

# **PiXL Independence:**

## **Computer Science – Student Booklet**

### **KS4**

#### **Contents:**

- I. Multiple Choice Quizzes – 10 credits per quiz
- II. Exam Style Questions – 10 credits each
- III. Academic Articles – 50 credits each
- IV. Books for Further Reading – 50 credits each

## I. Multiple Choice Quizzes

Complete the quizzes.

Ensure that you read all questions carefully as there may be multiple correct answers.

### Test 1

1. Which of the following is not an example of a software utility?
  - a. Disk defragmentation.
  - b. Word processor.
  - c. File compression.
  - d. System diagnosis tools.
  
2. Which of the following describes the term secondary storage?
  - a. A storage device which will store data permanently until it is deleted.
  - b. Storage which helps the processor to complete the fetch-decode-execute cycle effectively.
  - c. A storage device that stores data temporarily while it is being used.
  - d. A storage device which has a small capacity and stores frequently used instructions.
  
3. Which type of backup is quickest to restore a file from?
  - a. Full.
  - b. Incremental.
  - c. Differential.
  - d. Virtual.
  
4. Which number system is a MAC address usually written in?
  - a. Denary.
  - b. Binary.
  - c. Hexadecimal.
  - d. Base 2.

5. Which of the following correctly describes a virtual machine?
- a. A computer program which allows you to access your files remotely.
  - b. Software which is installed on a host computer to act like a separate computer.
  - c. A computer which is controlled remotely over the internet.
  - d. A computer with software which allows you to use virtual reality software.
6. Which of the following are drawbacks of using a command line interface?
- a. It is harder to learn how to complete simple tasks.
  - b. You have to type individual commands so it can be much slower.
  - c. It is much quicker because you can just type the commands for the task that you need.
  - d. It is harder to make mistakes.
7. Which of the following are stored in the RAM?
- a. The instructions required to load the Operating System.
  - b. The data for any unsaved documents which are currently being worked on.
  - c. Files which are stored long term so that you are able to access them later.
  - d. The programs which are currently running on the computer.
8. Which of the following is not a component of the CPU?
- a. Arithmetic logic unit.
  - b. Virtual memory.
  - c. Control unit.
  - d. Cache memory.
9. Which of the following describes a Local Area Network?
- a. A network which makes use of the public phone network to establish a connection between computers.
  - b. Computers are connected over a large geographical area.
  - c. Computers connected together over a small geographical area such as a single building or site.
  - d. Computers that are connected together using a wired connection.

10. Which of the following statements are true? Under the Freedom of Information Act...

- a. Public authorities must publish certain information about their activities.
- b. Members of public are entitled to request information from public authorities.
- c. Members of public are entitled to request information from any company.
- d. Members of public are able to request all information held about them by public authorities.

## Test 2

1. Which of the following correctly describes the term standalone computer?
  - a. A computer which has a special role within a network.
  - b. A computer that is not connected to another networked device.
  - c. A computer that is not connected to any peripheral devices.
  - d. A computer has lost its internet connection due to a problem.
  
2. What does 'breaking down a large problem into smaller sub-problems' mean?
  - a. Algorithmic thinking.
  - b. Abstraction.
  - c. Computational thinking.
  - d. Decomposition.
  
3. Which of the following describe proprietary software?
  - a. The source code can be copied and modified.
  - b. The software cannot be copied or modified.
  - c. You usually need to purchase a licence to use the piece of software.
  - d. The software is usually free and publicly available.
  
4. Which of the following are examples of peripheral devices?
  - a. Printer.
  - b. CPU.
  - c. Keyboard.
  - d. RAM.
  
5. Which component within the CPU is for transporting instructions back from the RAM?
  - a. ALU.
  - b. Data Bus.
  - c. Address Bus.
  - d. Accumulator.

