Project Requirements

Constraints

- Work without an internet connection
- Fit on a display 2'x2'x2'
- Have educational value

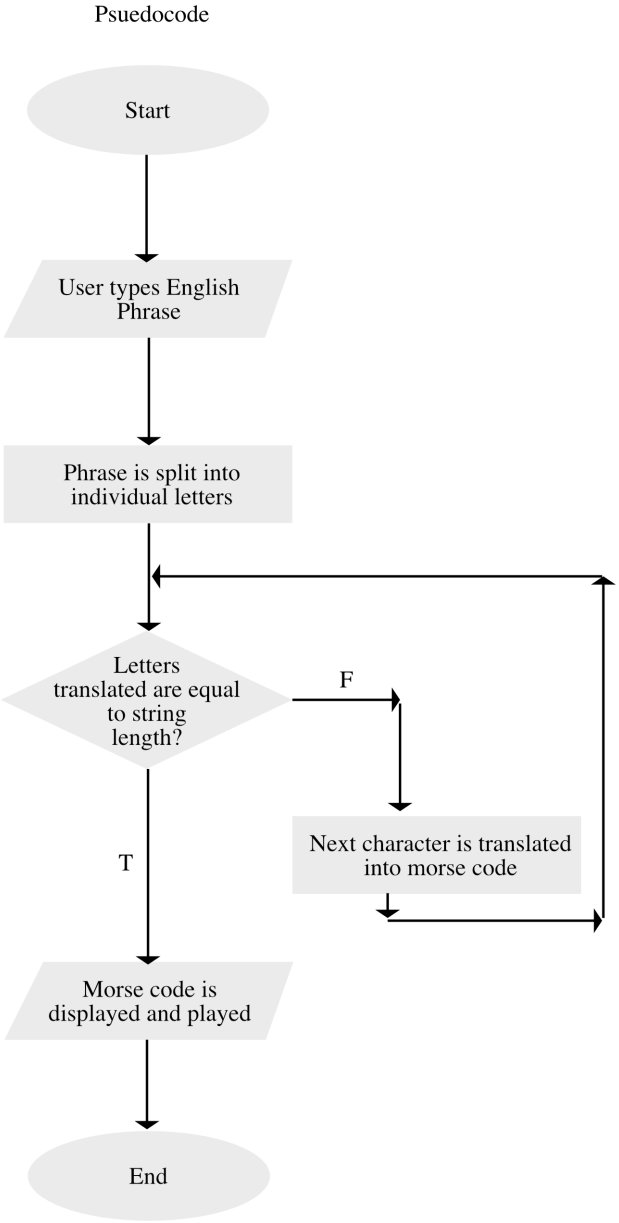
Criteria

- Software Coding Practices
  - The project was extremely well developed and followed general software coding practices (requirements, design, implementation and testing).
- Complexity
  - The software design is complex, resulting in a highly functional product.
- Creativity
  - The work exudes creativity; the product is highly original.
- Technical Skill
  - The software exhibits mastery of software design skill that few at this level possess; the software flow is consistent and logical
- Effectiveness
  - The solution to the problem is clear in the software design; the solution is at the forefront of software creation.

