Assignment 7 - Embedded Systems

Due Mar 22 at 6pm **Points** 12 **Questions** 7
Available Mar 15 at 8:45pm - Mar 22 at 6pm **Time Limit** None
Allowed Attempts Unlimited

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Attempt History

	Attempt	Time	Score
KEPT	Attempt 6	2 minutes	9 out of 12 *
LATEST	Attempt 6	2 minutes	9 out of 12 *
	Attempt 5	1 minute	7 out of 12 *
	Attempt 4	less than 1 minute	7 out of 12 *
	Attempt 3	less than 1 minute	7 out of 12 *
	Attempt 2	1 minute	6 out of 12 *
	Attempt 1	39 minutes	7 out of 12 *

* Some questions not yet graded

ⓘ Correct answers are hidden.

Score for this attempt: **9** out of 12 *
Submitted Mar 20 at 6:59pm
This attempt took 2 minutes.

Question 1 — Not yet graded / 3 pts

List SIX examples of devices that typically include embedded computer systems.

Your Answer:

Below are the 6 examples of devices that typically include embedded computer systems.

1. Home appliances: Embedded computer systems are now commonplace in many home appliances like refrigerators, ovens, and washing machines, enabling them to monitor and regulate their functions. These systems are equipped with sensors that can detect malfunctions and notify users of any issues, while their software is designed to optimize energy usage and minimize expenses. Additionally, several home appliances offer connectivity features such as Wi-Fi or Bluetooth, enabling users to operate them remotely.

2. Smartphones: Modern smartphones are equipped with embedded computer systems comprising processors, memory, and software, which empower them to execute various functions such as making calls, sending texts, browsing the internet, and running a diverse range of applications. Moreover, these systems facilitate the smartphones to communicate with other devices, such as smartwatches or home automation systems, and interoperate with them.

3. Medical devices: Embedded computer systems have become integral components of several medical devices, including insulin pumps, pacemakers, and blood glucose monitors, enabling them to monitor patients' health and deliver treatments. These systems are equipped with sensors that can identify any variations in vital signs, while their software is designed to scrutinize the data and regulate the treatment settings. Furthermore, some of these devices feature connectivity options that allow doctors to supervise their patients' health remotely.

4. Automotive systems: Modern automobiles incorporate embedded computer systems, which regulate multiple aspects of the vehicle ranging from the engine and transmission to the entertainment and navigation systems. Equipped with sensors, these systems oversee the performance of the vehicle and notify drivers of any potential issues. Furthermore, the software installed in these systems can fine-tune various settings such as speed or suspension to enhance the car's overall performance and fuel efficiency.

5. Industrial control systems: Embedded computer systems are essential components in numerous industrial systems, including manufacturing equipment and process control systems, as they facilitate the management of operations and improve overall performance. These systems comprise sensors that scrutinize various aspects of the system,

while the software installed can analyze the data and adjust the settings accordingly. Furthermore, many of these systems feature connectivity options that enable operators to control the system remotely.

6. Smart home devices: An increasing number of smart home devices, including lighting systems, thermostats, and security systems, are now equipped with embedded computer systems that can be operated via voice assistants or smartphone apps. These systems come equipped with sensors that can detect changes in the environment, such as temperature or motion, and their software can analyze the data and adjust settings accordingly. Furthermore, most of these systems feature connectivity options that enable users to manage the devices remotely.

Question 2

3 / 3 pts

Which of these are among the earliest examples of embedded system applications (1960s)?

- [x] Automobile fuel injection system
- [ ] Automated factory controller
- [ ] Self-driving automobile
- [x] Missile flight control system
- [ ] Aircraft auto-pilot
- [x] Spacecraft flight control system

Question 3

1 / 1 pts

Which os these would usually **not** be true of an embedded system?

- Small physical size
- [x] High speed processor
- No disk
- Limited memory

Question 4

1 / 1 pts

Debugging embedded system software:

- Requires specialized hardware
- Can only be done for certain commonly available languages
- Requires an extended version of the embedded system
- [x] Is often done with a debugger hosted on a traditional computer

Question 5

1 / 1 pts

Which of these system software services is frequently included on an embedded system:

- FTP server
- Debugger
- Database
- [x] Web server

Question 6

1 / 1 pts

Real Time Operating Systems (RTOS):

- ○ Require a large amount of processing power
- ○ Were first developed at NASA in the mid-1980s
- ◉ Guarantee a response to inputs in a fixed amount of time
- ○ Cannot be built on a traditional general-purpose computer

Question 7

2 / 2 pts

The two types of Real Time Operating System are:

- ☑ Continuous
- ☐ High Performance
- ☐ Discrete
- ☐ Low Performance
- ☑ Asynchronous
- ☐ Virtual

Quiz Score: **9** out of 12