Concord Academy
Computer Science Placement Test — 2021

INSTRUCTIONS:

- If you have downloaded this test without first reading the **Letter from the Computer Science Department Head**, please stop now and read that first.

- Please take the test on your own, without help from friends and family members, websites (unless specified), the sample test, etc. We want your results to accurately reflect your current skill level.

- Please complete and email the test <u>within one hour</u> of downloading it, even if you are not finished. If you find yourself getting stuck on one section, move on so we can gauge a wider range of your skills.

- Save your work often.

- To preserve the integrity of this process, please do not discuss or share this test with other students.

Thank you! Please proceed to the next page.

Due 3:00 p.m. Wednesday, May 12

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To begin, create a new email message addressed like this:

> **To:**   **Ben_Stumpf@ConcordAcademy.org**
> **Subject:**   **CS Placement Test - Name** *(using your own name)*

Now create the following documents, and attach them to your message or share your Google documents with me. If you share documents, <u>please be sure to give me permission to view or edit them.</u>

Part 1: Presentation, Google image search, image-editing software [15 minutes]

1. Open Google Slides, PowerPoint, or Keynote, create a new file, and save it using your last name as the file name.

2. Use Google Images to find an image of Walden Pond that matches the exact phrase "Walden Pond" and is a PNG image that is at least 1000 pixels wide, and modified in the last year.

    a) Paste the URL of the image you found into the Notes field of the slide.
    b) Use image-editing software to resize the image to 600px wide (keeping the height proportional), and save (or export) it as **lastname.png**, using your last name. Attach the PNG file to your email or put it into your shared folder.
    c) Insert the PNG image into your slide so that it covers the whole screen when presented.

3. For your next slide, briefly answer these questions. Please do <u>not</u> look these up on the Internet.

    a) What does HTML stand for? Briefly describe what those words mean.
    b) Briefly describe how you would make a bibliography using your favorite bibliographic software.
    c) What is a database? Give a brief answer and an example.

    Save and close the presentation, and attach it to your email or put it into your shared folder. Remember to attach or share your PNG file also.

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Part 2: Spreadsheets [15 minutes]

1. Open Google Sheets, Microsoft Excel, or Apple Numbers, create a new file, and save it using your last name as the file name.
2. Below are some data for a CA Model UN fundraiser, showing sales of pizza slices over 20 weeks. Copy it into columns A through E of your spreadsheet.

Week	# Sold	Cost	Price	Profit
1	30	1.15	1.99	
2	55			
3	60			
4	65			
5	70			
6	75			
7	80			
8	85			
9	90			
10	95			
11	100			
12	105			
13	110			
14	115			
15	120			
16	125			
17	130			
18	140			
19	160			
20	190			
25				Solve this!
Sum				

3. Format columns C, D, and E (cost, price, profit) as currency with two decimal places.
4. Use a function to calculate the total number of slices sold in weeks 1 through 20. Put the sum at the bottom of the # Sold column.
5. Enter a formula in Week 1 of the Profit column to calculate the profit they made that week (Profit = Price minus Cost, times # Sold), and fill it down through week 20.
6. Insert a scatter chart with a linear trendline, and use the trendline equation to calculate exactly (to the penny) how much profit the club is expected to make in week 25. Replace the cell marked "Solve this!" with your formula derived from the trendline equation.

   Save and close the file, and attach it to your email or put it into your shared folder.

Part 3: Scratch [15 minutes]

1. Using Scratch (http://scratch.mit.edu), open a new project so the default cat is showing.
2. Add another sprite (your choice) in addition to the cat.
3. Use Scratch blocks to program your new sprite so it can be moved around using the mouse after you click the green Go flag.
4. Add a backdrop (your choice) and draw a bright red line on the bottom of it.
5. When the green flag is clicked, make the cat start at a 45 degree angle, move forever, and bounce off the edges.
6. If your new sprite touches the cat, it should say "hi" for 0.2 seconds.
7. If your new sprite touches the red line, it should stop all.

From the File menu in Scratch, select "Save to your computer" and name the file using your last name. Attach the file to your email or put it into your shared folder.

Part 4: Word Processing [15 minutes]

1. Open Google Docs, Microsoft Word, or Apple Pages, create a new file, and save it using your last name as the file name.
2. Put your full name in the header and an automatic page number in the footer.
3. Create a table with two rows and three columns. Make the borders blue and the cell background color light green.
4. In the left column of the table, write "CA" and add a footnote, with "Concord" as the source.
5. In the right column, enter an equation showing the cube root of 1 divided by pi, like this: $\sqrt[3]{\dfrac{1}{\pi}}$
6. Insert your PNG image from the Presentation question above, type in a few sentences of fake text, and use Text Wrapping so the text wraps around the image.
7. Insert a page break.

Save and close the file, and attach it to your email or put it into your shared folder.

End of Test

Be sure your email message is addressed to Ben_Stumpf@ConcordAcademy.org and you have attached or shared all your files (Presentation, PNG, Spreadsheet, Scratch, Word Processing). Again, to preserve the integrity of the placement process, please do not discuss or share this test with other students. Thank you!