AP
Computer Science Principles
Summer Assignment
2018

Student Name

Google Classroom Code
bdnusmv
Dear Students,

We are looking forward to see you being a part of a whole new world, called “Computer Science.” In this course students will learn how to think like a computer scientist, how to solve problems by breaking them into smaller parts, how to design new programs on your own or in a team, how to analyze problems by differentiating between abstract and concrete, how to make new algorithms, how to work with 2D-3D graphics and many other cool things. Students should be ready for the challenges of the rigorous academic curriculum and should take an active role in studying this course.

As you may have heard already, computer science is a challenging discipline that requires a lot of patience, perseverance and an open mind. You will have three Assessments

<table>
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<tr>
<th>Create Performance Task</th>
<th>essentially equivalent to a final project, which focuses specifically on the creation of a computer program through the collaborative and iterative process of programming.</th>
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<tbody>
<tr>
<td>Practice: Nov 5-7</td>
<td>AP: Dec 10 thru Jan 10</td>
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<tr>
<th>Explore Performance Task</th>
<th>requires students to identify a computing innovation, explore its impact, and create a related digital artifact — ex. digital art, video — accompanied by a written response</th>
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<tr>
<td>Practice: Feb 20-22</td>
<td>AP: March 25 thru April 12</td>
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<th>Multiple Choice Test</th>
<th>is composed of single-select and multiple-select questions</th>
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<td>Practice: May 1-9</td>
<td>AP: May 10</td>
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In order to get ready for this course, it is very crucial to start early. Your summer work will be the imitation of your AP course. You will have 3 Assignments. There is so much room for creativity and exploration in this course and we have to build your foundation first.

If you run into problems, referring to the online resources, and if necessary send us an e-mail.

Our e-mail addresses: falacatag@bergenfield.org, ifidler@bergenfield.org

For more information about the course: [https://apstudent.collegeboard.org/apcourse/ap-computer-science-principles](https://apstudent.collegeboard.org/apcourse/ap-computer-science-principles)

“The computer is incredibly fast, accurate, and stupid. Man is incredibly slow, inaccurate, and brilliant. The marriage of the two is a force beyond calculation.

Anonymous
**Part 1. Create: (24%) Due by Sep 7**
You will be introduced to the foundational concepts of computer programming, which unlocks the ability to make rich, interactive apps. This course uses JavaScript as the programming language, and App Lab as the programming environment to build apps, but the concepts learned in these lessons span all programming languages and tools.
A. Code.org
   - Go to https://code.org/join.
   - Type in their section code1: VTMQVX
     - section code2: VKTWSK
   - Choose your display name.
   - Choose your secret word.
   - Click the “Sign in” button.
   - Complete all the steps.
   - Take a snapshot of your screen and paste it to attached document (Extra Credit)

Note: Students’ accounts will be checked by the teacher in first day of the school. You need to submit the snapshot to Google Classroom Only

**Part 2. Reading (60%) Due by Sep 7**
You are required to read only chapters 1-4 from this book and answer end of chapter questions.
What is really happening? How our programs are being converted to electrical signals? Etc. What really happens under the hood is written in this book, “Blown to Bits”. This book is available entirely online with a separate PDF file for each chapter. You can access the website through the link below. Save it in your phone/tablet or other e-reader device so you can access it anywhere:
http://www.bitsbook.com/excerpts

Note: Google Classroom or Printed Submission

/*Note that throughout the year, you will be given quizzes on the vocabulary and other content from this book. In addition, your tests will include a significant amount of material from this book. For this reason, while you are reading, I am requiring you to complete: */

**Part 3. Explore (16%) Due by Jan 4, 2019**
You will evaluate current/upcoming technologies and compare benefits and harmful effects and evaluate global impact with your valid resources. Computing Innovations impact our lives in ways that require considerable study and reflection to fully understand them.
Goal of the Task: Explore through research, then explain and represent the impact, function, and societal effects of a computing innovation of your choice.
What you Submit: (1) Computational Artifact (2) Written Responses to prompts 2a-e (with citations of sources for where you found the information).
How you get a good score: The AP committee wants to see that you can:
identify a computing innovation, demonstrate a basic understanding of how it works, discuss the positive and negative effects this computing innovation on society, cite those things with articles or other texts you found doing research.

