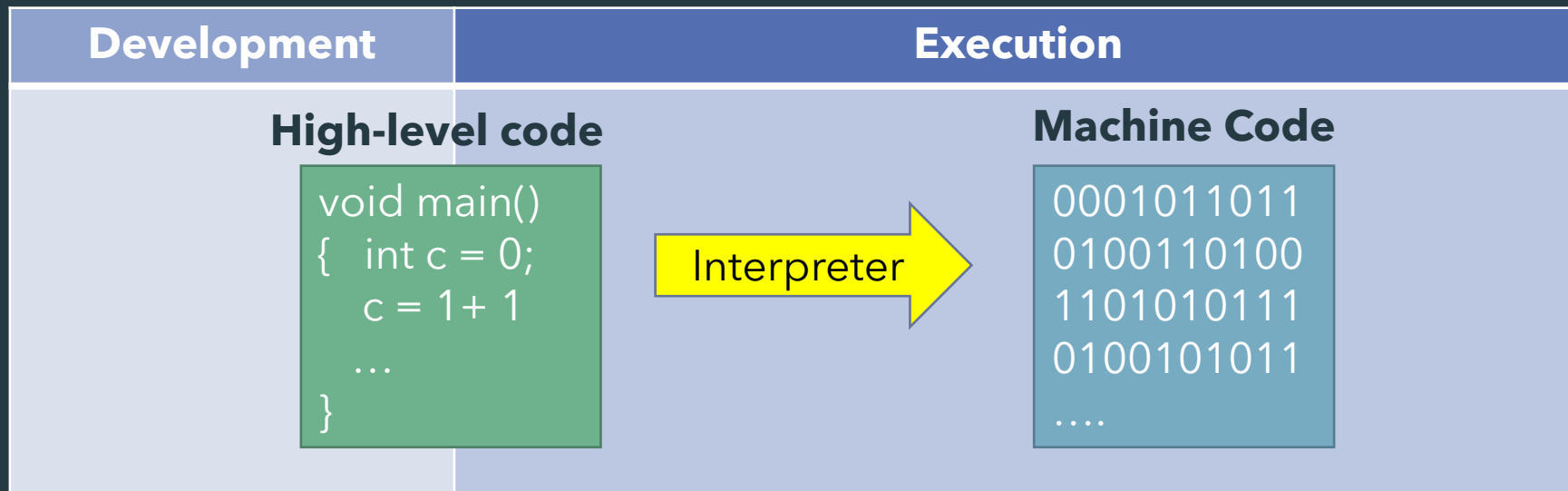
Assemblers

- **Assemblers** translate assembly code into machine code to produce an executable file before a program is run
- Using an assembler also produces an executable file from the code



Interpreters

- **Interpreters** translate high level code one line at a time into machine code as the program is being run.



Integrated Development Environments

- An **integrated development environment (IDE)** provides a collection of software development tools to programmers
- Includes:
 - Source code editor
 - Program build automation tools
 - Debuggers
 - Code Version Control
- Examples: DevC++, Eclipse IDE, NetBeans, VSCode

Acquiring Software



Software Licenses

- Using software requires one to acquire its **license** and abide by its **end-user license agreement (EULA)**
- When purchasing software, you're actually paying for the license to use it
- Types of licenses

	Proprietary	Shareware/ Freeware	Open Source ("Copyleft")	Public Domain
Copyright retained by publisher	Yes	Yes	Yes	No
Can acquire copy of code	No	No	Yes	Yes
Can modify the software	No	No	Yes	Yes
Can freely copy	No	Usually yes	Yes	Yes
Can freely distribute	No	Usually yes	Under same license	Yes

Software Installation

- Most software executables require **installation** before they can run on a computer.
- Installing involves checking for system compatibility, unpacking software components, copying these components into appropriate folders, and storing user and computer settings needed to run the software correctly
- When installing software, a user is often given the option for
 - **Full installation** (a.k.a. *typical installation*) copies all commonly used files and programs from the distribution package to your computer and uses the default settings of the software
 - **Custom installation** allows a user to select only which components to install and to customize software settings.

Web Software

- **Web-based applications** are those that are hosted online by the vendor and are commonly accessible through a browser without requiring separate installation
 - Examples: Google Docs, Canvas, Dropbox
- This distribution model is also called **Software as a Service (SaaS)**
- Web-based application may be offered free-of-charge or through a subscription-based payment scheme
- Key advantage of SaaS is accessibility and compatibility across a wide range of hardware platforms

Software Piracy

- **Software piracy** refers to unauthorized copying, distribution and use of software
- What constitutes piracy?
 - Distributing copies of proprietary software to others
 - 'Cracking' software that would have been otherwise been protected from illegal use
 - Using more copies of legitimately acquired software than what its EULA permits

Software Piracy Consequences

- Exposure to viruses, corrupt disk or defective software
- Inadequate or no product documentation
- No warranties
- Lack of technical support
- Ineligibility for software upgrades offered for licensed users.
- Legal fines:
 - Violation of IP Code of the Philippines RA 8293
 - Violation of Optical Media Act RA 9239

Software Piracy and Ethics

- Piracy is an ethical issue:
 - Loss of income and jobs for the software industry
 - Leads to higher costs that legitimate users need to bear

Region	Country	Piracy Rates	Piracy Losses (\$M)
Asia Pacific	China	92%	\$3,823
	Vietnam	92%	\$41
	Indonesia	88%	\$157
	Pakistan	83%	\$16
	Thailand	80%	\$141
	Other AP	76%	\$37
	India	73%	\$367
	Philippines	72%	\$55
	Malaysia	63%	\$129
	Hong Kong	52%	\$102
	Korea	48%	\$462
	Singapore	43%	\$90
	Taiwan	43%	\$139
	Australia	31%	\$341
	Japan	29%	\$1,633
	New Zealand	23%	\$21
Regional Average/Total		53%	\$7,553

Summary

- **Application software** is the software for everyday tasks at home, school, and work. Application software includes the following:
 - Productivity software, such as word processing, finance, and personal information management programs
 - Business software for small and large businesses
 - Multimedia software, such as applications used for image and video editing, recording and editing digital audio, and gaming software
 - Educational and reference software such as simulators and course management software

Summary

- **Software development tools** are specialized software that are used to create software programs. They include
 - Translators such as compilers, assemblers and interpreters
 - Integrated development environments
- To use software, one must have a legal **license** and agree to its **EULA**
- **Installation** is the process of preparing a software for usage on a computer system
- **Software as a Service** provides software that is hosted online accessible through a browser without requiring installation

Summary

- **Software piracy** is the unauthorized copying, distribution and use of software. It placed users at risk and also negatively impacts the software development industry