
Overview of Computers

Instructor – Dr. Shiv Ram Dubey

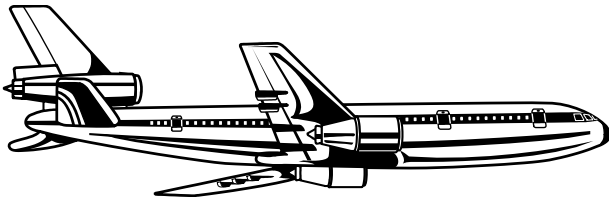
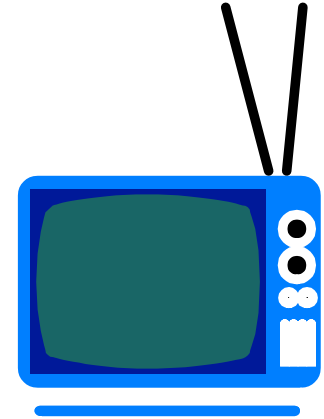
Computer Basics

Assumes no knowledge of
computers

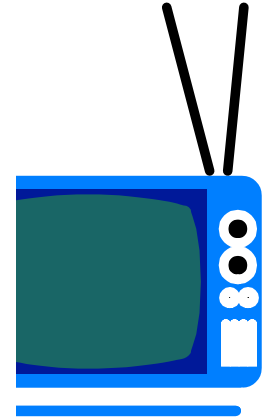
what ultimately matters in this course is not so much where you end up relative to your classmates but where you, in Week 13, end up relative to yourself in Week 0

What is a computer?

Which one is the computer?



Which one is the computer?



Is a rock a computer?



Is a rock a computer?



Does not act or process
No input & no output

Is a rock a computer?



Does not act or process
No input & no output

Computers - handle *input* and *output*

Is washing machine a computer?



Input: dirty clothes

Output: clean clothes

Is washing machine a computer?



Input: dirty clothes

Output: clean clothes

Does not handle
information

Is washing machine a computer?



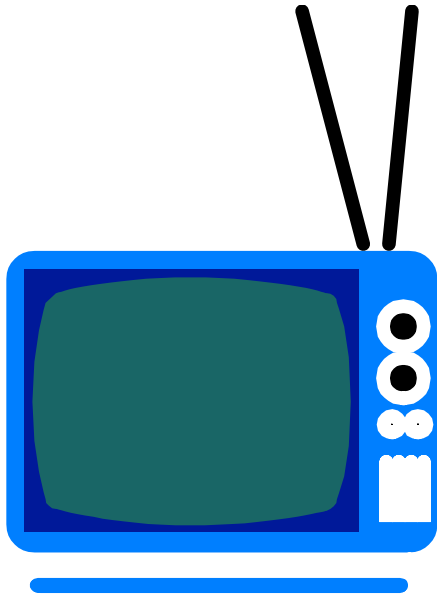
Input: dirty clothes

Output: clean clothes

Does not handle
information

Computers - input and output *information*

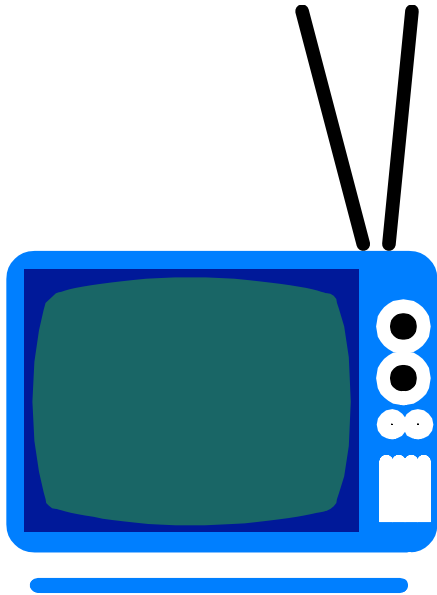
Is a television set a computer?



Input: information from cables or radio waves

Output: information as sound and picture

Is a television set a computer?

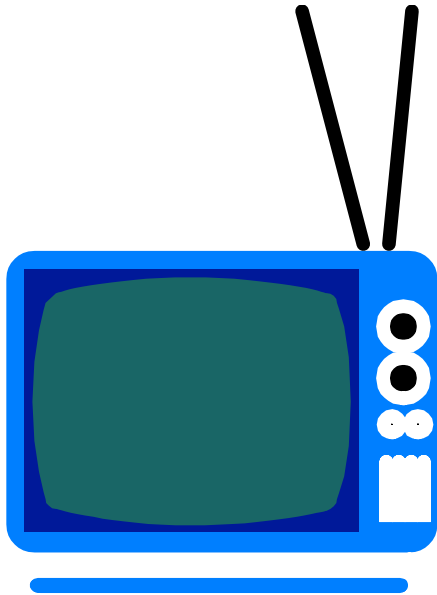


Input: information from cables or radio waves

Output: information as sound and picture

Does not process information by computing it

Is a television set a computer?



