Erasmus+
Living and learning between books and bytes

If you want your results afterwards, write your country here:_____

You have 60 min i total to complete this test, please make sure that you have time to answer all questions of the three topics.

Computational Thinking

What learning session did you participate in?

Books (Apple) ___ Books and bytes (Banana) ___ Bytes (Mango)___

1. *A binary number (base 2) is written 1010.*
Which number (base 10) is it?

A. 5. ▢ ___/2
B. 6. ▢ ___/2
C. 10. ▢ ___/2
D. 14. ▢ ___/2

2. *The number 13 is written as a binary number (base 2).*
Which of the following binary numbers is equal to 13?

A. 1110. ▢ ___/2
B. 1011. ▢ ___/2
C. 1101. ▢ ___/2
D. 1001. ▢ ___/2

3. *ASCII is a character-encoding scheme that uses a numeric value to represent each character. For example, the uppercase letter "A" is represented by the decimal (base 10) value 65. ASCII characters can also be represented by binary numbers. Which of the following binary number represents the letter "A"?*

A. 1000000. ▢ ___/2
B. 1000010. ▢ ___/2
C. 1000001. ▢ ___/2
D. 1100000. ▢ ___/2

4. *A video-streaming Web site uses 32-bit integers to count the number of times each video has been played. In anticipation of some videos being played more times than can be represented with 32 bits, the Web site is planning to change to 64-bit integers for the counter.*

Which of the following best describes the result of using 64-bit integers instead of 32-bit integers?

A. 2 times as many values can be represented. ▢ ___/2

B. 32 times as many values can be represented. ▢ ___/2

C. 2^{32} times as many values can be represented. ▢ ___/2

D. 32^2 times as many values can be represented. ▢ ___/2

5. *A programmer completes the user manual for a video game she has developed and realizes she has reversed the roles of goats og sheep throughout the text. Consider the programmer's goal of changing all occurrences of "goat" to "sheep" and all occurrences of "sheep" to "goats". The programmer will use the fact that the word "foxes" does not appear anywhere in the original text.*

Which of the following algorithms can be used to accomplish the programmer's goal?

A. First, change all occurrences of "goats" to "sheep". ▢ ___/2
Then, change all occurrences of "sheep" to "goats".

B. First, change all occurrences of "goats" to "sheep". ▢ ___/2
Then, change all occurrences of "sheep" to "goats".
Then, change all occurrences of "foxes" to "sheep".

C. First, change all occurrences of "goats" to "foxes". ▢ ___/2
Then, change all occurrences of "sheep" to "goats".
Then, change all occurrences of "foxes" to "sheep".

D. First, change all occurrences of "goats" to "foxes". ▢ ___/2
Then, change all occurrences of "foxes" to "sheep".
Then, change all occurrences of "sheep" to "goats".

6. *The table below shows the time a computer system takes to complete a specified task on the customer data of different-sized companies.*

Task	**Small Company (approximately 100 customers)**	**Medium Company (approximately 1000 customers)**	**Large Company (approximately 10000 customers)**
Backing up data	2 hours	20 hours	200 hours
Deleting entries from data	100 hours	200 hours	300 hours
Searching through data	250 hours	300 hours	350 hours
Sorting data	0,01 hour	1 hour	100 hours

Based on the information in the table, which of the following tasks is likely to take the longest amount of time when scaled up for a very large company of approximately 100000 customers?

A. Backing up data. ▢ ___/2
B. Deleting entries from data. ▢ ___/2
C. Searching through data. ▢ ___/2
D. Sorting data. ▢ ___/2

7. *You are supposed to guess a number between 0 and 10.*
If you are guessing randomly (linear search), how many guesses can be necessary?

A. 1 ▢ ___/2
B. 5 ▢ ___/2
C. 11 ▢ ___/2

If you are searching by successively eliminating half of the numbers (binary search), how many guesses can be necessary?

A. 4 ▢ ___/2
B. 5 ▢ ___/2
C. 6 ▢ ___/2

8. *There are 32 students standing in a classroom. Two different algorithms are given for finding the average height of the students.*

Algorithm A

Step 1: All students stand.
Step 2: A randomly selected student writes his or her height on a card and is seated.
Step 3: A randomly selected student standing adds his or her height to the value on card, records the new value on the card, and is seated. The previous value on the card is erased.
Step 4: Repeat step 3 until no students remain standing.
Step 5: The sum on the card is divided by 32. The result is the average height of the students.

Algorithm B

Step 1: All students stand.
Step 2: Each student is given a card. Each student writes his or her height on the card.
Step 3: Standing students form random pairs at the same time. Each pair adds their numbers written on their cards and writes the result on one student´s card; the other is seated. The previous value on the card is erased.
Step 4: Repeat step 3 until one student remains standing.
Step 5: The sum on the card is divided by 32. The result is the average height of the students.

Which of the following statements is true?

A. Algorithm A is faster than algorithm B. ▢ ___/2
B. Algorithm B is faster than algorithm A. ▢ ___/2
C. The two algorithms are equally fast. ▢ ___/2

9. *Write a recipe for a sandwich, thinking carefully about each step that needs to be carried out.*

(You can answer in your mother tongue, if you find it too difficult to express your knowledge in english)

8 (excellent) develops the topic fully

6 (good) makes reference to some key elements

4 (acceptable) makes reference to one key element

2 (poor) shows no understanding of the topic

Digital evolution

What learning session did you participate in?