6. Which of the following backup types will store copy of only the files which have changed since the last full backup, regardless of which type of backup was performed last?
- Part backup.
  - Incremental backup.
  - Differential backup.
  - Cloud backup.
7. Which of the following is stored in the cache memory?
- Instructions required to load the computer.
  - Frequently used instructions and data.
  - Programs which are currently being used by the computer.
  - Files which can be accessed at a later time.
8. Which of the following is a correct benefit of using a wired network over a wireless network?
- Wired networks are usually faster than wireless networks.
  - Wired networks can perform badly due to outside interference.
  - Wired networks are usually more secure than wireless networks.
  - Wired networks are cheaper to set up and easier to install than wireless networks.
9. Which of the following is not an example of system software?
- Drivers.
  - BIOS.
  - Firewall.
  - Operating System.
10. Which of the following is a type of network policy?
- Acceptable Use Policy.
  - Data Protection Policy.
  - Ethical Concerns Policy.
  - Data Transfer Policy.

### Test 3

1. Which of the following are correct characteristics of a graphical user interface?
  - a. It is always the best to use for complicated tasks.
  - b. It is quicker as you do not have to learn complicated commands.
  - c. It is easy to use, especially for a beginner.
  - d. It is slower than using a command line interface.
  
2. Which computer component is assigned a MAC address?
  - a. Router.
  - b. NIC Card.
  - c. Modem.
  - d. CPU.
  
3. Why is data split into packets before it is sent over a network?
  - a. Sending smaller chunks of data makes the data more secure.
  - b. Sending smaller chunks of data enables files be sent more efficiently.
  - c. Sending smaller chunks of data takes up less of the computers resources.
  - d. Sending smaller chunks of data means that not as much data needs to be sent.
  
4. Which of the following are characteristics of solid state storage?
  - a. It is durable and is not easily damaged.
  - b. It has moving parts and can be easily damaged when moved or dropped.
  - c. It is one of the cheapest forms of storage.
  - d. It can be easily scratched.
  
5. Which of the following is a correct benefit of using a wireless network over a wired network?
  - a. Wireless networks are usually faster than wired networks.
  - b. Wireless networks are usually more secure than wired networks.
  - c. Using a wireless network allows you to use devices that can be portable.
  - d. Wireless networks are cheaper to set up and easier to install than wired networks.

6. Which of the following describes the term 'system software'?
- a. Software that allows you to perform simple tasks on a computer.
  - b. Software that is stored in the ROM which allows the Operating System to load.
  - c. Software that allows you to interact with the computer.
  - d. Software that is needed to control the computer's hardware.
7. Which secondary storage type would be most suitable to be used in a device which is likely to be carried around?
- a. Solid state.
  - b. Magnetic.
  - c. Optical.
  - d. Read Only Memory.
8. Which of the following accurately defines the term 'volatile'?
- a. Memory that stores items long term which can be accessed again later.
  - b. Memory that loses its contents when the power is turned off.
  - c. Memory which is only needed when the RAM is full.
  - d. Memory which is durable and portable.
9. Which of the following is not a benefit of using a client-server network over a peer-to-peer network?
- a. Peripheral devices can only be accessed from the device that they are connected to.
  - b. Users' accounts can be controlled and managed centrally.
  - c. The internet can be shared between devices connected to the network.
  - d. Files are stored centrally so they are easier to backup.
10. Which of the following describes a DDOS attack?
- a. Overloading a website with unwanted traffic so that it cannot function correctly.
  - b. Installing spyware on a computer so that it cannot function correctly.
  - c. Sending a virus to a computer so that it cannot function correctly.
  - d. Capturing someone's personal data and using this to commit fraud.



## Test 4

1. What does the term primary storage refer to?
  - a. A device which will store data permanently until it is deleted.
  - b. Memory that the CPU accesses first or directly.
  - c. Memory which is not volatile.
  - d. A device which stores data using magnetised disks.
  
2. What is the purpose of a Creative Commons License?
  - a. To allow people with protected work to allow free distribution of their work.
  - b. To stop people from using your work or changing your work without permission.
  - c. To make people purchase a licence before they can use something which you have created.
  - d. To make sure that your work is protected by the Copyright, Designs and Patents Act.
  
3. You can change the channel that your wireless connection uses. Why is this important?
  - a. To protect your wireless network from viruses and other malicious attacks.
  - b. To make your wireless network more secure.
  - c. To avoid interference with other wireless networks.
  - d. To encrypt your wireless connection.
  
