

# Computer Programming

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?

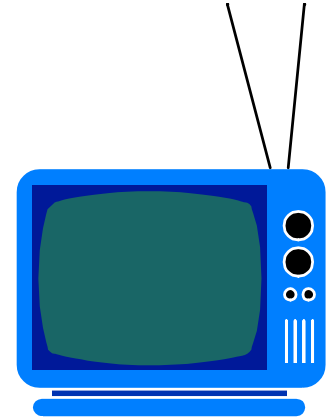
# Which one is the computer?



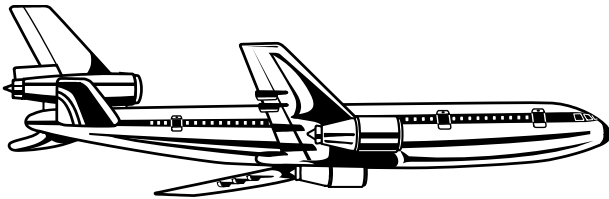
Rock



Calculator



Television



Modern Airplane



Washing Machine

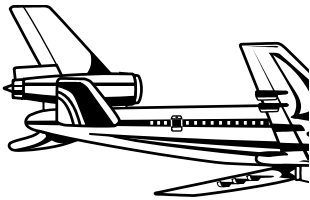


Computer Workstation

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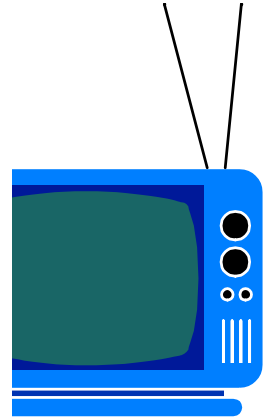
Rock



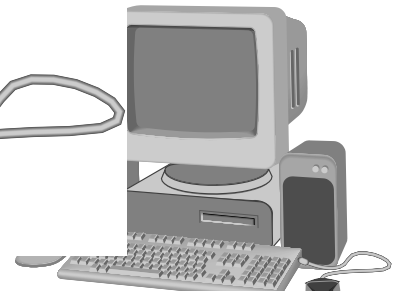
Model Airplane



Washing Machine



Television



Computer Workstation

# 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

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- ▶ Does not handle information

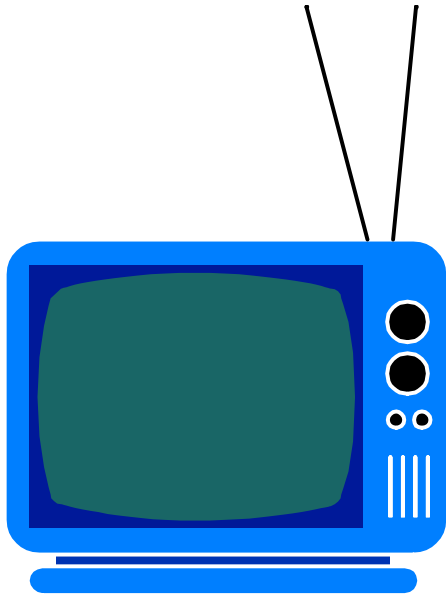
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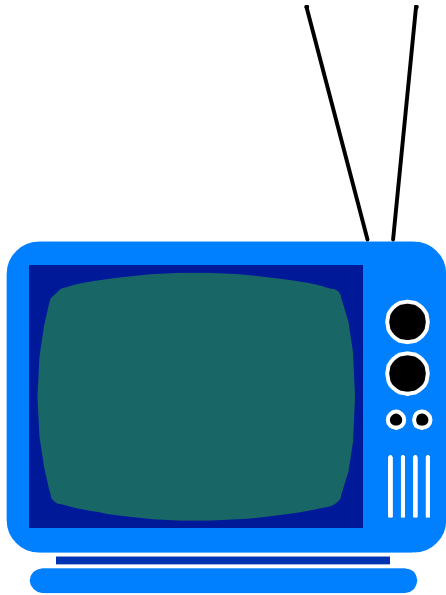
▶ Computers - input and output *information*

# Is a television set a computer?



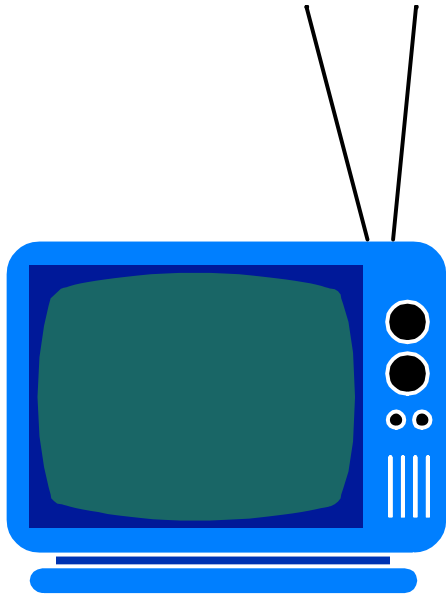
- ▶ Input: information from cables or radio waves
- ▶ Output: information as sound and picture

