PCPS

Unit - 1

CONTENTS

What does a computer do?

- Performs calculations
- Remembers Results

Tasks can be ?

- Computational ⟶ Solvable
- Non-computational ⟶ Not solvable

What do you need to solve a problem?

- Representation of the problem
- Making an algorithm

What's an algorithm?

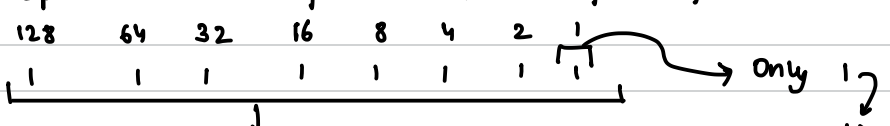
- A well defined step-by-step procedure to transform a given input into desired output

What's digital computer?

- Any device that is capable of solving problems by processing info in discrete form.
- It expresses data in binary (0's & 1's)

What's Binary System?

- Representation of data in the form of 0's & 1's



8 together ⇒ 8 bit or 1 byte

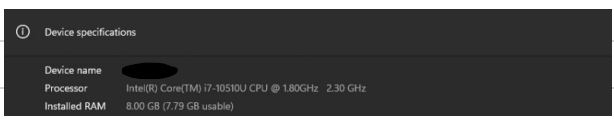
can read upto 255

What does computer hardware include?

- CPU ⟶ brain of computer
- Main memory → Place where currently running programs reside
- Secondary memory → Long term Storage of programs & data
  Non-volatile

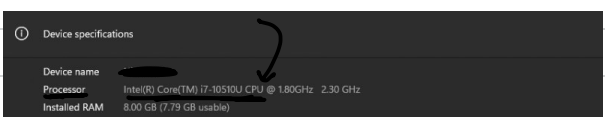
How to find system config. of your PC?

- System > About



What make is your processor?

-



What are available processors in markets

- Intel
  - → Celeron ⇒ 4 cores
  - → Pentium ⇒ 5 cores
  - → Core i3 ⇒ 8 cores
  - → Core i5 ⇒ 14 cores
  - → Core i7 ⇒ 20 cores
  - → Core i9 ⇒ 24 cores

Speed & Price ↓

- AMD
  - → Athlon - Silver ⇒ 2 cores
  - → Athlon - Gold ⇒ 2 cores
  - → Ryzen 3 ⇒ 4 cores
  - → Ryzen 5 ⇒ 6 cores
  - → Ryzen 7 ⇒ 8 cores
  - → Ryzen 9 ⇒ 16 cores

List some External Storage devices?

- Hard Disc
- DVD, CD
- Pendrives
- Floppy Disk
- Memory card

List some Input/Output devices?

- Mouse, Keyboard, Monitor, Printer, Speaker etc.,

What's system bus?

- A communication system that transfers data b/w components inside or b/w computer

What's System software?

- Software that controls computer's internal functioning through OS & controls other input/output devices as well

What's Application Software?

- Specific purpose software used to perform specific task.

What's Operating System?

- Software that manages & interacts with hardware resources of computer
- Linux, Android, Ubuntu, Apple, Windows, Fedora

What's Syntax ?

- Set of characters & acceptable sequences of those characters

ex: Hello, how are you ? ✓
Hello, are you how? ✓
Hello, hao are you? X

What's Semantics ?

- Meaning associated with each syntactically correct seq. of characters

Process for computation problem solving ?

- Analysis → Design → Implementation → Testing

What's constitutes of Solution ?

- A solution
- An approx solution
- A best solution
- All solutions

How does a computer follow commands of python ?

- Interactive mode - Run line by line
- Batch mode - Run all of code together

What's the structure of program ?

- Comments - One line starts with # ; Multiple are b/w pair of ''' or """
- Case Sensitive - Print() & print()

- No. of statements per line - Ideally 1 is preferred but multiple can be seperated by ;

What's a literal?

- Sequence of one (or) more characters that stands for itself
- Numeric?
  - Only digits and optional + or - and possible decimal point
    Can be integer, float
- String?
  - Literal containing any set of characters enclosed in quotes

What's Arithmetic Overflow?

- When calculated result is too large in magnitude to be represented
  (inf) → result

What's Arithmetic Underflow?

- When calculated result is too small in magnitude to be represented
  (0.0) → result

What are indentifiers?

- Sequence of 1 or more characters to provide a name for a given element

What's the naming convention for identifiers?

- Can begin only with a-z or A-Z
- Can't begin with numbers, or special characters
- Spaces aren't allowed. Underscore is used instead

What are Keywords?

- They are reserved words with predefined meaning

What are variables?

- It is a name associated with a value

  The420 = 69

What's Datatype?