Input: information from cables or radio waves

Output: information as sound and picture

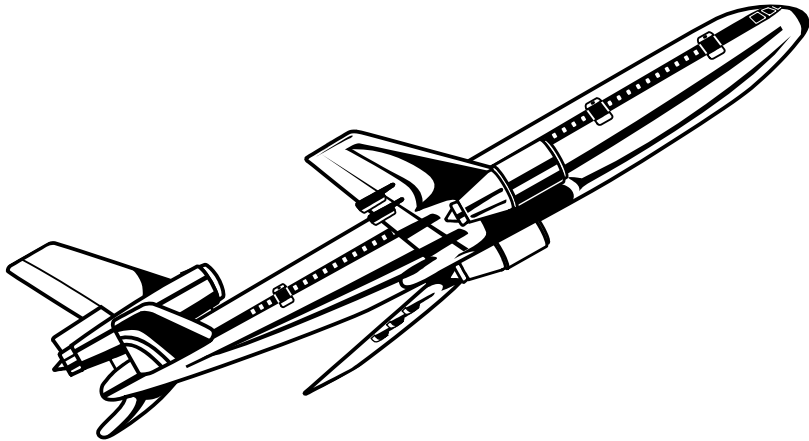
Does not process information by computing it

Computers *process* information by computing it

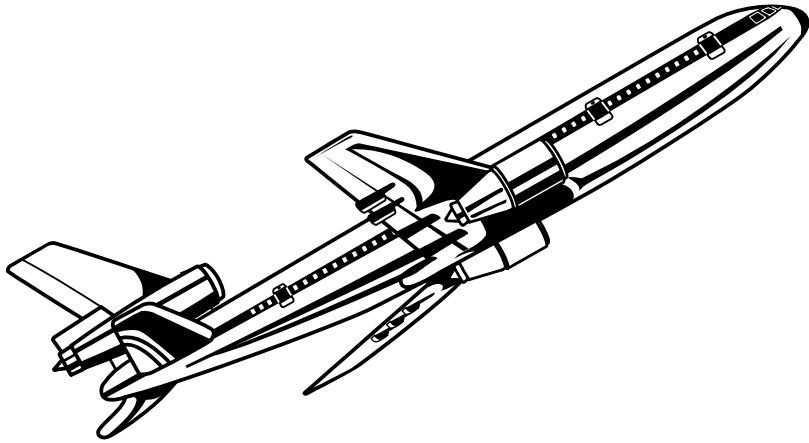
Is a modern airplane a computer?

Input: information from radio waves

Output: manipulations to the airplane



Is a modern airplane a computer?

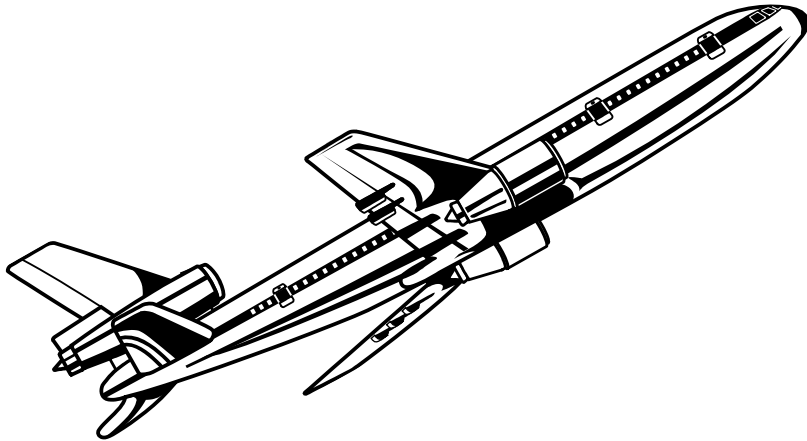


Input: information from radio waves

Output: manipulations to the airplane

Handles specific information

Is a modern airplane a computer?



Input: information from radio waves

Output: manipulations to the airplane

Handles specific information

Computers are *general purpose*

Is ordinary calculator a computer?



Input: numbers and
mathematical operations

Output: answer

Handles any numeric task

Is ordinary calculator a computer?



Input: numbers and mathematical operations

Output: answer

Handles any numeric task

Cannot be programmed

Is ordinary calculator a computer?



Input: numbers and mathematical operations

Output: answer

Handles any numeric task

Cannot be programmed

Computers are *programmable*

Definition of a Computer



Definition of a Computer

General purpose

Programmable

Computing the information

With input and output



Definition of a Computer

A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.



