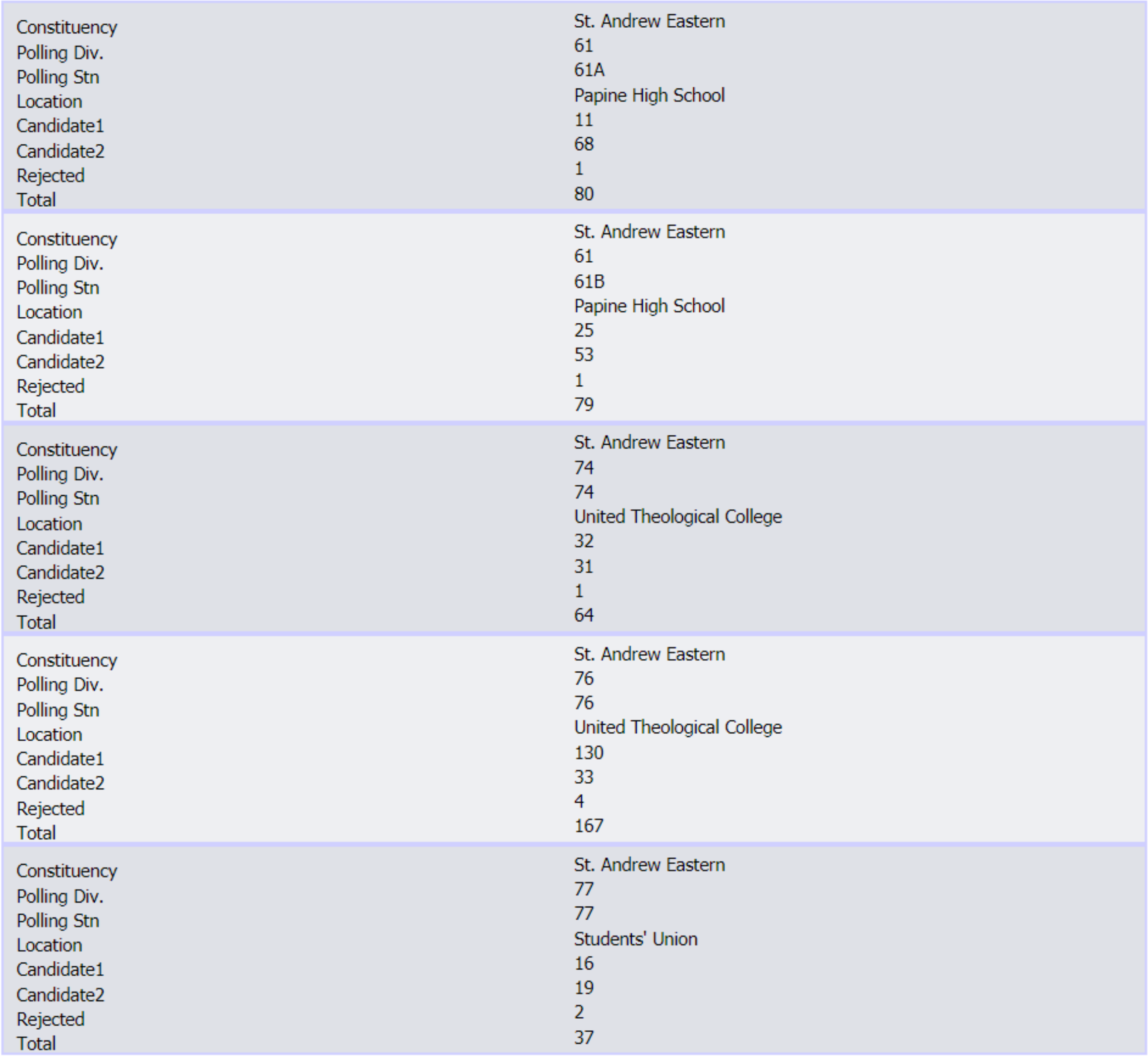
Web Programming

Assigned: Nov. 20, 2020
Due: Nov. 27, 2020 @2355
Version: 0.1.0

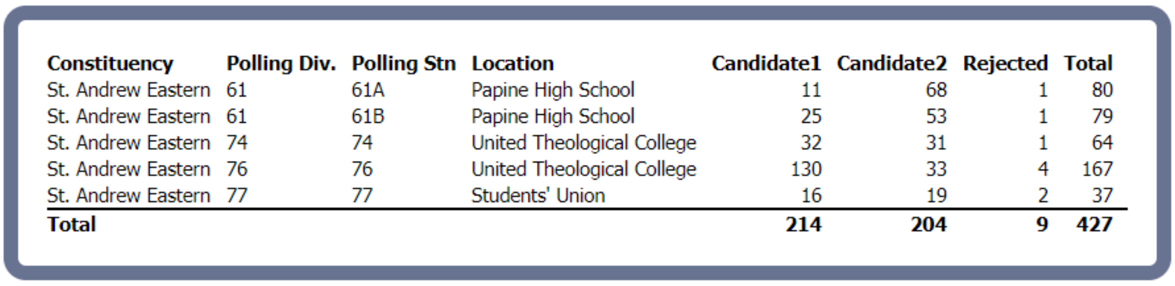
Problem 1 (10 points)

Create a single HTML document that presents two different appearances, determined by the document's CSS stylesheet. Your HTML file should be called p1.html and the two stylesheets should be called p1a.css and p1b.css. If the HTML file links to p1a.css then it should appear like this ("Version A"), assuming you are running Chrome 86.0 on a Windows 10 machine:



Constituency	St. Andrew Eastern
Polling Div.	61
Polling Stn	61A
Location	Papine High School
Candidate1	11
Candidate2	68
Rejected	1
Total	80
Constituency	St. Andrew Eastern
Polling Div.	61
Polling Stn	61B
Location	Papine High School
Candidate1	25
Candidate2	53
Rejected	1
Total	79
Constituency	St. Andrew Eastern
Polling Div.	74
Polling Stn	74
Location	United Theological College
Candidate1	32
Candidate2	31
Rejected	1
Total	64
Constituency	St. Andrew Eastern
Polling Div.	76
Polling Stn	76
Location	United Theological College
Candidate1	130
Candidate2	33
Rejected	4
Total	167
Constituency	St. Andrew Eastern
Polling Div.	77
Polling Stn	77
Location	Students' Union
Candidate1	16
Candidate2	19
Rejected	2
Total	37

If the HTML file links to p1b.css then it should appear like this in Chrome 86.0 on Windows 10 ("Version B"):



Constituency	Polling Div.	Polling Stn	Location	Candidate1	Candidate2	Rejected	Total
St. Andrew Eastern	61	61A	Papine High School	11	68	1	80
St. Andrew Eastern	61	61B	Papine High School	25	53	1	79
St. Andrew Eastern	74	74	United Theological College	32	31	1	64
St. Andrew Eastern	76	76	United Theological College	130	33	4	167
St. Andrew Eastern	77	77	Students' Union	16	19	2	37
Total				**214**	**204**	**9**	**427**

