**Week 5 – Homework Problems**

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CPT 301: Computer Organization & Architecture

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December 11, 2023

**Chapter 6  
Exericse 6.1.1**

Here are some daily activities that exploit some form of parallelism. Here are ten daily activities:

* Waking up
* Exercising
* Taking a shower
* Getting dressed
* Eating breakfast
* Brushing teeth
* Commuting to work
* Completing School Work
* Completing Side Job Work
* Studying
* Reading
* Sleeping

Now let's identify which of these activities are already exploiting some form of parallelism:

1. **Exercising:** Can be combined with listening to music or audiobooks.
2. **Taking a shower:** Brushing teeth can be done while in the shower.
3. **Eating breakfast:** Can be done while reading the news or checking morning emails.

**Exericse 6.1.2**

Here are some activities that could be paired with one another:

1. **Waking up:** Can be paired with planning the day or meditating to set intentions for the day.
2. **Getting dressed:** Can be paired with listening to a podcast or a news briefing.
3. **Commuting to work**: Can be utilized for more audiobooks.
4. **Completing School Work:** Can be paired with listening to educational material relevant to the subject.
5. **Completing Side Job Work:** Depending on the nature of the work, it could be paired with more audidobooks.
6. **Studying:** Can be paired with instrumental music to improve focus.
7. **Reading:** Can be paired with audio transcription to take notes simultaneously.
8. **Sleeping:** Can be paired with playing white noise or sleep stories to improve sleep quality.

**Exericse 6.1.3**

For changes that could allow more parallel tasks:

1. **Gym Equipment:** Could have integrated learning systems for language learning or watching educational videos while exercising.
2. **Shower Systems:** Could be equipped with waterproof screens or speakers for news, learning languages, or listening to podcasts.
3. **Smart Clothing:** Could monitor vital signs and automatically record health data during the day, eliminating the need to use separate health tracking devices.
4. **Breakfast Appliances:** Smart kitchen devices that can prepare breakfast automatically, freeing up time for other morning routines.
5. **Transportation:** Autonomous cars or public transport with Wi-Fi could allow for completing work or study tasks while commuting.
6. **Digital Note-Taking Devices:** Can transcribe notes taken during reading sessions, reducing the effort needed to convert hand-written notes to digital format.
7. **Smart Beds:** Can monitor sleep patterns and adjust conditions for optimal sleep, as well as wake you up gently at the optimal sleep phase.

These considerations aim to find ways to efficiently use time by doubling up on activities that are less demanding cognitively or physically, allowing for productivity improvements in everyday life.

**Exericse 6.1.4**

Assuming the following time allocations for each task when done sequentially:

* Waking up: 5 minutes
* Exercising: 30 minutes
* Taking a shower: 15 minutes
* Getting dressed: 10 minutes
* Eating breakfast: 20 minutes
* Brushing teeth: 5 minutes
* Commuting to work: 30 minutes
* Completing School Work: 120 minutes
* Completing Side Job Work: 120 minutes
* Studying: 60 minutes
* Reading: 30 minutes
* Sleeping: 480 minutes (8 hours)

Total time if done sequentially: 925 minutes (15 hours and 25 minutes, not including Sleeping).

Now, let’s consider the parallel activities:

1. **Exercising (30 minutes) with Listening to an audiobook (Previously Studying: 60 minutes):** Assuming the audiobook is related to the study material, we can reduce the studying time by half since it's being combined with exercising.
2. **Taking a shower (15 minutes) with Brushing teeth (5 minutes):** These can be done simultaneously, saving 5 minutes.
3. **Eating breakfast (20 minutes) with Reading (30 minutes):** Reading can be done during breakfast, saving 20 minutes.
4. **Commuting to work (30 minutes) can be used to complete some School Work (previously 120 minutes):** Assuming an efficient use of this time, we might reasonably expect to complete 30 minutes of school work.
5. **Completing Side Job Work (120 minutes) can be paired with background Listening to news or podcasts (Previously done during breakfast or commuting):** This doesn't necessarily save time on side job work, but it does incorporate another task that might otherwise take an additional 30 minutes.

If we adjust the times for parallel activities:

1. **Exercising + Studying via audiobook:** 30 minutes (saving 30 minutes of studying)
2. **Taking a shower + Brushing teeth:** 15 minutes (saving 5 minutes)
3. **Eating breakfast + Reading:** 20 minutes (saving 20 minutes)
4. **Commuting + School Work:** 30 minutes (counting as 30 minutes of school work done)
5. **Completing Side Job Work + Listening to news/podcasts:** 120 minutes (incorporating another activity)

Now, let’s calculate the total time saved. We initially had a total active time (excluding sleeping) of 445 minutes. If we subtract the time saved by multitasking (30+5+20+30), we get 360 minutes. So, we’ve saved 85 minutes from the active tasks by multitasking.

The total time for all activities, including sleeping, was initially 925 minutes. With the saved time, it becomes 840 minutes (925 - 85), so the activities would take 14 hours in total, including sleep. This represents a saving of 1 hour and 25 minutes in the active waking day by multitasking where possible.