Do rapid research to find your answers for written prompts...
Finalize written responses and submit! Submissions to Google Classroom Only
**Part 1. Create: (24%) Due by Sep 7**

A. Code.org
   
   Go to https://code.org/join.
   Type in their section code1: VTMQVX
   section code2: VKTWSK
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Note: Students’ accounts will be checked by the teacher in first day of the school. You need to submit the snapshot of completion to **Google Classroom Only**
### Chapter 1: Digital Explosion (%15)


<table>
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<tr>
<th>What is a bit and what does it mean to say (Koan 1) that &quot;it's all just bits&quot;? Give examples of the different kinds of things that today are represented by binary data.</th>
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<tr>
<td>Describe Moore’s Law</td>
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<tr>
<td>Give an example of how the digital explosion is &quot;neither good nor bad&quot; but has both positive and negative implications.</td>
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<td>US society has already reached a point where candidates for public office are often removed from candidacy because evidence exists revealing something undesirable in their past. In this age of social media, the candidates of the next generation may have a public digital history containing decades’ worth of easily discovered photographs, remarks, opinions, etc. which can be searched for such evidence. How do you think this will change the way the public views its public representatives? Will it become easier or harder to be elected with scandals in your past? Will someone about whom very little social media exists be more or less likely to be elected?</td>
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Based on the chapter If you get a summer job and offers you two pay rates:

1. $40 per hour for 40 hours per week for 30 days

2. One cent on day 1, two cents in day two, four cents on day three and on (doubling each day) 5 days a week for 30 days. If you were trying to make as much money as possible in 30 days, which pay rate would you choose? What does this illustrate? (Calculate first then answer)
### Chapter 2: Privacy (%15)


| What is an RFID tag and what does it do? Describe any experience you might have had with one? (THINK! I can almost guarantee you’ve come across several of these!) |
| What is GPS? Compare RFID devices with GPS enabled devices? |
| What's the difference between "big brotherism" and "little brotherism"? |
| The authors' used an analogy of "footprints" and "fingerprints"... what's the difference? Can you give a couple examples of each? |
"The digital explosion has scattered the bits of our lives everywhere: records of the clothes we wear, the soaps we wash with, the streets we walk, and the cars we drive and where we drive them." In 1 or 2 paragraphs, address the following topic: 'Why I am (or am not) worried about my privacy.'
What is metadata? Give an example how it “fingerprinta” a file. Include a discussion of file metadata benefits and challenges.

What is a model, as this term is used in how images and sound recordings are digitized?

What's the difference between a raster image and an ASCII representation of a text document?
What is lossless representation? What is lossy representation? What are the trade-offs in using each representation?

What is steganography and what is it used for?

Using one of the examples given in the chapter as a guide, find the hidden message in the following announcement: Important Liability Information: Keep Employees Contracts Over Dorm Entrance.

What would you have to do to delete a document from your computer so that it could not possibly be read by anyone else?
On page 117, the authors claim that "The architecture of human knowledge has changed as a result of search." What does this claim mean? Do you agree?

When you type a word or phrase into the Google search engine, does it search the web? Explain.

Think of a number between 1 and 100. If you tell me "too high" or "too low" I can guess the number in 7 guesses. How come?

On page 144: "Google emerged -- from this dilemma at least -- with its pocketbooks overflowing and its principles intact." Do you agree?

What do you think about the differences between Figure 4.10 and Figure 4.11?

Compare:
1. Someone pays a search company to raise its position in search rankings
2. Someone pays an SEO firm that understands search engine's rankings to raise its position in search rankings
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<th><strong>How do you feel about #1 ethically? How is #2 different?</strong></th>
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<tr>
<td><strong>What is a captcha and why are captchas important? Free Response</strong></td>
</tr>
<tr>
<td><strong>Free Response: &quot;The architecture of human knowledge has changed as a result of search.&quot; Do you agree?</strong></td>
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**Bonus + 5:** Different algorithms can be developed to solve the same problem. For web searches, Google has its patented PageRank algorithm as part of its search algorithm. What does Yahoo! use? What does Bing use?

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**Part 3. Explore (16%) Due by Jan 4, 2019**

// Insert the picture of your innovation here

Research and writing tips: https://goo.gl/nyqc8C
• Name the computing innovation that is represented by your computational artifact.

• Describe the computing innovation’s intended purpose and function.

• Explain at least one beneficial effect the computing innovation has had, or has the potential to have, on society, economy, or culture. /* Usually the beneficial effect is easy to identify - it’s often the reason the innovation was created in the first place. culture - can be thought of as a group of people: example – football players are a culture, students that have asthma are a culture economy - can be thought of as a group of people with similar economic interests, or whose jobs or or industry are similar. Example: (Netflix put companies like Blockbuster and rental places out of business society - try to avoid saying “impacts to society...”. It’s too broad. Get specific: Which society? Whose society? */

• Explain at least one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture. /* A “harmful effect” should be an unintended consequence of the innovation being used the way it was intended. Focus on how the innovation, even when used correctly, will negatively impact some group of people, either culturally or economically. And cite sources to back up these claims. */

• Describe the data your innovation uses; How the innovation consumes (as input), produces (as output), and/or transforms data? /* Avoid describing the device that captures data. A camera is not data. A digital image is. You don’t necessarily need to know the format of the data. */

• Describe: At least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation. /* For a data security concern, think: what could happen if this data fell into the wrong hands, or were used for something besides the intended use. Could individuals be identified without their knowing it? Could someone or some organization in possession of all this data do something bad with it? */