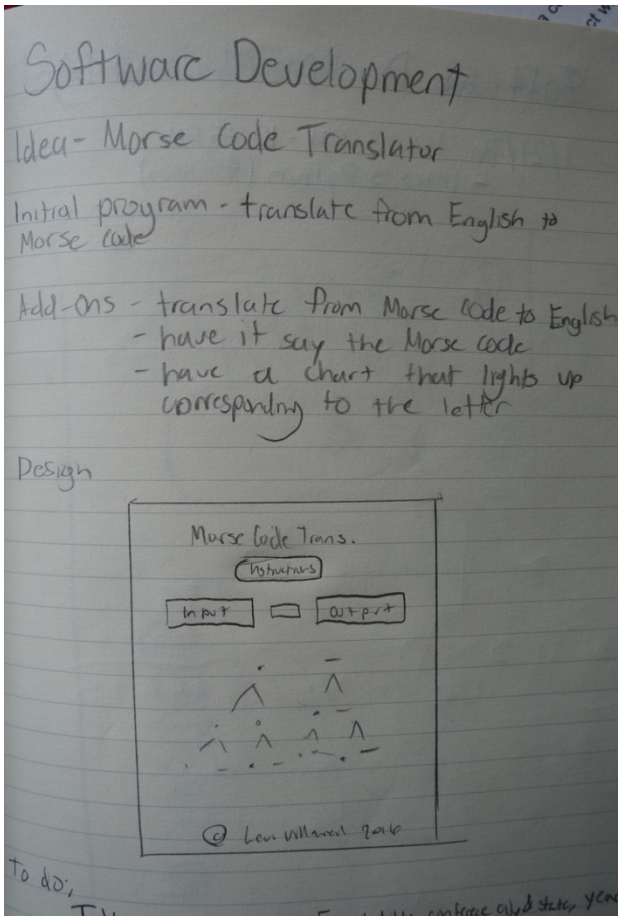
Presentation Criteria

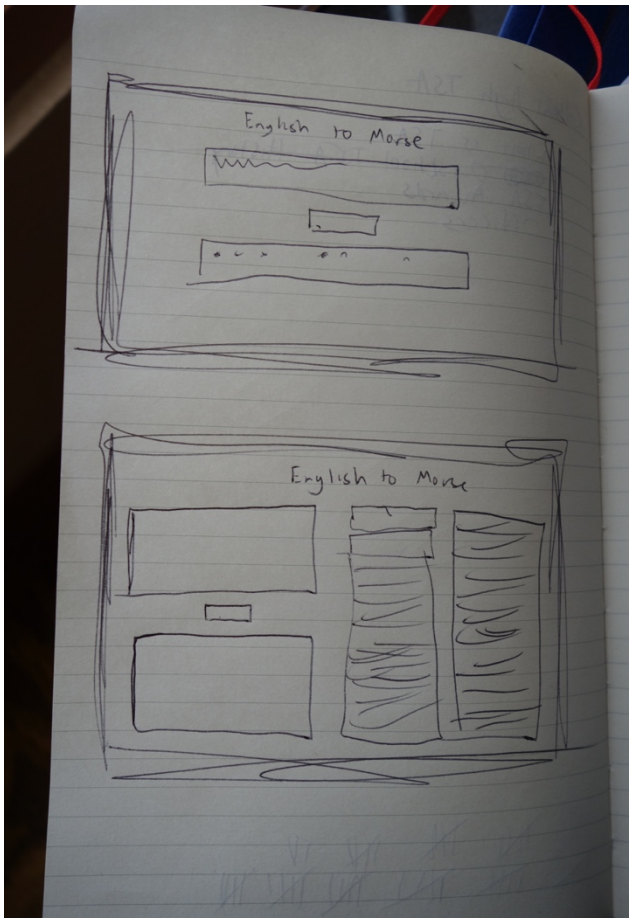
- Organization
  - The presentation is logical, organized and effective.
- Knowledge
  - There is clear evidence that all team members have a thorough understanding of the concepts presented in their project.
- Articulation
  - The team provides a concise, logical, and clear explanation of its project.
- Delivery
  - The team is well-spoken and interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective delivery.
- Team Participation
  - All team members fully understand the concepts of the project and share an equal role in answering judges' questions.
- Software Demonstration
  - Team members are successful and effective in their project demonstration.

