Chpt\_1\_ chkpt && RQ

1. Computer used by so many different people, in so many different profession:

Because the computer can be programmed to do so many different tasks

1. 5 major hardware components of a computer system

CPU

RAM

Secondary storage devices

Input devices

Output devices

1. CPU have two units: control unit ALU – arithmetic and logic unit
2. Describe steps of fetch/decode/execute cycle:

Fetch: CPU control unit fetches from main memory, the next instruction in the sequence of program instructions

Decode: the instruction is encoded in the form of a number

The control unit decodes the instruction and generates an electronic signal

Execute: The signal is routed to the appropriate component of the computer

Such As: ALU disk drive some other device

The signal causes the component to perform an operation

1. Memory address: a unique number assigned to each storage location in memory

Purpose: to allow data stored in RAM to be located

1. main memory: program instruction and data are stored in main memory while program

is running

is volatile: loses its contents when power is removed from computer

secondary storage: hold data for long period of time

even when there is no power to the computer

1. Two category of software: operating systems and application software
2. Fundamental set of programs controls the internal operations of computer’s hardware:

The operating system

1. A program that performs a specialized task: virus scanner, a file-compression program, data-backup program: A utility program
2. Word processing program, spreadsheet program, e-mail programs, web browsers, game programs: category of software: application software application programs
3. Algorithm: A set of well-defined steps for performing a task or solving a problem
4. Computer programming language: To ease the task of programming

Programs may be written in a programming language, then converted to machine language

1. High-level language: is closer to level of human readability and resembles natural languages

Low-level language: is close to the level of the computer and resembles the system’s numeric machine language

1. Portability: A program may be written on one type of computer and run on another type
2. Preprocessor: Reads the source file, searching for commands that begin with the # symbol

These are commands that cause the preprocessor to modify the source file in some way

Compiler: translates each source code instruction into the appropriate machine language instruction into the appropriate machine language instruction and creates an object file

Linker: combines the object files with necessary library routines to create an executable file

1. Stored in a Source file: contains program statements written by the programmer

Object file: contains machine language instructions generated by the compiler

Executable file: contains code ready to run on the computer

Includes the machine language from an object file and the necessary

code from library routines

1. Integrated development environment: includes a text editor

Compiler

Debugger

Other utilities

Integrated into one packages

1. Key word: special purpose defined as part of a programming language

Programmer-defined symbol: is a word or name defined by the programmer

1. Operators: perform operations on one or more operands

Punctuation symbols: mark the beginning

or ending of a statement

or separate items in a list

1. Program line: a line is a single line as it appears in the body of a program

Statement: is a complete instruction that causes the computer to perform an action

It may be written on 1 or more lines

1. Variables: because their contents may be changed while the program is running
2. Variable current contents when new value is stored there:

it is overwritten by the new value the old value is “lost”

1. In Program before a variable is used: must be defined in a declaration
2. Three primary activities of a program: input processing output
3. Four items should identify when defining what a program is to do:

Purpose

Information to be input

Processing to take place

Desired output

1. Visualize a program running: to imagine what the computer screen looks like while the program is running

Value of doing this: helps define input and output

1. Hierarchy chart: A chart that depicts the logical steps of the program in a hierarchical fashion
2. Pseudocode: A “language” that is a cross between human language and programming languages that is used to express algorithms

1. Difference between high level pseudocode: just lists the steps a program must carry out

Detailed pseudocode: shows the variables

Logic

Computations

Needed to create the program

1. Compiler does with a program source code:

It translates each source code statement into the appropriate machine language

That is used to express algorithms

1. Logic error: a mistake that causes a program to produce erroneous results

A logic error occurs when what the programmer means for the program to do does not match what the code actually instructs the program to do

1. Run-time error: An error that occurs while the program is running when the system is asked to perform an action it cannot carry out
2. Process of desk-checking: The programmer steps through each statement in the program from the beginning to end

The contents of variables are recorded

The screen output is sketched

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RQ

1. Computers can do many different jobs because they can be ---programmed ---
2. ---
3. Internally, the CPU consists of the ---ALU arithmetic logic unit ---

and the --- control unit ---

1. ---
2. The two general categories of software are ----operating system ---

and --- application software ----

1. ---
2. Since computers can’t be programmed in natural human language

Algorithms must be in a ---programming --- language

1. ---
2. ---High-level --- languages are close to the level of humans in terms of readability
3. ---
4. A program’s ability to run on several different types of computer systems is called

---portability ---

1. ---
2. Words or names defined by the programmer are called

--- programmer-defined symbols ---

1. ----
2. --- Punctuation --- characters or symbols that perform operations on one or more operands
3. ---
4. A --- variable --- is a named storage location
5. ---
6. Three primary activities of a program are:

--- input--- ---processing --- ---output ---

1. ---
2. --- Output --- is information a program sends to the outside world
3. ----
4. Both main memory and secondary storage are types of memory: difference:

Main memory --- RAM is volatile

--- which means its contents are erased when power is removed

From the computer

Secondary memory--- disk or CD

--- does not lose its contents when power is removed from the computer

1. ---
2. A syntax error: is the misuse of A key word

A operator

A punctuation

Or other part of the programming language

A logical error: is a mistake that tells the computer

to carry out a task incorrectly

or to carry out tasks in the wrong order

Causes the program to produce the wrong results

1. ---
2. Pseudo code: Balance----

User input starting balance

User input total deposits

User input total withdrawals

Calculate current balance

Display current balance

Detailed code: Balance---

Input startBalance

Input totalDeposits

Input totalWithdrawals

currentBalance = startBalance + totalDeposits - totalWithdrawals

1. ---
2. 45
3. ---
4. j =10

k =2

l =4

j = k\*j = 10\*2 =20

l = k\*l = 2\*4 =8

k = j+l = 20+8 = 28

28

1. ---
2. Error: the calculation has to be after user entered value for variables of width and length