4. Which of these is not a feature of an Integrated Development Environment?
  - a. Error diagnostics.
  - b. Run-time environment.
  - c. An interpreter.
  - d. Defragmentation of code.
  
5. Which of the following temporarily holds the address of the next instruction before it is sent to the RAM?
  - a. Memory Address Register.
  - b. Memory Data Register.
  - c. Program Counter.
  - d. Accumulator.

6. What must an Operating System have to enable a user to interact with it?
- User interface.
  - User management.
  - User accounts.
  - Virtual interaction.
7. Which piece of computing legislation makes hacking illegal?
- Data Protection Act.
  - Copyright Act.
  - Hacking Act.
  - Computer Misuse Act.
8. Which component within the CPU is responsible for performing mathematical operations?
- ALU.
  - Control Unit.
  - Data Bus.
  - Accumulator.
9. Encryption is...
- Collecting fragments of files on a hard drive so that they are all located together.
  - A method of scrambling data with a key code which makes no sense if it is intercepted.
  - A way of reducing the size of a file where the original file can be restored later.
  - Sending data from one place to another which is not protected.
10. Which of the following explains the term ethical?
- In accordance with principles of conduct that are considered correct.
  - Behaving in ways considered by most people to be correct and honest.
  - Breaking laws which are enforced within a country.
  - Adhering to the customs which are followed within a certain country.

## Test 5

1. Which of the following correctly describes the stakeholder?
  - a. A person that owns a proprietary piece of software.
  - b. A person who is involved in an issue/problem either directly or indirectly.
  - c. A person that buys a licence to use a piece of software
  - d. A person who has data held about them by an organisation.
  
2. Disk defragmentation is when...
  - a. Data/parts of files are grouped together on a hard drive.
  - b. Data that is stored on a disc is decompressed.
  - c. A hard drive that is fragmented into different pieces so that files can be split into groups.
  - d. Parts of files are separated across a hard drive.
  
3. Which of the following statements is true?
  - a. An IP address is assigned to a device when it is manufactured.
  - b. An IP address isn't required to send data between two networked devices.
  - c. An IP address is assigned to a device on a network by a server.
  - d. An IP address is the physical location of a device that is connected to a network.
  
4. Which of the following is a benefit of using a star network topology?
  - a. A star network is secure because it is always a wired network.
  - b. If a cable fails only one computer is connected as each has its own connection.
  - c. A star network is cheap to set up as limited hardware is required.
  - d. Each device has multiple connections to allow for redundancy.
  
5. Which of the following temporarily holds the result of the calculations performed by the ALU?
  - a. Memory Address Register.
  - b. Memory Data Register.
  - c. Program Counter.
  - d. Accumulator.

6. Which of the following affects the performance of a computer?

- a. The size of the Read Only Memory.
- b. Clock speed.
- c. Cache size.
- d. The size of the Virtual Memory.

7. Which of the following components are not present in a CPU?

- a. Memory Address Register.
- b. Program Counter.
- c. Instruction Data Register.
- d. Accumulator.

8. What does HTTP stand for?

- a. Hyper Text Transfer Procedure.
- b. Hyper Threading Transfer Procedure.
- c. Hyper Text Timing Protocol.
- d. Hyper Text Transfer Protocol.

9. A quad core processor refers to...

- a. A CPU which has 4 different pieces of cache memory.
- b. A CPU which has 4 processors inside.
- c. A CPU which has 2 processors inside.
- d. A CPU with 4 times the clock speed.

10. Processor speed is measured in...

- a. Second.
- b. Hertz.
- c. Instructions.
- d. Bytes.

## Test 6

1. Which of these is not a protocol?
  - a. HTTP.
  - b. DTP.
  - c. DNS.
  - d. TCP/IP.
  
2. What does 'representing problems using algorithms and symbols, and removing details that are not required' describe?
  - a. Algorithmic thinking.
  - b. Abstraction.
  - c. Computational thinking.
  - d. Decomposition.
  