High-Level Software Design

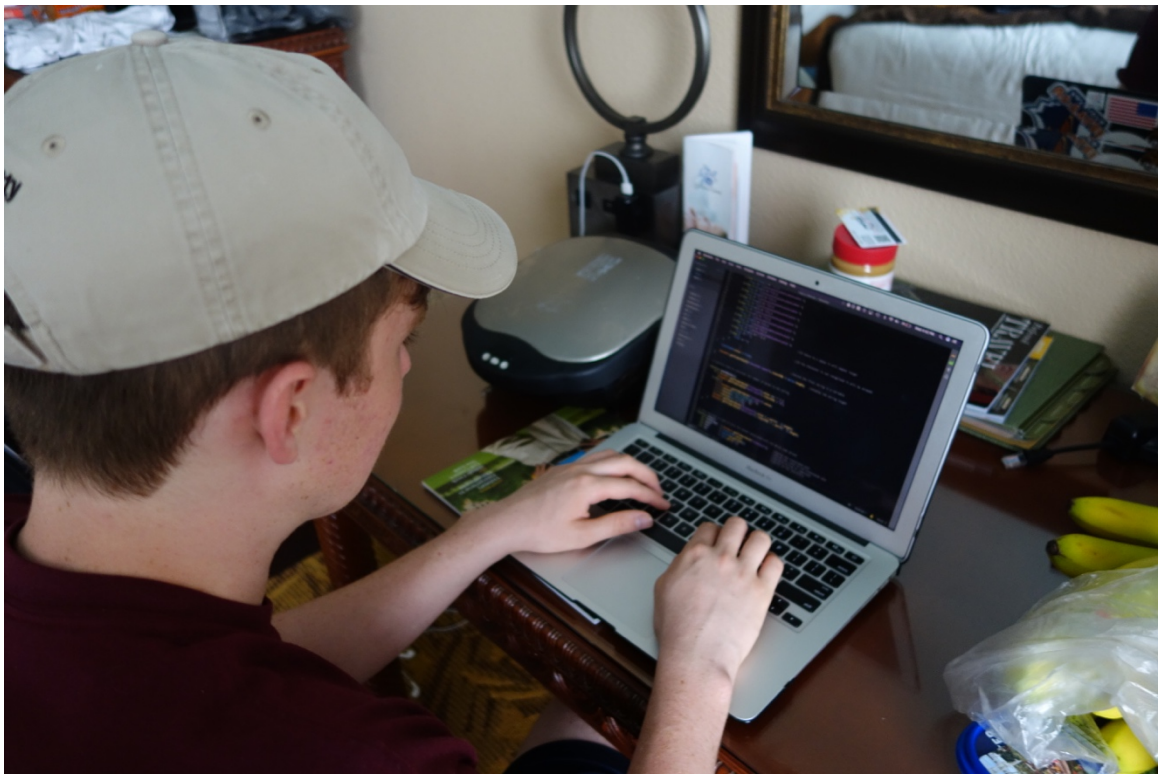


Testing / Code Output

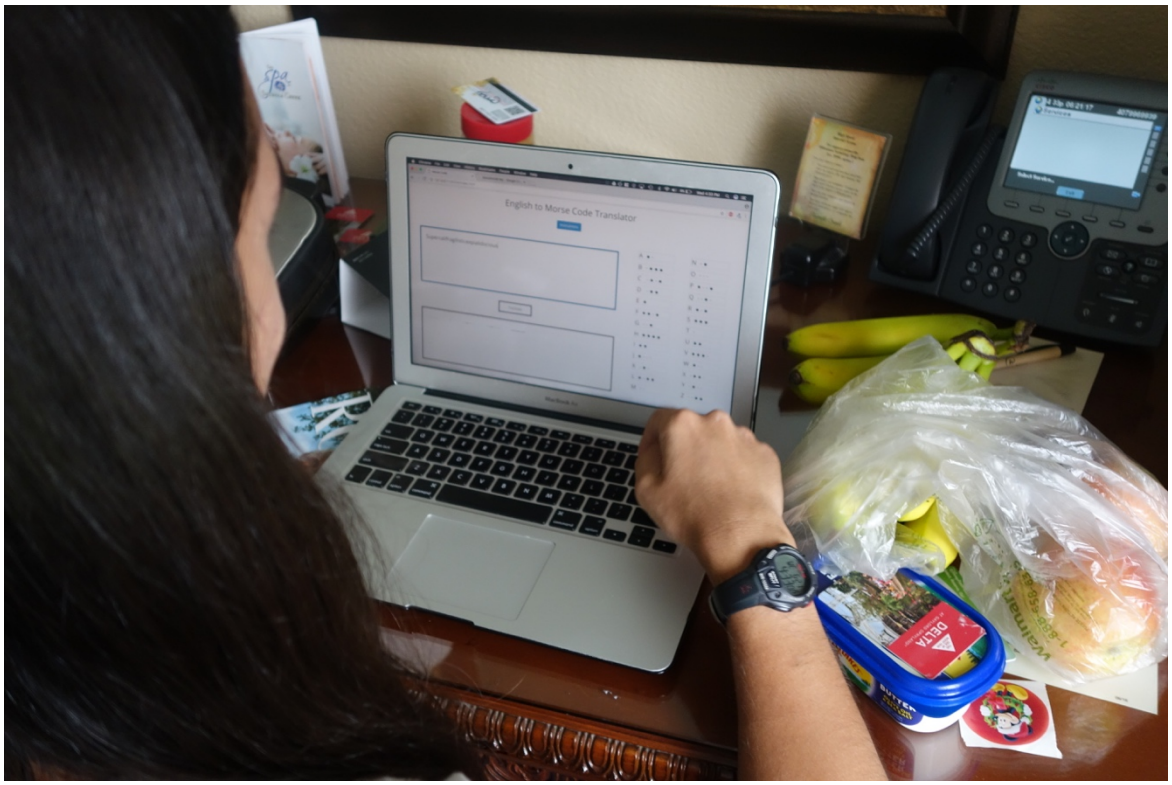




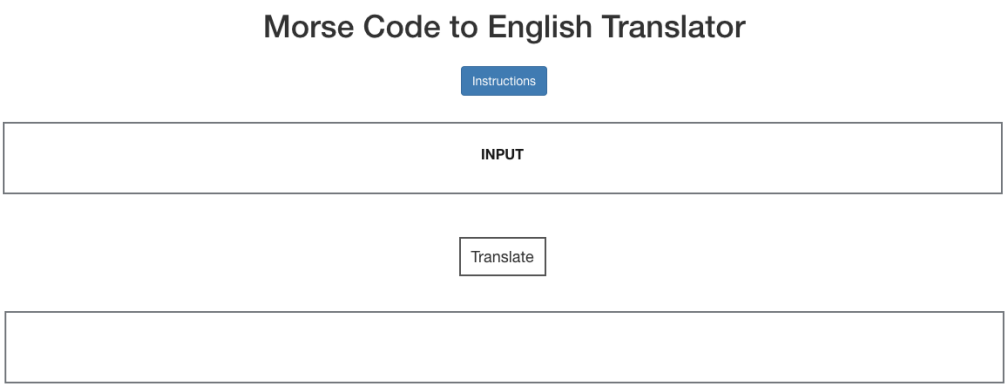
Initial and final sketches



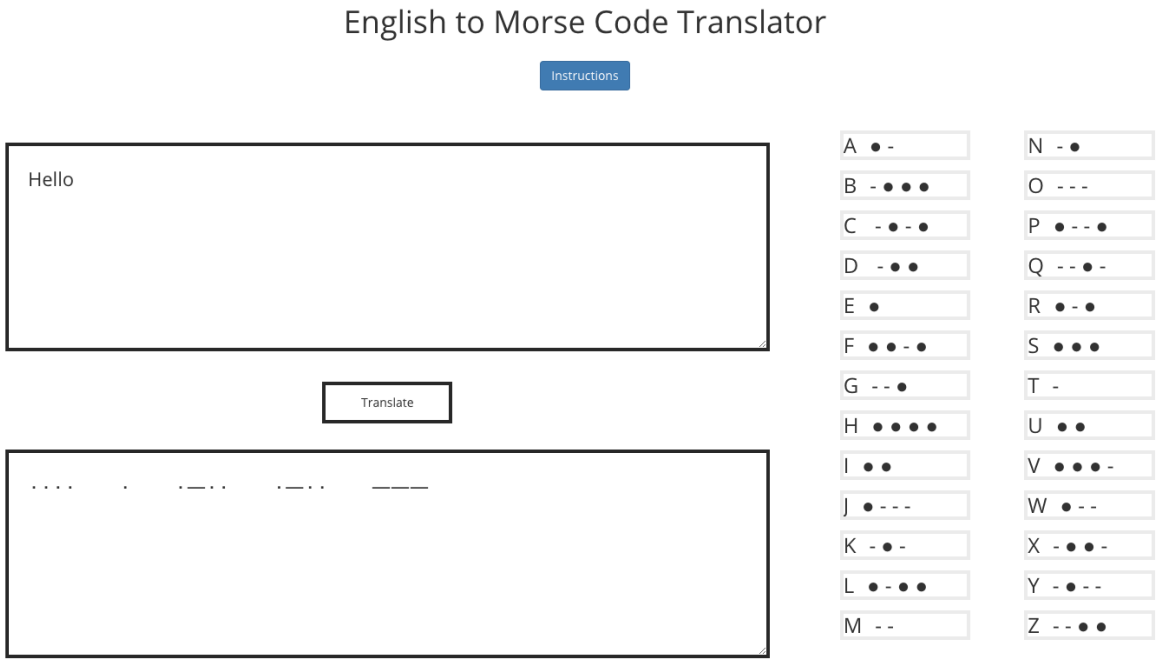
Code Development



Code Testing



Early Software Design



Final Software Design

JavaScript Used

```
//Run the function if the enter key is pressed

if (document.layers) {
   document.captureEvents(Event.KEYDOWN);
}

document.onkeydown = function(evt) {
   var keyCode = evt ? (evt.which ? evt.which : evt.keyCode) : event.keyCode;
   if (keyCode == 13) {
      countWords()
      translate();
      play();
   }
};

// Variables for the translation

function translate() {
   var text = document.getElementById("txtInput"); //Stores the text in the input field
   var translated = document.getElementById("txtOutput"); //Stores the text in the
output field
   var morse = text.value; //Stores the value of the text from the input field
   var res1 = morse.toLowerCase(); //Converts the string to lowercase
```

```
var res = res1.split(""); //Splits up the characters
var prop = res1.length; //Calculates the length of the string
var i; //Used in the for loop
var final = ""; //Used to build the final statement



/*
   The Morse code characters are as follows
   \u2219 is the dot
   \u2014 is the dash
*/


for (i = 0; i < prop; i++) { //The function will repeat until the string runs out of characters
   if (res[i] == "a") {
      final += "\u2219\u2014 "; //Has the correct Morse code translation for each character
   } else if (res[i] == "b") {
      final += "\u2014\u2219\u2219\u2219 ";
   } else if (res[i] == "c") {
      final += "\u2014\u2219\u2014\u2219 ";
   } else if (res[i] == "d") {
      final += "\u2014\u2219\u2219 ";
   } else if (res[i] == "e") {
      final += "\u2219 ";
   } else if (res[i] == "f") {
      final += "\u2219\u2219\u2014\u2219 ";
   } else if (res[i] == "g") {
```

```
    final += "\u2014\u2014\u2219 ";