Functionalities of a Computer

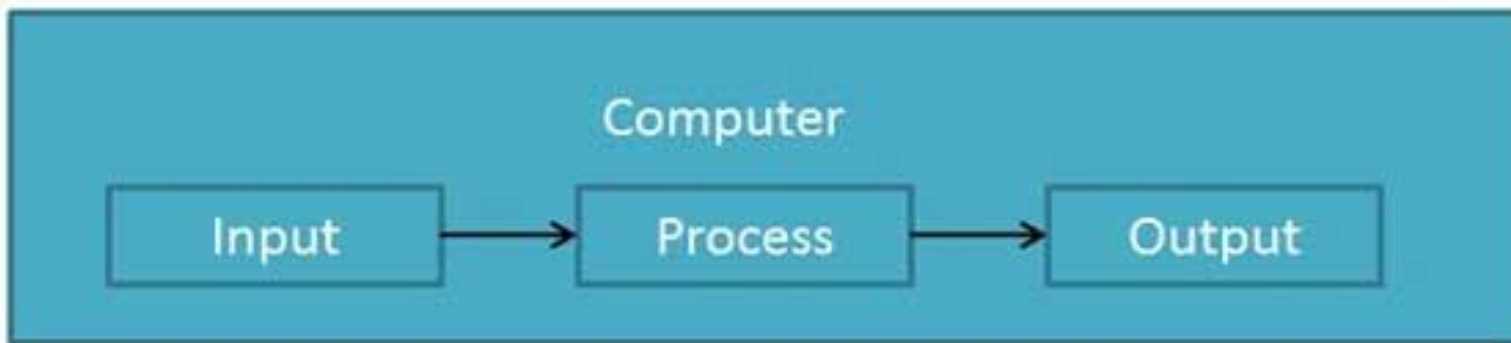
Step 1 – Takes data as input.

Step 2 – Stores the data/instructions in its memory and uses them as required.

Step 3 – Processes the data and converts it into useful information.

Step 4 – Generates the output.

Step 5 – Controls all the above four steps.



What can computers do?

What can computers do – today?

Business

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks
- And many more



Bank

Banking –
almost totally dependent on
computers.

Online accounting facility –
completely online

ATM machines –
completely automated



Insurance

- Procedure to continue with policies
- Starting date of the policies
- Next due installment of a policy
- Maturity date
- Interests due
- Survival benefits
- Bonus



Education

- The computer helps in providing a lot of facilities in the education system.



Marketing

- Advertising
- Home Shopping



Healthcare

- **Diagnostic System** – Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** – All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** – These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** – Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** – Nowadays, computers are also used in performing surgery.



Communication

- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing



Government

- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Computerization of PAN card
- Weather forecasting



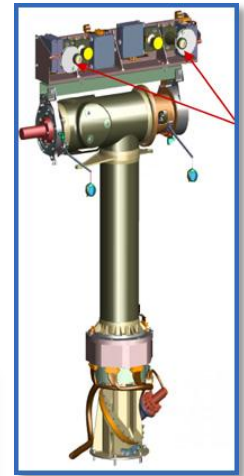
Military

- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons



Computer Vision

- Image Recognition
- Object Detection
- Image Captioning
- Automatic Vehicles
- Smart Cars
- Biomedical Image Analysis
- Face Detection
- Face Recognition
- Biometrics
- Forensics
- Sports
- Vision based interactions
- Robotics
- Action Recognition
- Many more



What might computers do—tomorrow?

What might computers do—tomorrow?

Diagnose diseases

Control robots that walk, talk, and learn

Compose music and create art

Information forensics

Artificial intelligence

And many more

Syllabus (Tentative)

Basic Computer Organization

Layers of Software

Operating Systems

Basic Linux Commands and Shell Scripting

Basics of Computer Networks

Basics of Mobile Devices

Books/Resources

1. Computer Architecture and Organization, John Hayes, Tata Mc-Graw Hill
 2. How Computers Work, Ron White, Que Publishing, 2014, ISBN 0-7897-4984-X (10th Edition)
 3. Overview of Computer Science, Philip Barry, University of Minnesota, 2015
 4. A Balanced Overview of Computer Science, David Reed, J. Glenn Brookshear, Pearson Custom Publishing, 2011
 5. Invitation to Computer Science, G. Michael Schneider, and Judith L. Gersting, Thompson (5th Edition), 2010
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Grading

15% Exam 1

15% Exam 2

30% Exam 3

40% Class and Lab Participation/
Surprise Test/Quiz/
Lab Evaluation/Project

Course Website

<https://sites.google.com/site/ase101iits/>

Questions ???

Thank You !!!