3. Which of the following is a drawback of using a star network topology?
  - a. If the central device fails, all connected devices will not work.
  - b. There are lots of data collisions.
  - c. Lots of cable is needed so it can be quite costly to install.
  - d. New devices cannot be added without disrupting the rest of the network.
  
4. Which backup method takes longer to perform?
  - a. Incremental.
  - b. Fragmented.
  - c. Full.
  - d. Differential.
  
5. Which of the following is not a type of secondary storage?
  - a. Read Only Memory.
  - b. Solid state hard drive.
  - c. Magnetic hard drive.
  - d. Blu-ray disk.

6. Which of the following is not a type of malware?

- a. Phishing.
- b. Trojan Horse.
- c. Worm.
- d. Virus.

7. Which of the following correctly describes the term 'intellectual property'?

- a. Information which is made publicly available under law.
- b. An individual's data which must be kept securely.
- c. Anything which has been created using the mind.
- d. Physical items which have been created.

8. Packet switching is...

- a. Data which has been separated on a storage device and needs to be put back together.
- b. When data is decompressed and it needs to be returned to its original state.
- c. Breaking down a file into small pieces of data so that it can be sent across a network.
- d. Used to enable files to be shrunk before sending them across the internet.

9. Which of the following describes a Wide Area Network?

- a. Computers that are connected together using a wireless connection.
- b. Computers are connected over a large geographical area.
- c. A network which has multiple connections between the computers on the network to allow for redundancy.
- d. Computers connected together over a small geographical area such as a single building or site.

10. Which of the following describes virtual memory?

- a. When registers are used to store data/instructions during the Fetch Decode Execute Cycle.
- b. Memory which stores the instructions which are required to start the computer.
- c. When the RAM is used to store instructions being processed by the CPU.
- d. When the CPU uses Secondary Storage to replicate the job of the RAM when the RAM is full.

## Test 7

1. Which of the following correctly describes DNS?
  - a. A server on the internet which holds a list of domain names for search engines.
  - b. A server on the internet which holds a list of all domain names and associated IP addresses.
  - c. A technology which the router uses to read data packets.
  - d. A protocol which allows data to be sent securely.
  
2. Which of the following describes lossy compression?
  - a. Reducing the size of a file so that nothing is lost.
  - b. When the size of the data is reduced but the original file can be restored.
  - c. When some original data is lost and the original file cannot be re-created exactly.
  - d. Where 'lost' parts of files are restored to get the original file back.
  
3. Which of the following usually describes the term utility software?
  - a. A piece of software which is supplied with the source code.
  - b. A small piece of software which is part of the operating system.
  - c. A piece of software which has many features.
  - d. A piece of software which is usually free of charge.
  
4. Which of these is not a valid IP address?
  - a. 140.255.0.1
  - b. 10.12.8.100
  - c. 192.168.12.260
  - d. 192.14.143.198
  
5. In the Fetch-Decode-Execute cycle, where does the CPU fetch instructions from?
  - a. The ROM.
  - b. The RAM.
  - c. Secondary Storage.
  - d. Flash Memory.

6. What is the role of a router in a network?
- a. Stop something on the internet from connecting to your computer without you knowing.
  - b. Direct packet of data between networks/on the internet.
  - c. Direct packets of data around a network.
  - d. Enable you to have a wireless connection on your network.
7. Which of the following would be the most appropriate form of secondary storage to use in a desktop computer which is used to store large video files?
- a. Solid state storage.
  - b. Magnetic hard drive.
  - c. Optical storage.
  - d. ROM.
8. What does 'duplicating material which is property of a company or individual' describe?
- a. Ethical issues.
  - b. Copyright.
  - c. Cultural issues.
  - d. Data Protection.
9. Which of the following is an example of a network forensic technique?
- a. Using anti-spyware software to scan a computer.
  - b. Ensuring that a firewall is detecting connections to a computer.
  - c. Installing antivirus on a computer.
  - d. Packet sniffing.
10. Which of the following defines a virtual network?
- a. Computers which are networked using the internet and spanning more than one location.
  - b. Controlling computers and devices remotely via the internet.
  - c. A network which is created between two devices such as a Bluetooth network between two phones.
  - d. A network which is not physical e.g. a wireless network.