} else if (res[i] == "h") {
    final += "\u2219\u2219\u2219\u2219 ";
} else if (res[i] == "i") {
    final += "\u2219\u2219 ";
} else if (res[i] == "j") {
    final += "\u2219\u2014\u2014\u2014 ";
} else if (res[i] == "k") {
    final += "\u2014\u2219\u2014 ";
} else if (res[i] == "l") {
    final += "\u2219\u2014\u2219\u2219 ";
} else if (res[i] == "m") {
    final += "\u2219\u2219 ";
} else if (res[i] == "n") {
    final += "\u2219\u2014 ";
} else if (res[i] == "o") {
    final += "\u2014\u2014\u2014 ";
} else if (res[i] == "p") {
    final += "\u2219\u2014\u2014\u2219 ";
} else if (res[i] == "q") {
    final += "\u2014\u2014\u2219\u2014 ";
} else if (res[i] == "r") {
    final += "\u2219\u2014\u2219 ";
} else if (res[i] == "s") {
    final += "\u2219\u2219\u2219 ";
} else if (res[i] == "t") {
    final += "\u2014  ";
} else if (res[i] == "u") {
```

```
            final += "\u2219\u2219\u2014 ";
        } else if (res[i] == "v") {
            final += "\u2219\u2219\u2219\u2014  ";
        } else if (res[i] == "w") {
            final += "\u2219\u2014\u2014 ";
        } else if (res[i] == "x") {
            final += "\u2219\u2014\u2014 ";
        } else if (res[i] == "y") {
            final += "\u2014\u2219\u2014\u2014 ";
        } else if (res[i] == "z") {
            final += "\u2014\u2014\u2219\u2219\u2219 "; //Contains the translation for
numbers
        } else if (res[i] == "0") {
            final += "\u2014\u2014\u2014\u2014\u2014 ";
        } else if (res[i] == "1") {
            final += "\u2219\u2014\u2014\u2014\u2014 ";
        } else if (res[i] == "2") {
            final += "\u2219\u2219\u2014\u2014\u2014 ";
        } else if (res[i] == "3") {
            final += "\u2219\u2219\u2219\u2014\u2014 ";
        } else if (res[i] == "4") {
            final += "\u2219\u2219\u2219\u2219\u2014 ";
        } else if (res[i] == "5") {
            final += "\u2219\u2219\u2219\u2219\u2219 ";
        } else if (res[i] == "6") {
            final += "\u2014\u2219\u2219\u2219\u2219 ";
