

**CSC 1100 – Problem Solving and Programming**  
**Homework 1 – Trevor Trusty**  
**25 points – Due January 17, 11am**

1) [4 points] Using information from the Internet or a textbook, list four trends in the future of computing. Include your sources in the form of hyperlinks or book citations.

#	Trend	Source
1	Larger scale implementation of conversational/voice Artificial Intelligence for tasks at home, work, etc.	<a href="https://www.forbes.com/sites/forbestechcouncil/2016/12/27/upcoming-technology-10-trends-to-watch-in-the-next-five-years/#7ec27eab2fd1">https://www.forbes.com/sites/forbestechcouncil/2016/12/27/upcoming-technology-10-trends-to-watch-in-the-next-five-years/#7ec27eab2fd1</a>
2	Because of all of the services most of us use that contribute to machine learning, by 2020 AI will no longer need us to “aid its learning”	<a href="https://appinventiv.com/blog/10-tech-trends-that-will-become-mainstream-by-2020">https://appinventiv.com/blog/10-tech-trends-that-will-become-mainstream-by-2020</a>
3	The 5 <sup>th</sup> gen. of cellular network technology will appear by 2020 with improvements over today’s 4g connection, such as the latency and speed.	<a href="https://appinventiv.com/blog/10-tech-trends-that-will-become-mainstream-by-2020">https://appinventiv.com/blog/10-tech-trends-that-will-become-mainstream-by-2020</a>
4	WEB 3.0, technology where our data would be directly readable by the computer.	<a href="https://hackernoon.com/future-technology-trends-that-gonna-rule-the-planet-fa2f578f22eb">https://hackernoon.com/future-technology-trends-that-gonna-rule-the-planet-fa2f578f22eb</a>

2) [5 points] Using information from a smartphone vendor (like Apple, Samsung, LG, ZTE, etc.), choose one of their products and list specifications for the following features.

Source (hyperlink): <https://www.samsung.com/us/mobile/phones/galaxy-note/galaxy-note9-128gb--unlocked--sm-n960uzkaxaa/>

Vendor: Samsung\_\_\_\_\_

Product: Galaxy Note9 128GB (Unlocked)\_\_\_\_\_

Feature	Specification
CPU	2.8 GHz, 1.7 GHz
Memory size	6GB RAM
Storage medium and size	128GB (ROM), and microSD support up to 512GB
Operating system	Android 8.1
Price	\$999.99

3) [10 points] Convert the following numbers. Show your work for each conversion.

$$\begin{array}{r} 2^3 \quad 2^2 \quad 2^1 \quad 2^0 \\ 1 \quad 0 \quad 1 \quad 1 \\ \hline 8 + 0 + 2 + 1 = 11 \end{array}$$

a) Binary 1011 to decimal

(11)

b) Binary 110001 to decimal

(49)

c) Decimal 55 to binary

(111011)

d) Decimal 115 to binary

(1110111)

$$\begin{array}{r} 2^5 \quad 2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 2^0 \\ \times \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \\ \hline 32 \quad 16 \quad 0 \quad 0 \quad 0 \quad 1 \\ \hline \text{Sum} = 49 \end{array}$$

4) [4 points] Using the UNICODE charts available at [unicode-table.com/en/](http://unicode-table.com/en/), list the characters and corresponding UNICODE numbers of the name of your favorite town or city. List one character and UNICODE number per row in the following table.

#	Character	UNICODE number (U+HHHH)
1	C	U+0043
2	H	U+0068
3	I	U+0069
4	C	U+0063
5	A	U+0061
6	G	U+0067
7	O	U+006F

5) [2 points] How many bits would you need to represent 32 different values? Show your calculation.

Bits: \_\_\_\_\_5\_\_\_\_\_

$$\log_2(32) = 5$$