



F9.7 Secondary storage

Logic and computer systems · GCSE · OCR J277 1.2.2, AQA 8525 3.4.5,
Edexcel 1CP2 3.1.2 · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Magnetic, optical, solid state and cloud storage, and choosing between them.

- Why secondary storage?
- Three technologies
- Choosing storage
- Cloud storage
- Speed matters too

Questions

6 marks in all

- Why do computers need secondary storage? [1 mark]
 - ☐ A It keeps programs and files when the power is off
 - ☐ B It is faster than RAM
 - ☐ C The CPU runs programs directly from it
 - ☐ D It holds the boot program
- Which storage suits a robot that vibrates across a mat? [1 mark]
 - ☐ A Solid state, because it has no moving parts
 - ☐ B A hard disk, because it has high capacity
 - ☐ C Optical, because discs are cheap
 - ☐ D Magnetic tape, because it is reliable
- How does optical storage read data? [1 mark]
 - ☐ A A laser reads pits and flat areas on a disc
 - ☐ B A head reads magnetised areas
 - ☐ C Electrical charges are read from chips
 - ☐ D A camera photographs the disc
- What is an advantage of a hard disk over an SSD? [1 mark]
 - ☐ A Lower cost per gigabyte
 - ☐ B Faster access
 - ☐ C No moving parts
 - ☐ D Lighter
- What is a drawback of cloud storage? [1 mark]
 - ☐ A It needs an internet connection
 - ☐ B Files cannot be shared
 - ☐ C It cannot be reached from a phone
 - ☐ D It has a fixed, small capacity

6. Copying a 3000 MB file at 150 MB per second takes how many seconds?

[1 mark]

The task: the storage chooser

Write `choose(needed_gb, no_moving_parts)`. It returns the name of the cheapest device in `devices` whose capacity is at least `needed_gb`, and which has no moving parts if `no_moving_parts` is `True`. A device's price in pence is its capacity times its pence per GB. Print one line for each job in `jobs`, in the form `robot logs: SD card`.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

# name, capacity in GB, pence per GB, has moving parts
devices = [
    ("hard disk", 2000, 2, True),
    ("SSD", 1000, 6, False),
    ("SD card", 256, 10, False),
    ("Blu-ray", 50, 4, True),
]
# job, GB needed, needs no moving parts
jobs = [("robot logs", 64, True), ("school backups", 1500, False), ("video editing", 500,
True), ("film archive", 40, False)]
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f9-7-secondary-storage/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Add a reading speed to each device, and let `choose` require a minimum speed.
2. Add magnetic tape: 12000 GB at 0.5 pence per GB. Which jobs change?
3. Write three sentences recommending storage for a school trip camera, using three different characteristics.