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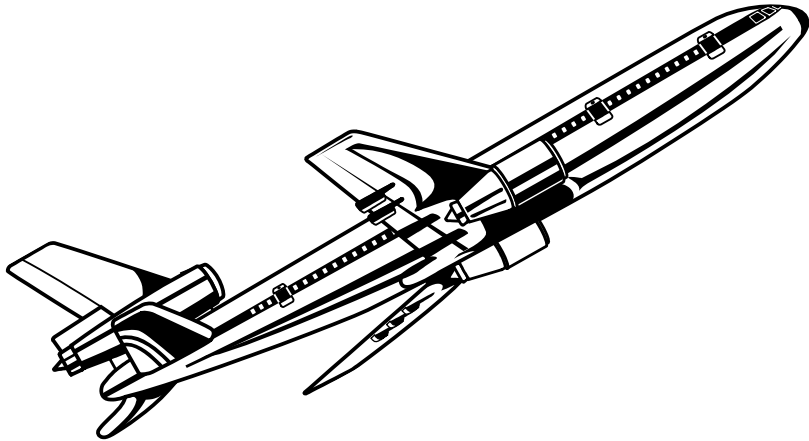


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- ▶ Output: information as sound and picture
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▶ Computers *process* information by computing it

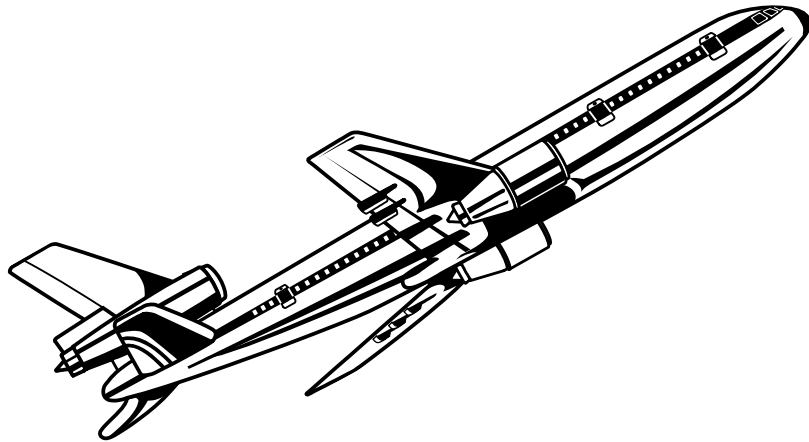
# Is a modern airplane a computer?

- ▶ Input: information from radio waves
- ▶ Output: manipulations to the airplane



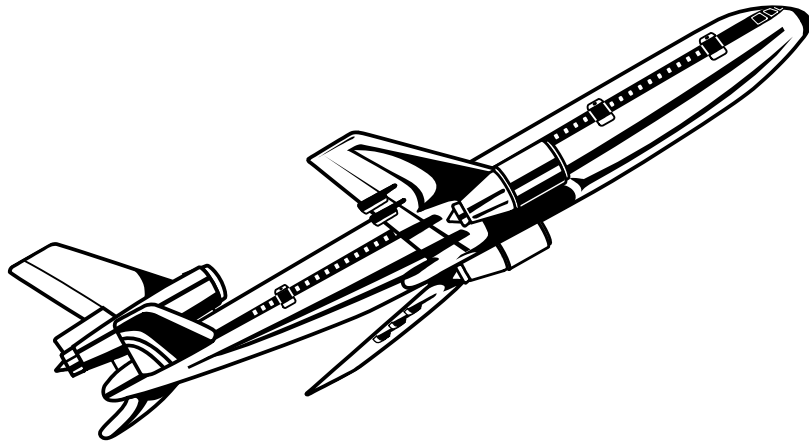


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- ▶ Input: information from radio waves
- ▶ Output: manipulations to the airplane
- ▶ Handles specific information

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- ▶ Input: information from radio waves
- ▶ Output: manipulations to the airplane
- ▶ Handles specific information

▶ Computers are *general purpose*

# Is ordinary calculator a computer?



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- ▶ Handles any numeric task

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▶ 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