- Set of values & set of operations that may be applied to those values like integer, float & strings

Output function?

- The print() function displays results on screen

print (value, ..., sep = ' ', end = '\n', file = sys.txt, flush = False)

- sep: seperation b|w values
- end: string appended at the last
- file: Reference to a file
- flush: whether to forcibly flush the stream

```
1  print('hey','how','are','you',sep=' ',end = '?')
```

→

```
hey how are you?
```

Input Function?

- input ([prompt])

```
1  input_variable = input('How are you?')
2  input_number_variable = int(input("What's your age?"))
```

→

```
How are you?good
What's your age?18
```

- What are expression then?
  - Its any value like constants, variables
    123, 'python', 'pesu is ok?', 0.69, a=20, 5+4, (45+24)

What are dem arithmetic operators?

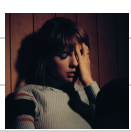
- addition, subtraction, multiplication, division, remainder, integer div
  ↳ + ↳ - ↳ * ↳ / ↳ % ↳ //

  exponent → **
  ↳ Only this is counted from right to left

left to right

What are logical operators?

- not, and, or
- Also, anything in python that contains a value is True
  like → True, 5, -6, 'u gt', ['we', 'don't', 'love', 'esa']
  and, anything empty is False
  like → False, 0, "", []



Not ur place swift

What are relational operators?

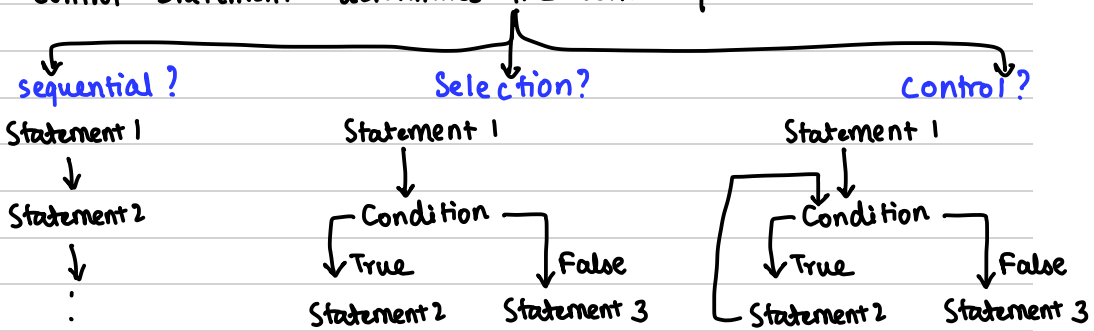
- Compare values with Boolean True & False
  like < , <= , > , >= , == , != , in , is

What's the priority of these operators like?

() → ** → *, /, //, % → +, - → << (Left shift), >> (Right shift) → & → AND → ^ → XOR → | → OR → ==, !=, >, >=, <, =<, is, is not, in, not in → not → and → or

What are CONTROL STRUCTURES !?

- Control flow is da order that instructions are executed in
- Control Statement determines the control flow



What's this spacing after some statements ?

- This spacing is called indentation
- Used for grouping particular type of statements

```
1  a = 1
2  if a > 0:
3      print('noice')
4  elif a>1:
5      print('noice2')
6  else:
7      print('noice3')
```

indentation

→ 1 type of statement

What's this iterative control ?

- Control structure that provides repeated execution of instructions
- For this we use while → use when you dk how many to execute
  - Control statement that repeatedly executes statements based on expression
  - Steps for using iterative control ?
    1) Initialize counter
    2) Iterative cond^n
    3) Update counter

Explain with example pweaseecee !!

```
1  i = 1
2  sum = 0
3  while sum < 30:
4      sum = sum + i
5      i = i + 2
6      print('process no:',i,'=>',sum,sep=' ')
7  print(sum)
```

→

```
process no: 3 => 1
process no: 5 => 4
process no: 7 => 9
process no: 9 => 16
process no: 11 => 25
process no: 13 => 36
36
```

What happens if some error happens during iteration?

- An ∞ loop is formed & doesn't terminate on own

How do I make a condition in some range?

- Use range() function
  range (start, stop, step)

```
1  for i in range(1,11,1):
2      print(i)
3
```

⟷

```
1
2
3
4
5
6
7
8
9
10
```

That was fine, but what's this 'for' statement?

- Works exclusively on collections until no element left in collection
  Just like above.
- The same code with while while give ∞ loop printing only '1'

Steps to use for loop?

1) Start iteration of Variable
2) Get element into variable
3) Execute the body
4) Repeat 2 & 3 till they are iterable
5) Move to next statement & exit for loop

Use when you know exactly how many you want to execute