

Exercise walk-through

Ethics and Ownership ■ 7.1

eXercise

You must be able to

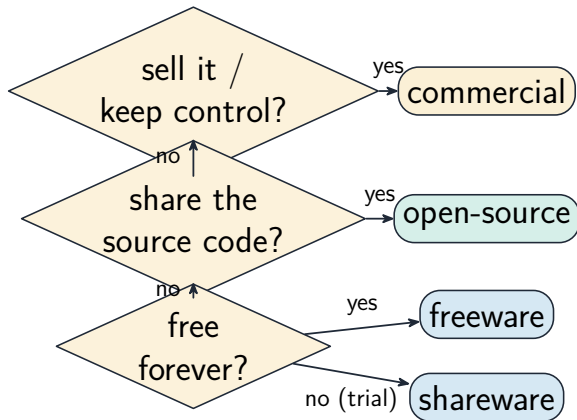
- explain why a computing professional must act **ethically** 伦理, and the impact of acting ethically or not
- explain the need for **copyright** 版权 legislation
- describe the types of **software licence** and justify a licence for a given situation

Method — Professional ethics

A computing professional's work (software, data, networks) affects people who often cannot judge it themselves, so the profession follows shared **ethics**. Key principles: put the **public interest first**, be **honest** about your competence, keep data **confidential**, avoid **conflicts of interest**, and respect **intellectual property** 知识产权 and privacy. Acting **ethically** protects users and builds trust; acting **unethically** (skipping testing, hiding bugs, misusing data) can harm users and lead to dismissal, legal action and lost trust.

Many professionals join a **professional body** 专业团体 (such as the BCS) and follow its **code of conduct** 行为准则. Belonging shows a commitment to high standards, gives access to training and up-to-date guidance, and reassures employers and the public; **not** belonging can mean missing this guidance and being trusted less.

Method — Professional ethics



Software ownership is governed by the type of licence granted

Method — Copyright

Copyright is the creator's automatic legal right to control how an original work (code, images, music, documents) is **copied, distributed, modified and performed**. It rewards creators so more software is made. It does **not** cover a general idea or algorithm — those may be protected by a **patent** 专利.

Method — Software licences

Licence	You may...	Source code	Cost
proprietary 专有	use under strict terms	hidden	paid
open source / FOSS 开源	use, view, modify, share	available	usually free
freeware	use for free	hidden	free
shareware	try free, then pay to keep	hidden	trial then paid

Justify by need: a company protecting its product → proprietary; a school wanting to install and adapt software freely → open source.

Practice 2.1 ■ 2 marks

State **two** reasons ethics matters for a computing professional.

Solution 2.1

Method: Professional ethics

Worked steps

Any two of: software affects people's safety/money; users must be able to **trust** professionals; poor/dishonest work can cause real harm **B1** **B1**.

Practice 2.2 ■ 1 mark

State what **copyright** protects.

Solution 2.2

Worked steps

The right to control how an **original work** (code, images, music, documents) is copied, distributed, modified and performed **B1**.

Practice 2.3 ■ 1 mark

Name the licence type where the **source code is available to view and modify**.

Solution 2.3

Method: Software licences

Worked steps

Open source (FOSS) **B1**.

Practice 2.4 ■ 1 mark

Give one ethical principle a computing professional should follow.

Solution 2.4

Method: Professional ethics

Worked steps

Any one: public interest first; honesty about competence; confidentiality; avoid conflicts of interest; respect intellectual property **B1**.

Exam-style 3.1 ■ 2 marks

Explain one impact of a software developer acting **unethically**.

Solution 3.1

Method: Professional ethics

Worked steps

Any one impact, explained, e.g.: hiding a bug could **harm users** (a medical/banking system fails) **B1**, and the developer may face dismissal or legal action and lost trust **B1**.

Exam-style 3.2 ■ 2 marks

(a) State one thing copyright **does** protect, and (b) one thing it does **not** protect.

Solution 3.2

Method: Copyright

Worked steps

- (a) e.g. the actual program code / an image / a document (an original work) **B1**.
- (b) A general **idea or algorithm** (which may instead be patented) **B1**.

Exam-style 3.3 ■ 3 marks

Compare **proprietary** and **open-source** software licences.

Solution 3.3

Method: Software licences

Worked steps

Proprietary: source code hidden, used under strict paid terms **B1**; open source: source available to view, modify and share, usually free **B1**; so open source allows adaptation while proprietary protects the developer's product **B1**.

Exam-style 3.4 ■ 2 marks

A school wants software it can install free on all its PCs and adapt for its own use.
State a suitable licence type and justify your choice.

Solution 3.4

Method: Software licences

Worked steps

Open source (FOSS) **B1** — it is free to install on every PC and the school may legally modify it for its own needs **B1**.

Exam-style 3.5 ■ 2 marks

Explain **two** reasons a computing professional might join a **professional ethical body** (such as the BCS).

Solution 3.5

Method: Professional ethics

Worked steps

Any two of: to follow a shared **code of conduct** / ethical standards; access to **training** and up-to-date professional guidance; recognition and **trust** from employers and clients; networking with other professionals **B1** **B1**.

Exam-style 3.6 ■ 4 marks

A school introduces an AI tool that marks students' essays and suggests improvements.

- (a) **Describe** two **social** impacts of students using AI to complete their homework.
- (b) **Describe** one **ethical** impact of the school using AI to mark work.
- (c) **Give** three ethical considerations for a student using their **personal** computer to connect to the school network.
- (d) The AI was trained on essays from one country only. **Explain** why this could make its marking unfair, and **state** what the developers should do about it.
- (e) A teacher argues that the school should publish how the AI reaches its decisions. **Explain** one benefit and one drawback of doing so.

Solution 3.6

Method: Professional ethics

Worked steps

(a) Any two, developed. Students may stop developing their **own** writing and reasoning skills, because the tool does the difficult part for them **B1 B1**. It can widen inequality: students who can afford the better tools gain an advantage over those who cannot **B1 B1**. Also acceptable: teachers can no longer tell what a student actually knows, so support is misdirected; students may pass work off as their own, which is plagiarism.

(b) Any one, developed: the AI may be **biased** against certain writing styles or dialects and mark them down unfairly **B1 B1**; or a student has no way to appeal to a human

Solution 3.6

if the reasoning behind the mark is hidden **B1 B1**.

(c) Any three: obtain **permission** before connecting a personal device; do not attempt to access other people's files or accounts; keep antivirus and operating system up to date so the network is not put at risk; do not install or share unlicensed software; respect the school's acceptable-use policy **B1 B1 B1**.

(d) Essays written in another country will use different conventions, vocabulary and cultural references, which the AI has not learned to reward **B1**, so equally good work is marked lower — the model is **biased** by its training data **B1**. The developers should train and test it on a **representative** range of student writing and check the marks it gives across those groups **B1**.

(e) Benefit: students and teachers can see **why** a mark was given, challenge it, and trust the system more **B1**. Drawback: publishing the method lets students **write to**

Solution 3.6

the algorithm rather than write well, and may expose commercially sensitive details of the model **B1**.