## Test 8

1. Which of these is not a protocol?
  - a. FTP.
  - b. MSN.
  - c. IMAP.
  - d. POP.
  
2. Which of the following describes lossless compression?
  - a. Reducing the size of a file and using encryption so that nothing can be lost.
  - b. No data is lost and the original file can be re-created from the data that has been compressed.
  - c. When some original data is lost and the original file cannot be re-created exactly.
  - d. Where some parts of the file are lost when the file is being compressed.
  
3. Which of the following are stored in the ROM?
  - a. Bootstrap Loader.
  - b. Basic Input Output System.
  - c. Operating System.
  - d. Programs that are currently running on the computer.
  
4. Which of the following correctly defines the internet?
  - a. The World Wide Web where you can access websites.
  - b. A connection that you make to a server to see a website.
  - c. A worldwide connection of computer networks.
  - d. Websites that you can access through a web browser.
  
5. What network has a device such as a server or switch placed at the centre and the devices connecting to it?
  - a. Ring.
  - b. Star.
  - c. Mesh.
  - d. Bus.

6. What is the purpose/function of SQL?
- a. To send files securely across the internet.
  - b. To interact with a Database.
  - c. To establish a secure connection between two devices.
  - d. Commands that are used to store data when using a programming language.
7. Which of the following would be the most appropriate form of secondary storage to use in a tablet computer?
- a. Solid state storage.
  - b. Magnetic hard drive.
  - c. Optical storage.
  - d. ROM.
8. Which of these is not covered by the Data Protection Act?
- a. The copyright of data.
  - b. The security of data.
  - c. The accuracy of data.
  - d. The access to data.
9. Which of the following will not be contained within a data packet?
- a. The address of the sender as an IP address.
  - b. A sequence number for each packet.
  - c. A 'time to live' which limits the lifespan of a packet on a network.
  - d. Data recording the path that the packet has taken across the network.
10. Which of the following types of memory is located in the CPU?
- a. Cache memory.
  - b. Flash memory.
  - c. Virtual memory.
  - d. Core memory.

## Test 9

1. Which of the following is not a purpose/function of the Operating System?
  - a. Provide a way for the user to interact with the device.
  - b. Backup files from one device on a network to another.
  - c. Manage the CPU and ensure that all software has access to it when needed.
  - d. Enable you to send files through the internet.
  
2. What does 'arranging parts of files on a secondary storage device so that they are in sequence' describe?
  - a. Disk defragmentation.
  - b. File fragmentation.
  - c. File storage.
  - d. Memory organisation.
  
3. A magazine is giving away free design software. Which of the following would be the most appropriate form of secondary storage to use?
  - a. Solid state storage.
  - b. Magnetic hard drive.
  - c. Optical storage.
  - d. ROM.
  
4. Which of the following describe open source software?
  - a. The source code can be copied and modified.
  - b. The software cannot be copied or modified.
  - c. You usually need to purchase a licence to use the piece of software.
  - d. The software is usually free and publicly available.
  
5. Which of the following statements are true? Under the Data Protection Act you are able to...
  - a. Request access to any data held by a company.
  - b. Request any data held on you by a company for a fee.
  - c. Request any data held on you by a company for free.
  - d. Request access to any data held by a company for a fee.

6. What is required to decrypt a file?

- a. A key.
- b. A code.
- c. A password.
- d. A cypher.

7. When may you want to use HTTPS and not HTTP?

- a. When data is being sent over the internet and you want it to be sent quickly.
- b. When you are using a wireless connection and not a wired connection.
- c. When data is being sent over the internet which you want to send securely and using encryption.
- d. When data is being sent over the internet and it is not important whether it is sent securely or not.

8. Which of the following describes the term 'drivers'?

- a. A piece of software used to control a piece of hardware, e.g. a peripheral device.
- b. A piece of software stored on the ROM that allows the Operating System to load.
- c. A piece of software which converts the programming code that you have entered into machine code.
- d. The piece of software that is responsible for controlling the Virtual Memory.