        } else if (res[i] == "7") {
            final += "\u2014\u2014\u2219\u2219\u2219 ";
```

```
        } else if (res[i] == "8") {
            final += "\u2014\u2014\u2014\u2219\u2219 ";
        } else if (res[i] == "9") {
            final += "\u2014\u2014\u2014\u2014\u2219 ";
        } else if (res[i] == " ") { //If there is a space it will appear larger
            final += " ";
        } else {
            final += ""; //If the character is not recognized it will be skipped
        }
    }

    translated.value = final; //Stores the final string in a variable
    document.getElementById("character-count").innerHTML = morse.length; //Display the string length
}

// Function used to calculate the number of words in the string

function countWords() {
    if (document.getElementById("txtInput").value === "") {
        document.getElementById("word-count").innerHTML = "0";
    } else {
        s = document.getElementById("txtInput").value;
        s = s.replace(/(^\s*)|(\s*$)/gi, "");
        s = s.replace(/[ ]{2,}/gi, " ");
        s = s.replace(/\n /, "\n");
        document.getElementById("wordcount").value = s.split(' ').length;
        document.getElementById("word-count").innerHTML = s.split(' ').length;
```

```
    }
}

// This function is used to play the sounds associated with the Morse code phrase
function play() {
    var translated = document.getElementById("txtOutput"); //Stores the translated text
    var sound = translated.value; //Stores the value of the translated text
    var res1 = sound.toLowerCase(); //Converts string to lowercase
    var res = res1.split(""); //Splits up the characters
    var prop = res1.length; //Calculate the length of the string
    var i; //Used in the for loop

    var dit = new Audio('dit.mp3'); //Create an audio element for the dot
    dit.playbackRate = 1.5; //Establish the playback speed
    var dah = new Audio('dah.mp3'); //Create an audio element for the dash
