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C++ Introduction

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Chapter 1: Computers, People, and Programming Exercises

1. **Pick an activity you do most days (such as going to class, eating dinner, or watching television). Make a list of ways computers are directly or indirectly involved.**

Going to work- there are computers in the ECU of my car’s engine, computers in the Bluetooth radio, and the computers used to design and model my car.

2**. Pick a profession, preferably one that you have some interest in or some knowledge of. Make a list of activities done by people in that profession that involve computers.**

Engineering- using modeling and simulation to iterate an engineering design, creating engineering drawings using software, and analyzing data using software.

3. **Swap your list from exercise 2 with a friend who picked a different profession and improve his or her list. When you have both done that, compare your results. Remember: There is no perfect solution to an open-ended exercise; improvements are always possible**.

Data science- similar results with analyzing data using software. Going to work meetings via Teams, software in the databases, collecting the data, analyzing it.

4. **From your own experience, describe an activity that would not have been possible without computers.**

Flying to see my grandparents in Florida. My ticket was completely virtual, the computers that make the airplane fly, and the computers involved in getting my luggage to me.

5. **Make a list of programs (software applications) that you have directly used. List only examples where you obviously interact with a program (such as when selecting a new song on an MP3 player) and not cases where there just might happen to be a computer involved (such as turning the steering wheel of your car).**

Solidworks, Teams, Outlook, Spotify, Vagrant, and Word.

6. **Make a list of ten activities that people do that do not involve computers in any way, even indirectly. This may be harder than you think!**

Sunbathing, walking, breathing/meditation, sleeping, swimming, stretching, talking with friends, making snowmen, making a bonfire, and watching the sunset.

7. **Identify five tasks for which computers are not used today, but for which you think they will be used at some time in the future. Write a few sentences to elaborate on each one that you choose.**

1. Quality assurance- computers today cannot check for imperfections in manufactured goods, but with the rise of CVML I think they could.

2. Writing essays/doing homework- Students today write their essays or homework on their own, but I think applications like ChatGPT will change how we assign and do assignments in the future.

3. Artwork- artist today are human and create artwork through their own skillset, but I think AI will be able to take prompts from humans to create art from it.

4. Shaving- with the rise in popularity and the cheapening of materials/mass production, I think laser hair removal will become more popular.

5. Delivery people- drones will become a lot cheaper and easier to navigate and I think it will take over the delivery industry.

8. **Write an explanation (at least 100 words, but fewer than 500) of why you would like to be a computer programmer. If, on the other hand, you are convinced that you would not like to be a programmer, explain that. In either case, present well-thought-out, logical arguments.**

I would like to become a programmer because I find fulfillment in being able to write a piece of code and seeing it act out on a vehicle. Furthermore, I think tech is a growing industry and it is important to have skills that can complement that. In addition, in a world that is ever growing closer with computers it is important to at least become literate about what code does and how it works with hardware. Finally, I would like to become a programmer because I joined a robotics group during my senior year of college and I would like to be able to understand all roles, software, electrical, and mechanical.

9. **Write an explanation (at least 100 words, but fewer than 500) of what role other than programmer you’d like to play in the computer industry (independently of whether “programmer” is your first choice).**

I think doing software tests would be a fun job. Doing software test is taking software that a developer coded and running it either on the machine or in a simulation to try to break it. This lets the developer iterate on their code and prevents the consumer from breaking the product and potentially getting hurt.

**10. Do you think computers will ever develop to be conscious, thinking beings, capable of competing with humans? Write a short paragraph (at least 100 words) supporting your position.**

I think that it is possible to have a computer become conscious enough to make decisions, but not to the level that humans have. Human consciousness is comprised of both logic and emotion; while computers can only have logic. Emotion is so heavily dependent on how the individual processes events and is so unique to each person and situation. In addition, emotion is a biological process. It is the result of chemicals firing off in the brain and is given from birth. Whereas with computers we would have to create an input for machines to learn from, but as I said the human emotion is unique to each individual so the computer would most likely just be mimicking the programmer who made it.

11**. List some characteristics that most successful programmers share. Then list some characteristics that programmers are popularly assumed to have**.

Successful programmers- good communication, diverse background, open to learning, perseverance, and detail oriented.

Popularly assumed- introverted, only know how to code and have been coding from birth, prestigious educational background, and can do everything right the first time.

12. **Identify at least five kinds of applications for computer programs mentioned in this chapter and pick the one that you find the most interesting and that you would most likely want to participate in someday. Write a short paragraph (at least 100 words) explaining why you chose the one you did**.

I think embedded software would be where I would want to be because I have a mechanical engineering background and I have an interest in taking software and having it be able to do things and move. It complements my degree the most because I think to write code for a machine it would make sense to have a person who understands the ins and outs of a vehicle write the code that will control these mechanical features. Finally, I have previously used an Arduino for my undergraduate classes, and I know I enjoy working with embedded software.

13. **How much memory would it take to store (a) this page of text, (b) this chapter, (c) all of Shakespeare’s work? Assume one byte of memory holds one character and just try to be precise to about 20%.**

1. 500 bytes

2. 1000 bytes

3. 884, 647 bytes

14. **How much memory does your computer have? Main memory? Disk?**

1. RAM = 16 GB

2. Main memory = 117.8 GB

3. Disk = 931 GB