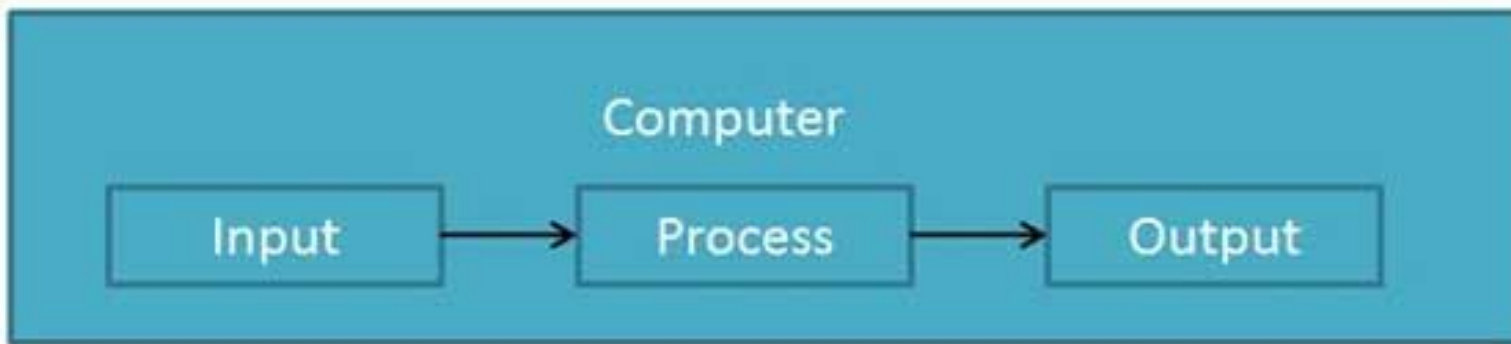
- ▶ A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.





# 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

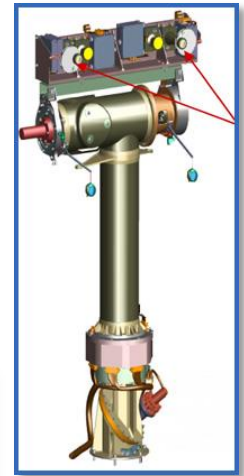
- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons



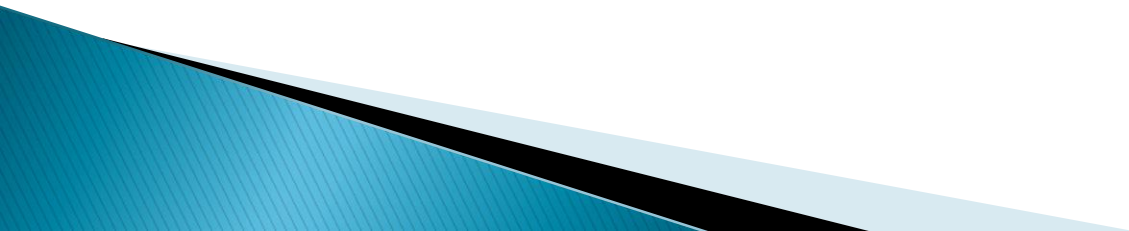


# Computer Vision

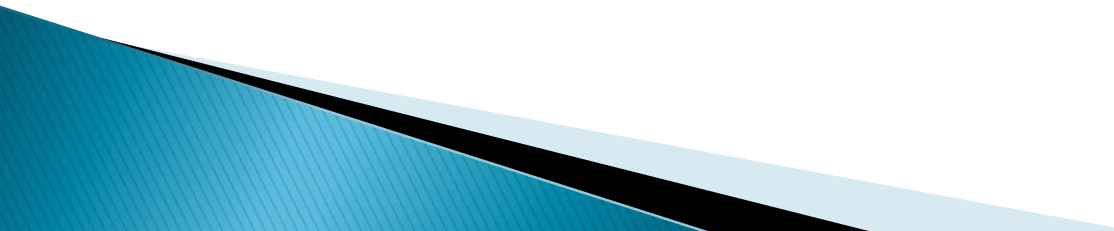
- Image Recognition
- Object Detection
- Image Captioning
- Automatic Vehicles
- Smart Cars
- Biomedical Image Analysis
- Face Detection
- Face Recognition
- Biometrics
- Forensics
- Sports
- Vision based interactions
- Robotics
- Action Recognition
- Many more .....



# 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 .....
- 

# Books/Resources

C: A Reference Manual  
Harbison & Steele  
5th edition, (C:ARM5, ISBN 0-13-089592X)

C Programming Language  
by Brian Kernighan and Dennis Ritchie  
Published by Prentice Hall  
2nd edition, ISBN# 0131103628

C - How to Program  
by Harvey Deitel and Paul Deitel  
Published by Prentice Hall  
3rd edition, ISBN# 0130895725

Programming in ANSI C  
by Balagurusamy  
8th Edition, McGraw Hill Education

Let Us C  
by Yashavant Kanetkar  
16th Edition, BPB Publications

The Practice of Programming  
by Kernighan and Pike  
Published by Addison Wesley

The Standard C Library  
by P.J. Plauger

The Unix Programming Environment  
by Kernighan and Pike

Mastering Algorithms with C (more  
advanced)  
by Kyle London  
O'Reilly

The Practice of Programming



Questions ???

Thank You !!!