    dah.playbackRate = 1.5; //Establish the playback speed

    for (i = 0; i < prop; i++) { //The function will repeat until the string runs out of
characters

        if (res[i] == "\u2219") { //If the character is a dot
            setTimeout(function() {
                dit.play(); //Play the dit sound
            }, i * 750); //Wait for the dit sound to finish
        } else if (res[i] == "\u2014") { //If the character is a dash
            setTimeout(function() {
                dah.play(); //Play the dit sound
            }, i * 750); //Wait for the dit sound to finish
```

```
        } else {}
    }
}
//When the translate button is pressed these functions will be called

function someFunc() {
    countWords()
    translate();
    play();
}
//When the play button is pressed these functions will be called

function anotherFunc() {
    countWords()
    translate();
    play();
}
```

End User Product Documentation

Beta testing

User 1 comments -

- Translation is very buggy
- The dashes run together, making it hard to read the Morse code
- The area to type in is not very big
- The design of the software is clean and minimal

User 2 comments

- Adding sound to the translator would be a lot cooler
- Some sort of alphabet would be helpful for learning Morse code
- Translation doesn’t work every time

User 3 comments

- Really liked the look of the program
- Translations didn’t always work
- Not very much information

Final product testing

User 1 comments

- Liked how you could see and hear the translation at the same time
- Liked how it showed the alphabet on the right side of the screen
- Didn’t have a single wrong translation

User 2 comments

- The sound of the Morse code sounded very authentic
- It would be nice to be able to speed up or slow down the speed of the beeps
- Didn’t have a single wrong translation

User 3 comments

- Liked how the new program allowed for more lines to input text
- Thought the speed of the beeps were a bit slow
- Didn’t have a single wrong translation