

# Software Development

Unit 1 – Software Development Concepts Presentations

Name \_\_\_\_\_

## 01 Binary Numbers - Video

1. The number “1” represents the \_\_\_\_\_ electric signal.
2. The number “0” represents the \_\_\_\_\_ electric signal.
3. The place values for the first four places in a binary number are  
\_\_\_\_\_

4. What are the following binary numbers?

0000 _____	0101 _____	1010 _____
0001 _____	0110 _____	1011 _____
0010 _____	0111 _____	1100 _____
0011 _____	1000 _____	1101 _____
0100 _____	1001 _____	1110 _____
		1111 _____

5. What is the largest number you can make with a four-bit number? \_\_\_\_\_
6. What are these binary numbers?

10010 _____	10101 _____	11010 _____
10001 _____	00010 _____	11011 _____

7. Write these decimal numbers in binary

6 _____	15 _____	31 _____
7 _____	16 _____	32 _____

8. What is the ASCII number for the character “A”? \_\_\_\_\_

## 02 How a CPU works

1. What does CPU stand for? \_\_\_\_\_
2. Who are two manufacturers of CPUs? \_\_\_\_\_
3. Where does the CPU store its working memory? \_\_\_\_\_
4. In what form does a computer store data? \_\_\_\_\_
5. What does ALU stand for? \_\_\_\_\_
6. Name the three parts of a CPU: \_\_\_\_\_
7. What part of the CPU can add two numbers? \_\_\_\_\_
8. What is stored inside the Program Memory? \_\_\_\_\_
9. What does RAM stand for? \_\_\_\_\_
10. RAM consists of two lists of numbers:  
\_\_\_\_\_ and \_\_\_\_\_
11. What are eight of the instructions that the CPU can do?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
12. How does the computer know what to do? \_\_\_\_\_
13. Where do numbers need to be so we can add them in the ALU? \_\_\_\_\_
14. What is a specific location in RAM called? \_\_\_\_\_
15. How do we tell the computer to move the numbers from RAM to the registers? \_\_\_\_\_
16. How do we tell the computer to add two numbers? \_\_\_\_\_
17. What happens to the data in RAM when the power is shut off? \_\_\_\_\_
18. Where is data stored when the computer is powered off?  
\_\_\_\_\_

## 03 Programming Languages

1. What is a programming language? \_\_\_\_\_
2. What are four names of common languages? \_\_\_\_\_
3. What is the lowest level of programming? \_\_\_\_\_
4. What is the language of CPU instructions? \_\_\_\_\_
5. What does the process of compiling do? \_\_\_\_\_

6. What was the first compiled high-level language? \_\_\_\_\_
7. What is the main advantage of a bytecode language like Java that runs on a virtual machine? \_\_\_\_\_  
\_\_\_\_\_
8. Name three advantages of an interpreted language \_\_\_\_\_  
\_\_\_\_\_
9. Name three advantages of a compiled language \_\_\_\_\_  
\_\_\_\_\_
10. Why was the visual programming method invented? \_\_\_\_\_  
\_\_\_\_\_
11. What is HTML/CSS used for? \_\_\_\_\_
12. What is SQL used for? \_\_\_\_\_
13. What is XML used for? \_\_\_\_\_
14. What is JSON used for? \_\_\_\_\_

#### **04 Types of Programming Languages**

1. What languages can be used to create a Windows PC application? \_\_\_\_\_
2. What languages can be used to create a Macintosh application? \_\_\_\_\_
3. What languages can be used to create a Web-based application? \_\_\_\_\_
4. What languages can be used to create a Windows PC application? \_\_\_\_\_
5. What languages can be used to create an Android application? \_\_\_\_\_
6. What languages can be used to create an iPhone or iPad application? \_\_\_\_\_
7. Increasingly, what is JavaScript being used to build? \_\_\_\_\_
8. What languages can be used to create a server back-end application? \_\_\_\_\_
9. What languages can be used to create an embedded application? \_\_\_\_\_

#### **05 Software Licensing**

1. What category of software would you classify these programs?  
Microsoft Excel \_\_\_\_\_  
Adobe Photoshop \_\_\_\_\_  
Firefox \_\_\_\_\_
2. What free alternatives exist for these programs?  
  
Microsoft Windows \_\_\_\_\_  
Microsoft Office \_\_\_\_\_  
Adobe Photoshop \_\_\_\_\_  
Adobe Illustrator \_\_\_\_\_
3. Why would someone pay for commercial software when there are free alternatives? \_\_\_\_\_

#### **06 Software Life Cycle**

What are the six phases of software development?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

What types of testing do these describe?

