

Diagram illustrating the carry propagation in a ripple-carry adder. The addition is shown as:

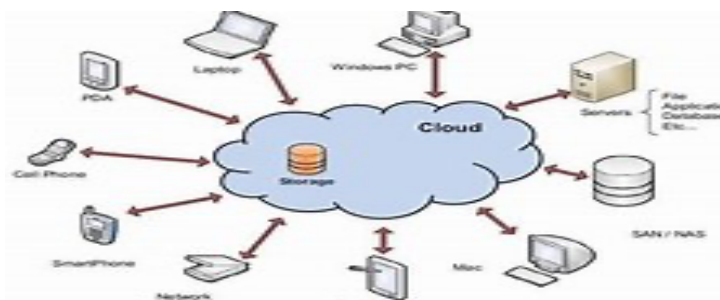
$$\begin{array}{r}
 1110 \\
 + 1100 \\
 \hline
 11010
 \end{array}$$

The result is 26 (11010). The carry propagation is indicated by red arrows showing the carry bit moving from right to left through the bits. The labels at the bottom indicate the carry bit and the rules for each bit position:

- Carry Bit
- Rule 5
- Rule 4
- Rule 2 or 3
- Rule 1

Internal hardware devices include motherboards, hard drives, and RAM.

Cloud storage is a cloud computing model in which data is stored on remote servers accessed from the internet, or "cloud".

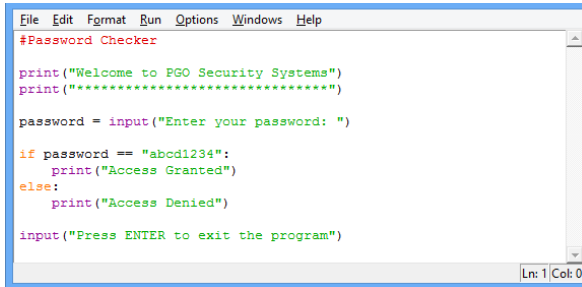


- Microsoft – Windows
- Apple – IOS
- Google - Android



Year 8 Python Knowledge Organiser

Programming with Python



```
File Edit Format Run Options Windows Help
#Password Checker

print("Welcome to PGO Security Systems")
print("*****")

password = input("Enter your password: ")

if password == "abcd1234":
    print("Access Granted")
else:
    print("Access Denied")

input("Press ENTER to exit the program")
```

Python's Development Environment

Called IDLE – Integrated Development Environment

Two Modes:

Interactive Mode lets you see your results as you type them.

Script Mode lets you save your program and run it again later.

Writing error-free code

When writing **programs**, **code** should be as legible and error free as possible. **Debugging** helps keep **code** free of **errors** and documenting helps keep **code** clear enough to read.

Syntax errors

Syntax is the spelling and grammar of a **programming language**. In **programming**, a **syntax error** occurs when:

- there is a **spelling mistake**.
- there is a **grammatical mistake**.

Data Types

String - holds alphanumeric data as text

Integer - holds whole numbers

Float - holds numbers with a decimal point

Boolean - holds either 'True' or 'False'

Defining Variable Data Types

Python automatically assigns a data type to a variable. You can override this to manually define or change the data type using:

Selection

When designing **programs**, there are often points where a **decision** must be made. This **decision** is known as **selection** and is implemented in **programming** using **IF statements**.

Operator	Meaning	Example	Evaluates to
==	equal to	7==7	True
!=	not equal to	6!=7	True
>	Greater than	7>6	True
<	Less than	5<8	True
>=	Greater than or equal to	6>=8	False
<=	Less than or equal to	7<=7	True

Iteration

Algorithms consist of steps that are carried out (performed) one after another. Sometimes an **algorithm** needs to **repeat** certain steps until told to stop or until a particular condition has been met.

Iteration is the process of repeating steps.

Variables

A **variable** is a location in **memory** in which you can temporarily store text or numbers. It is used like an empty box or the Memory function on a calculator. You can choose a name for the box (the "**variable name**") and change its contents in your **program**.



Using a Variable (firstname)

```
print ("What is your name?")
firstname = input()
```

Functions

Functions are special keywords that do a specific job. **Functions** appear in purple.

print() and **input()** are examples of functions

```
print ("What is your name?")
firstname = input()
print ("Hello,",firstname)
```

Adding Comments

Comments are useful to help understand your **code**. They will not affect the way a **program** runs. **Comments** appear in red and have a preceding **#** symbol.

```
#firstname is a variable
print ("What is your name?")
firstname = input()
print ("Hello,",firstname)
```

Year 8 Online safety Knowledge Organiser

Malware: What It Is

Malware is software created to harm computers or steal information without permission.

Types of Malware:

Type What It Does

Virus Copies itself and damages files or systems.

Worm Spreads across networks, slowing or damaging devices.

Trojan Horse Disguised as safe software but harmful inside.

Spyware Secretly collects and sends your data to others.

Ransomware Locks your files and demands money to unlock them.

Adware Shows unwanted ads and can lead to unsafe sites.

AI-Related Threats

Threat Description

Deepfakes AI-created fake videos/images that look real but are fake.

AI Scams & Impersonation AI mimics people's writing or speech to trick users.

Image Notification Tools AI tools misused to create fake inappropriate images (illegal and harmful).



Why It Matters

Protect yourself from identity theft, bullying, and scams.

Stay safe from harmful content and illegal activities online.

Learn to spot fake information and protect your digital reputation.



Online Safety Tips

Keep passwords private and use strong, unique passwords.

Don't open links or attachments from unknown or suspicious sources.

Download apps only from trusted stores (Google Play, Apple App Store).

Update devices regularly to fix security issues.

Think before you post — once online, content can be permanent.

Use privacy settings to control who can see your information.

Tell a trusted adult if something online makes you uncomfortable.

Be careful about sharing personal information (e.g., full name, address, school).



Year 8 Network Knowledge Organiser

What Is a Network? A **network** is a group of computers and devices connected together so they can share data, resources (like printers), and communicate with each other.

Advantages of Networks

Advantage	Why It Helps
File Sharing	Easily share files between devices.
Resource Sharing	Use shared printers, scanners, etc.
Communication	Send messages or emails across the network.
Central Backups	Files can be backed up on one central system.

Disadvantages of Networks

Disadvantage	Why It's a Problem
Security Risks	More vulnerable to hackers or viruses.
Expensive Setup	Equipment and installation can be costly.
Network Failure	If one part fails, it can affect the whole network.
Slower Performance	If many users are on at once, it can slow down.

Types of Networks

Type	What It Means
LAN (Local Area Network)	A small network in one building or site (e.g. a school or home).
WAN (Wide Area Network)	A large network over a wide area (e.g. the internet, connecting multiple locations).

Network Hardware

Hardware	What It Does
Router	Sends data between networks and connects to the internet.
Switch	Connects devices in a LAN and manages data flow.
Hub	Basic device to connect devices; sends data to all ports.
Modem	Connects a network to the internet (modulates/demodulates signals).
Network Cable (Ethernet)	Used in wired networks to physically connect devices.
Wireless Access Point (WAP)	Allows wireless devices to connect to the network.

Wired vs Wireless Connections

Wired Connection	Wireless Connection
Uses cables (e.g. Ethernet)	Uses Wi-Fi (radio signals)
More secure and faster	Easier to move devices around
Harder to install and move	Can be slower or lose signal