9. Which of the following is an embedded system?

- a. Dishwasher.
- b. Smart phone.
- c. Desktop computer.
- d. Game console.

10. Which of the following describes the rate at which data can be transferred across a network?

- a. Transfer speed.
- b. Bandwidth.
- c. Latency.
- d. Download speed.

## Test 10

1. Which of the following is not a purpose/function of the Operating System?
  - a. Manage the peripherals connected to the computer.
  - b. Manage the memory within the computer.
  - c. Provide an interface to interact with the computer.
  - d. Allow you to access the ROM when the computer is loading.
  
2. Why do files become fragmented when saved on a hard-drive?
  - a. Parts of files are deleted by mistake.
  - b. Files become fragmented when they are moved to different folders on the computer.
  - c. Space between existing files is used to store a new file.
  - d. Files are stored as binary and this binary is grouped so can cause fragmentation.
  
3. Which of the following types of software enables the Operating System to control the hardware?
  - a. Device controller.
  - b. Device driver.
  - c. Hardware control.
  - d. Device manager.
  
4. Which of the following is a type of social engineering?
  - a. Malware.
  - b. Phishing.
  - c. Hacking.
  - d. DDOS attack.
  
5. SQL injection is...
  - a. A form of security which will stop hackers from accessing an SQL database.
  - b. A protocol which enables you to send information over the internet.
  - c. A type of program which allows you to store information virtually.
  - d. An attempt to gain access to a database only to manipulate data.

6. Which of the following describes the role of a compiler?
- a. Converts an entire program written in assembly language into machine code.
  - b. Converts an entire program written in a programming language into machine code. A compiler produces this executable program.
  - c. Converts denary and hexadecimal numbers into machine code for the CPU.
  - d. Executes each line of a high-level language program without looking at the entire program. The program is not stored after it has been executed.
7. What type of storage is an SD card?
- a. Magnetic.
  - b. Optical.
  - c. Solid State.
8. Which of the following types of memory is quickest?
- a. Magnetic.
  - b. Optical.
  - c. Cache.
  - d. RAM.
9. Which of the following is a benefit of using a mesh network topology?
- a. Data can be transmitted from different devices simultaneously.
  - b. The network does not use wires, only wireless.
  - c. The network has a server placed at the centre so data is transferred quickly.
  - d. Each device acts as its own server and stores all files on itself.
10. Which of the following does a firewall prevent?
- a. Software on the computer from connecting to the internet without the user knowing.
  - b. Viruses from spreading on a computer.
  - c. Something on the internet from connecting to the computer without the user knowing.
  - d. A user being a victim of phishing.

## II. Exam Style Questions

1. There are many factors that can affect the performance of a processor in a device. Two of these are the number of cores and the cache memory. Describe how increasing either of these can improve the performance of a processor.

(i) Number of Cores.

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[2]

(ii) Cache Memory.

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[2]

2. The Control Unit and Arithmetic Logic Unit (ALU) are both parts of the CPU.

(i) Describe the function of the Control Unit.

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[2]

(ii) Describe the function of the ALU.

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[2]

3. RAM and ROM are both types of memory in a computer. Describe both of these components making reference to their characteristics and role.

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[5]











11. Virtual memory is something which is used in modern computers. Describe the term virtual memory and explain why virtual memory is needed in a modern computer.

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[3]

12. Explain why Secondary Storage is required in addition to RAM in a computer system.

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[3]

13. State three characteristics of Secondary Storage which should be considered when selecting storage for a specific purpose.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

[3]

14. Explain one advantage and one disadvantage of using a star network topology over a start network topology.

**Advantage:**

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\_\_\_\_\_ [2]

**Disadvantage:**

\_\_\_\_\_

\_\_\_\_\_ [2]