1. \_\_\_\_\_ Test to see that the software performs without errors.
2. \_\_\_\_\_ Test to see that users can use the product without confusion.
3. \_\_\_\_\_ Test to see that the system works well with many users.
4. \_\_\_\_\_ Test to see that the product can avoid malicious attacks and bad data.
5. \_\_\_\_\_ Test to see that the product works on various computers and environments.

## 07 IT Careers

Four common IT careers include

- i. \_\_\_\_\_
- ii. \_\_\_\_\_
- iii. \_\_\_\_\_
- iv. \_\_\_\_\_
- v. Which career track would lead you to do each of these activities?
  - a. Manage a server \_\_\_\_\_
  - b. Program an operating system \_\_\_\_\_
  - c. Develop a social media app \_\_\_\_\_
  - d. Defend a network from attacks \_\_\_\_\_

Use the following link

- <http://www.bls.gov/ooh/computer-and-information-technology/home.htm>
- Compare four careers and fill in the following table:

Career	Salary Range	Amount of Education Needed	Number of Jobs in USA	Job Growth % Estimate
Computer Support Specialist				
Web Developer				
Computer Systems Analyst				
Database Admin				

## College Career Exercise

Choose two of the programs of study below and make a list of required classes in the table

Web and Graphic Design

<https://aztransmac2.asu.edu/cgi-bin/WebObjects/acres.woa/wa/freeForm3?id=63317>

Programming and Mobile Development

<https://aztransmac2.asu.edu/cgi-bin/WebObjects/acres.woa/wa/freeForm3?id=83468>

Computer Programming

<https://aztransmac2.asu.edu/cgi-bin/WebObjects/acres.woa/wa/freeForm3?id=26042>

Computer and Network Technology

<https://aztransmac2.asu.edu/cgi-bin/WebObjects/acres.woa/wa/freeForm3?id=47189>

Database Development

<https://aztransmac2.asu.edu/cgi-bin/WebObjects/acres.woa/wa/freeForm?id=24226>

1.	2.
Required core classes...	Required core classes...

--	--

- Which degree looks easiest? \_\_\_\_\_
- Which degree looks more interesting to you? \_\_\_\_\_

### 08 Security and Encryption

1. The symbol in the URL that tells you the computer is using encryption is \_\_\_\_\_
2. What does VPN mean? \_\_\_\_\_
3. A \_\_\_\_\_ is a program that checks packet source and destination before allowing them in or out of a computer.
4. A \_\_\_\_\_ makes internet requests for clients, hiding the IP address of the client.
5. A \_\_\_\_\_ is when a user executes unauthorized database code.
6. \_\_\_\_\_ should not be permitted input for general purpose data forms on a web page.
7. Passwords more than \_\_\_\_\_ letters are considered secure.

### Password Cracking Exercise

Complete the password cracking 101 page at

[http://www.studyoffice.org/index.php?option=com\\_content&view=article&id=33:password-cracking-101&catid=19&Itemid=187](http://www.studyoffice.org/index.php?option=com_content&view=article&id=33:password-cracking-101&catid=19&Itemid=187)

8. How much time did the computer take to crack each of these password lengths?
  - a. 5 characters \_\_\_\_\_
  - b. 6 characters \_\_\_\_\_

- c. 7 characters \_\_\_\_\_
- d. 8 characters \_\_\_\_\_

### 09 IBM Century of Innovation

<https://www.youtube.com/watch?v=39jtNUGgmd4>

IBM is one of the oldest technology companies in the world. It has experienced more technology changes than any other. Here are some highlights from the video:

1. 1915 Who is the company president? \_\_\_\_\_
2. 1931 What was the main method for storing data? \_\_\_\_\_
3. 1936 What government project did IBM implement? \_\_\_\_\_
4. 1940 What electronic device is used? \_\_\_\_\_
5. 1948 What could the Selective Sequence Electronic Calculator do for the first time? \_\_\_\_\_
6. 1957 What programming language was invented? \_\_\_\_\_
7. 1962 What did the SABRE system do? \_\_\_\_\_
8. 1963 What system did IBM create as the largest corporate research project to date? \_\_\_\_\_
9. 1966 What memory device was invented? \_\_\_\_\_
10. 1969 What government project did IBM help with? \_\_\_\_\_
11. 1972 What consumer device was invented? \_\_\_\_\_
12. 1973 What consumer device was invented? \_\_\_\_\_
13. 1976 What consumer device was invented? \_\_\_\_\_
14. 1981 What consumer device was invented? \_\_\_\_\_