Here are some additional details and requirements for this problem:

- The content should be described in a single HTML file, using a <table> element to display the main table.
- There may not be any formatting information in the HTML file other than class and id attributes.
- The appearance must be generated entirely with CSS style information; you may not use images or JavaScript for this problem.
- The only change that should be required to switch from Version A to Version B is to change the `<link>` element in the header to refer to a different CSS file.
- Your CSS files must appear in a directory called `styles/`.
- Try to duplicate the appearance in the images above exactly ("pixel perfect"). For example:
    - Some of the columns should be right-justified whereas others are left-justified.
    - The "Total" line appears only in Version B (hint: you may find the display attribute useful in producing this effect).
    - The title in the browser title bar should read "CS 2190 Project 3, Problem 1".
    - Both versions use the Gill Sans font in a 13-pixel size.
    - The background colors for the body rows in Version A are #eeeff2 and #dfe1e7.
    - The lines between the rows in Version A are 2 pixels wide with a color of #d0d0ff.
    - The color for the frame around Version B is #687291.
    - The frame in Version B is 10 pixels wide; there are 20 pixels of empty space on either side of the frame.
    - The frame in version B has a border radius of 15 pixels at each corner.
    - The horizontal rule above the "Total" line in Version B is 2 pixels wide.
    - Match the paddings and spacings as closely as possible.
- Your HTML file must be a valid XHTML document that passes validation at http://validator.w3.org, and your CSS files must pass validation at http://jigsaw.w3.org/css-validator/