### III. Academic Articles

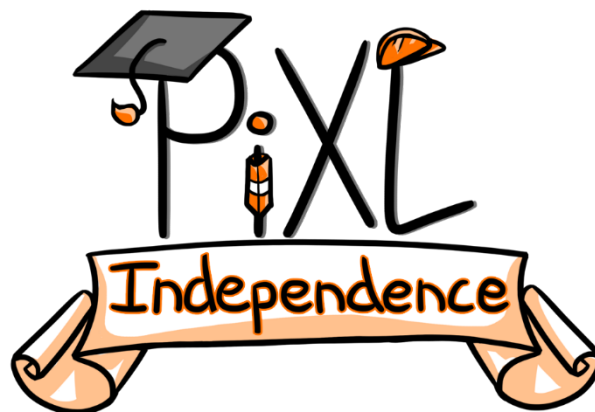
1. <http://mentalfloss.com/article/61764/11-unbelievable-advances-gaming-technology>  
An article discussing the advancements in gaming technology.
2. <https://www.pcmec.com/article/a-cpu-history/>  
An article detailing the history of the CPU.
3. <http://www.nyu.edu/classes/keefer/waoe/miakotkol.pdf>  
A journal discussing the possible impacts of technology on the health of users.
4. <https://www.theatlantic.com/technology/archive/2016/09/the-global-cost-of-electronic-waste/502019/>  
An article discussing the environmental impact of mobile technology.
5. <http://edition.cnn.com/2015/03/11/tech/computer-hacking-history/index.html>  
A news article discussing the crime of hacking.
6. [http://lib.mic.ac.id/perpus/Jurnal/Bynum-2001\\_eit.pdf](http://lib.mic.ac.id/perpus/Jurnal/Bynum-2001_eit.pdf)  
A journal discussing ethics within Computer Science.
7. <https://blog.neweggbusiness.com/storage/is-the-helium-hard-drive-the-future-of-storage/>  
An article discussing developments in magnetic hard-drive technology.
8. [https://support.symantec.com/en\\_US/article.TECH98539.html](https://support.symantec.com/en_US/article.TECH98539.html)  
An article discussing types of computer virus.
9. <http://www.zdnet.com/article/mobile-technology-the-amazing-impact-on-our-lives/>  
An article discussing the impact of technology in our lives.
10. <http://www.independent.co.uk/life-style/gadgets-and-tech/features/google-effect-is-technology-making-us-stupid-10391564.html>  
An article discussing the 'Google effect'.



#### IV. Books for Further Reading

1. **Algorithmic Puzzles** by Anany Levitin  
<https://www.amazon.co.uk/Algorithmic-Puzzles-Anany-Levitin/dp/0199740445>
2. **Once Upon an Algorithm: How Stories Explain Computing** by Martin Erwig  
<https://www.amazon.co.uk/Once-Upon-Algorithm-Stories-Computing/dp/0262036630>
3. **Hackers: Heroes of the Computer Revolution** by Steven Levy  
<https://www.amazon.co.uk/Hackers-Computer-Revolution-Steven-Levy/dp/0141000511>
4. **Lauren Ipsum** by Carlos Bueno  
<https://www.amazon.co.uk/Lauren-Ipsum-Carlos-Bueno/dp/1461178185>
5. **Computational Fairy Tales** by Jeremy Kubica  
<https://www.amazon.co.uk/Computational-Fairy-Tales-Jeremy-Kubica/dp/1477550291>
6. **Alan Turing: The Enigma** by Andrew Hodges  
<https://www.amazon.co.uk/Alan-Turing-Enigma-Andrew-Hodges/dp/0099116413>
7. **But How Do It Know? - The Basic Principles of Computers for Everyone** by J. Clark Scott  
<https://www.amazon.co.uk/But-How-Know-Principles-Computers-ebook/dp/B00F25LEVC>
8. **Best Practices of Spell Design** by Jeremy Kubica  
<https://www.amazon.co.uk/Practices-Spell-Design-Jeremy-Kubica/dp/1481921916>
9. **The Computing Universe: A Journey through a Revolution** by Tony Hey  
<https://www.amazon.co.uk/The-Computing-Universe-Journey-Revolution/dp/0521150183>
10. **The Pattern On The Stone: The Simple Ideas That Make Computers Work** by W. Daniel Hillis

<https://www.amazon.co.uk/Pattern-Stone-Computers-Science-Masters/dp/046502596X>



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