Open source and proprietary software

Computer systems (Paper 1) · revision notes

The difference between open source software, whose source code is available to view, change and share, and proprietary software, whose source code is kept secret and which is used under a restrictive licence. Questions ask you to define each type, give advantages and disadvantages, and recommend one for a user or organisation.

Key facts

- Open source: source code available; users can view, modify and share it (under its licence)
- Open source +: usually free, customisable, community support. −: may lack official support
- Both types of software have licences
- Proprietary: source code closed; licence restricts use; owned by a person or company
- Proprietary +: official support, well tested, familiar. −: cost, cannot be modified
- Open source is not always free of charge; proprietary is not always paid for

Notes

Open source software

- The **source code** is made available, so users can **view, modify and share** it, following the conditions of its licence.
- Usually **free of charge**. Examples: Linux, LibreOffice, Firefox and VLC media player.
- Advantages: it can be adapted to the user's needs; a community of developers can find and fix bugs quickly; anyone can check what the code does.
- Disadvantages: there may be no official support (help comes from forums and online communities); it may be less polished or have fewer features; some file formats may not be fully compatible; updates depend on the community and may stop.
- Some open source licences require anyone who shares a changed version to share it under the same licence, with its source code.

Proprietary software

- The **source code is not available** (closed source). The software is owned by a person or company and used under a **licence** that restricts how it can be used.
- Usually **paid for**, often bought **off-the-shelf**, with a one-off fee or a subscription. Examples: Microsoft Windows, Microsoft Office, Adobe Photoshop and macOS.
- Advantages: official support and regular updates; usually well tested and polished; widely used and familiar, so files are compatible and training is easy to find.
- Disadvantages: licences cost money; users cannot modify it; users depend on the company for fixes and new features; the licence limits the number of users or devices.
- Keeping the code secret protects the company's **intellectual property** and lets it earn money to fund development.

Choosing

- Tight budget, a need to customise, and technical expertise available → open source.
- Need for guaranteed support, specialist features or compatibility with other organisations → proprietary.

How to answer each type of question

State the difference between the two types — 1 to 2 marks — Grade 3

1. Focus on the source code: available or not.
2. Add what users may do: view, modify and share, or only use it under the licence terms.

Example. State **one** difference between open source and proprietary software. [1]

Model answer. The source code of open source software is available for users to view and modify, whereas the source code of proprietary software is kept secret (1).

Describe advantages and disadvantages — 2 to 4 marks — Grade 5

1. Give the advantage or disadvantage (1 mark).
2. Explain its effect on the user or organisation in the question (1 mark).

Example. Describe **one** advantage and **one** disadvantage to a business of using proprietary software. [4]

Model answer. Advantage: the company that makes it provides official support and regular updates (1), so problems can be fixed quickly by experts (1). Disadvantage: the business must pay for a licence for each user or device (1), which is expensive if it has many staff (1).

Recommend a type for a scenario — 4 to 6 marks — Grade 7

1. Pick out the user's needs: budget, number of users, need for support, need to change the code, compatibility.
2. Give a clear recommendation.
3. Justify it with points linked to the scenario, and deal with one drawback.

Example. A small software start-up has no money for licences and needs an operating system for its web servers. Its staff are expert programmers. Recommend whether it should use open source or proprietary software. Justify your recommendation. [4]

Model answer. Open source (1). It is usually free, so the start-up does not have to pay for licences it cannot afford (1). The staff are expert programmers, so they can modify the source code to suit their servers and fix problems themselves (1). There is no official support, but help is available from the community and the staff have the skills to manage without it (1).

8-mark: discuss switching software 8 marks (marked in levels) **Grade 8**

1. Weigh several issues: cost, support, compatibility, training, customisation, security.
2. Apply each issue to the organisation, e.g. its size and the people it works with.
3. Give both sides and end with a supported conclusion.

Example. A local council uses proprietary office software on 400 computers. Discuss whether it should switch to open source office software. [8]

Model answer.

Cost: open source office software is usually free, so the council could save the cost of 400 licences and spend the money on services for residents. However, it would have to pay to retrain 400 staff, and pay its own IT staff or a support company to install and support the new software.
Support and updates: proprietary software comes with official support and regular updates; open source relies on community support, although some companies sell support for it.
Compatibility: residents and other organisations may send documents in proprietary formats, which may not display perfectly in open source software, causing problems for staff.
Customisation and security: the council could adapt the open source code to its needs, and anyone can check the code for weaknesses, although this depends on the community keeping it updated.
Conclusion: the switch could save money in the long term, but the council should try it in a few departments first to check compatibility and training needs.
Top band (6–8 marks): weighs several issues on both sides, applies them to the council and its 400 computers, and reaches a supported conclusion.

Don’t lose marks

- Saying open source software has no licence or no copyright. It is licensed, and the licence sets conditions.
- Saying proprietary software is always paid for. Some is free to use, but its source code is still closed.
- Saying open source software must be less secure because anyone can see the code.
- Defining open source as just 'free software'. The key point is that the source code is available.

More tips

Memory tricks

- Open source = an open recipe: anyone can read, change and share it. Proprietary = a secret recipe: you can eat the dish but not see how it is made.
- 'Free' has two meanings: free of charge, and free to change. Open source is really about the second.
- Recommendation formula: needs → type → two reasons from the scenario → one drawback dealt with.

Exam technique

- Always mention the source code in definitions: it is the key mark point.
- In recommendation questions, either answer can score if it is justified using the scenario.
- In 8-mark questions, weigh cost against support, compatibility and training before concluding.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3 — **Define open source and proprietary software**
Open source: source code available to view, modify and share. Proprietary: source code closed; the licence restricts use.

Grade 4 — **Give examples of each type**
E.g. Linux and LibreOffice (open source); Microsoft Windows and Adobe Photoshop (proprietary).

Grade 5 — **Describe advantages and disadvantages of each**
E.g. open source is usually free and customisable but may lack official support.

Grade 6 — **Describe what licences allow and forbid**
Proprietary licences usually forbid copying, sharing and modifying; open source licences allow these under conditions.

Grade 7 — **Recommend a type of software for a scenario**
Weigh cost, support, customisation and compatibility for the user, and justify the choice.

Grade 8 — **Evaluate open source for an organisation**
Discuss cost, support, compatibility, training and security in an extended answer with a conclusion.

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