Problem 2 (15 points)

Write the XHTML code to create a form with the following capabilities:

- Text widgets to collect the clerk ID, constituency ID, polling division ID, polling station, votes for candidate 1, votes for candidate 2, rejected ballots, and total number of votes.
- You should also include a hidden field with the value “e11869d1186d0791”.
- When the Submit button the form is clicked, a JavaScript validation function must be run. This function should ensure that
    1. None of the fields listed above is empty.
    2. All the fields except for the polling station are integers.
    3. The polling station field contains alphanumeric values, i.e., [A-Z,0-9]
    4. The total votes field must be equal to the sum of the votes for candidate 1, candidate 2, and the rejected votes.
- The title in the browser title bar should read “Vote logging form”
- The form should use the Gill Sans font in a 13-pixel size.
- If an error is detected in a field during validation, that field should be colored in red.
- Your HTML file must be a valid XHTML document that passes validation at http://validator.w3.org, and your CSS files must pass validation at http://jigsaw.w3.org/css-validator/

Problem 3 (35 points)

For this problem you will use a database named “VoteLogDB. Use the database username “comp2190SA” with the password “2020Sem1”. The VoteLogDB should contain a table called StationVotes. The fields of the table are as follows:

Field	Data type
Constituency_id	Integer
Clerk_id	Integer
Poll_division_id	Integer
Polling_stn	String
Candidate1Votes	Integer
Candidate2Votes	Integer
RejectedVotes	Integer
TotalVotes	Integer
recordDigest	String
ID	Integer, autonumber

Write a PHP script that collects the data from the form described in Problem 2 and stores all the fields in a database. Your code should verify that the data is valid before storing it. Valid data means that the conditions listed in Problem 2 are satisfied. After each new and valid set of votes is submitted, print the contents of the database to a table that is formatted as in Problem 1-b. You do not need to print either the clerk_id or the recordDigest. For now, we will ignore the computation of the recordDigest field.

Rules

- **The project is designed to be solved independently**.
- **You may not share submitted code with anyone.** You may discuss the assignment requirements or your solutions away from a computer and without sharing code, but you should not discuss the detailed nature of your solution. If you develop any tests for this assignment, you may share your test code with anyone in the class. Please **do not put any code from this project** in a public repository.
- You may not use external JavaScript libraries such as JQuery.
- You are not to rely on any external functionality to validate your data (I am aware that libraries exist). I want all students to write the necessary validation code themselves. Students who rely on libraries or HTML5 validation to complete the tasks will not receive credit for writing the validation functions. However, it is okay to write regular expressions to validate your data.
- Ensure that your archive can be unzipped following the specification shown in the OurVLE submission slot for this assignment.

What to turn in

1. You will hand in all of your XHTML, CSS, JavaScript, and PHP files. All of your CSS files must appear in a directory called 'styles', your JavaScript and PHP files in a directory called 'scripts'.
2. A separate (typed) document of a page or so, describing the overall program design for Problem 3, a verbal description of "how it works," and design tradeoffs considered and made. Also describe possible improvements and extensions to your program (and sketch how they might be made).
3. A separate description of the tests you ran on your program to convince yourself that it is indeed correct. Also describe any cases for which your program is known not to work correctly.

Grading

- XHTML and CSS files for Problem 1.
  - Page displays correctly as specified in assignment sheet – 7 points
  - Pass validation – 3 points
- XHTML, CSS and JavaScript files for Problem 2.
  - Form displays correctly as specified in assignment sheet – 5 points
  - Validation function works as specified on assignment sheet – 7 points
  - Passes validation – 3 points
- Program listing for Problem 3
  - Works correctly as specified in assignment sheet – 20 points
  - Contains relevant in-line documentation – 3 points
  - Elegant code, i.e., proper decomposition of functionality – 2 points
- Design document
  - Description – 5 points
  - Thoroughness of test cases – 5 points