Computing

Lesson 3: Orchestra Conductor

Computer Systems

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[1] *Materials from the Teach Computing Curriculum created by the National Centre for Computing Education*

Task 1 - Scenarios: Images - part 1

Stella often uses her favourite image editing app to edit her photographs of the sky. Use the sentences below to fill in the right-hand column on the next slide, describing what happens behind the scenes as Stella uses the program.

a. Image data is copied from the main memory into storage.
b. Image data is copied from storage (e.g. the hard disk) into the main memory.
c. The program is copied from storage (e.g. the hard disk) into the main memory.
d. Program instructions are fetched one by one from the main memory into the processor, where they are executed.
e. Program instructions are fetched one by one from the main memory into the processor, along with the image data that they will operate on. The instructions are executed and any resulting data is transferred back from the processor into the main memory.

Task 1 - Scenarios: Images

User action What Stella does when using the image editing app	**Behind the scenes** what happens inside Stella's computer (simplified)
Stella starts the image editing app.	1. 2.
She browses through her image files and selects an image to edit.	3.
Stella edits the image, performing several different operations on it. She applies filters, adjusts the colours, retouches details, etc.	4.
Stella saves the edited image back in her files.	5.

Task 1 - Scenarios: Browsing - part 2

When Stella would like to know more about a star or a constellation, she visits the relevant web pages. **Note**: The programs that we use to visit web pages are called browsers. Use the word below to fill in gaps on the next slide

a. Storage – this means any device that can store data and programs persistently, such as a hard disk, a solid-state drive, a flash drive, an SD card, etc.
b. (the) main memory – also referred to as RAM
c. (the) processor – also referred to as the CPU
d. (a) remote computing system – this means using communication components to exchange information

Task 1 - Scenarios: Browsing

User action What Stella does when using app	**Behind the scenes** what happens inside Stella's computer (simplified)
Stella starts the browser.	1. The program is copied from (1) Into (2) 2. Program instructions are fetched one by one from (3) into (4), where they are executed.
She selects a web page that she wants to visit.	1. Web page data is requested and received from a (5). The data is copied into (6) for immediate processing.
Stella reads through the page.	1. Program instructions are fetched one by one from (7) into (8), along with the web page data that they will operate on. The instructions are executed and any resulting data is transferred back from (9) into (10).

Task 2 - Monitoring the system - part 1

A browser is used to visit a website and download a large image. A user takes the following steps.

1. The user starts the browser.
2. The user requests a web page. The page is retrieved from the network and rendered.
3. The user requests a large image. The page is retrieved from the network and displayed.
4. The user terminates the browser.

Task 2 - Monitoring the system - part 2

Which of the steps above would you expect to cause the most significant increase in processor load?

Which of the steps above would you expect to cause the most significant increase in main memory usage?

Which of the steps above would you expect to cause the most significant increase in network activity?