Books (Banana) ___ Books and bytes (Mango) ___ Bytes (Apple)___

1. *Which of the following can be defined as a technological revolution?*

A. The invention of the Wheel plough. ▢ ___/2
B. The invention of the first Android Smartphone. ▢ ___/2
C. The invention of the 22 mm painters brush. ▢ ___/2
D. The invention of the first espresso machine. ▢ ___/2

2. *What is the definition of an analog computer?*

A. An electronic mechanical machine, that can make simple calculations. ▢ ___/2
B. A mechanical machine, that copy a text. ▢ ___/2
C. A mechanical machine, that can make simple calculations. ▢ ___/2
D. An electronic machine, that can perform mechanical calculations. ▢ ___/2

3 *The co-founder of Intel Gordon Moore made a prediction in 1965 that the number of transistor would rize at a certain rate every 1-2 years. Afterwards it has been described as Moore's law. What is the correct rate.*

A. 50% more every 1-2 years ▢ ___/2
B. Double every 6 months ▢ ___/2
C. Four times as many every ▢ ___/2
D. Double every 1-2 years ▢ ___/2

4. *The basic hardware of a computer consists of the following;* Monitor, Motherboard, CPU, RAM, Expansion cards, Power supply unit, Optical disc drive, Hard disk drive (HDD), Keyboard, Mouse.

What is the main thinking part of the computer?

A. Hard disk drive (HDD) ▢ ___/2
B. Motherboard ▢ ___/2
C. CPU ▢ ___/2
D. RAM ▢ ___/2

5. *What company produced the PC-DOS (operating system) to the IBM personal computer with the Intel 8088 processor?*

A. IBM ▢ ___/2
B. Linux ▢ ___/2
C. Hewlett-Packard ▢ ___/2
D. Microsoft ▢ ___/2

6. *Who was/were the founder(s) of Apple? (Choose one or more)*

A. Stephen G. Wozniak ▢ ___/1
B. Gill Gates ▢ ___/1
C. Piotr G Wozniak ▢ ___/1
D. Steven P. Jobs ▢ ___/1

7. *In 1981 Lee Felsenstein invented a new thing. Soon after some companies began to produce and sell it. The first example weight around 9 kilo. What was it?*

A. The first handheld computer. ▢ ___/2
B. The first battery driven printer. ▢ ___/2
C. The first handheld mobile phone. ▢ ___/2
D. The first battery driven monitor. ▢ ___/2

8. *In 1969 the first network between computers situated at different addresses came to life as ARPANET, next step of the progress towards the internet was i 1980 were CSNET came in to life, but it was not until 1991 that World Wide Web became a reality. What organization(s) was in charge of that?*

A. NASA ▢ ___/2
B. British, french and american universities ▢ ___/2
C. US Government ▢ ___/2
D. CERN ▢ ___/2

9. *Describe and discuss the current challenges and opportunities with the existence of the internet and in particular Google search.*

(You can answer in your mother tongue, if you find it too difficult to express your knowledge in english)

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European norms and standards

What learning session did you participate in?

Books (Mango) ___ Books and bytes (Apple) ___ Bytes (Banana)___

1. *What is the purpose of the European Union?*
(Mark the answer that is closest to the ideal)

A. Peace between and wealth in the member states. ▢ ___/2
B. To standardize the lives of all European citizens. ▢ ___/2
C. To defend against American cultural influence. ▢ ___/2
D. To argue and disagree in an organized forum. ▢ ___/2

2. *What is the European single marked?*
(Mark the answer that is closest to reality)

A. An area where only EU goods are allowed to be sold. ▢ ___/2
B. A website where lonely middle-aged Europeans can find love. ▢ ___/2
C. A free trade area between two EU-countries ▢ ___/2
D. A free trade area covering all EU member states. ▢ ___/2

3. *What types of transactions and/or movements does the European single marked cover?*
(Mark the answer that is closest the ideal)

A. Transactions involving goods ▢ ___/2
B. Transactions involving goods and services ▢ ___/2
C. Transactions involving services ▢ ___/2
D. Free movement of people ▢ ___/2
E. Free movement of capital ▢ ___/2
F. All the above-mentioned transactions ▢ ___/2

4. *Why is it an ideal for the EU to create European standards for all goods and services?*
(Mark the answer that is closest the ideal)

A. To irritate European producers and consumers as much as possible. ▢ ___/2
B. To eliminate all barriers to trade within the EU. ▢ ___/2
C. To protect the integrity of products labeled “made in the EU”. ▢ ___/2

5. *How does European norms and standards effect the ordinary peoples of Europe? (Mark the answer that is closest to reality)*

A. They don't really have any everyday effect on ordinary people. ▢ ___/2
B. They effect almost all aspects of daily lives in the EU. ▢ ___/2
C. They affect many aspects of daily lives, but you can easily get by without being effected personally. ▢ ___/2

6. *What is an example of a European standard? (Mark the answer or answers that is closest to the ideal)*

A. Minimum sizes for apples. ▢ ___/1
B. Dimensions and efficiency of side mirrors on trucks. ▢ ___/1
C. A list of chemicals that can be used in products like shampoo or soap. ▢ ___/1
D. Rules for the security at worksites. ▢ ___/1
E. Grading systems in European national school-systems. ▢ ___/1
F. Common standards for flight security. ▢ ___/1

7. *What are the potential challenges for the future of the regime of European norms and standards?*

Give examples:

(You can answer in your mother tongue, if you find it too difficult to express your knowledge in english)

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