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| Project NumberCSC134 Project | Project 4 |
| Project Name | Morse Code Project |
| Project Filename | Firstname\_Lastname\_Project4 (example: *Jessica\_Smith\_Project4*) |
| Chapter Review | Chapter 6Use only the concepts covered in Chapters 1 - 6 to complete this project. Failure to do so may result in a 0 for the assignment.Students are expected to complete the practice programs before starting the project. |
| Points | 50 |
| Assistance | Instructors and teaching assistants have been available to assist with all practice work. Students are now expected to complete this project without assistance from others (this includes receiving assistance from individuals inside or outside of CPCC). Students should consider projects as non-proctored exams. Please review the academic integrity policy on your syllabus.Please note: students can continue to receive assistance with practice work up to 5:00 p.m. on the due date (review the late period on the syllabus). |
| Project Description | For this part of the project, you will add functionality to calculate the total cost of all telegram bills in the data file and you will break up your program into manageable pieces. Instead of having one long main function that contains all the statements necessary to solve the problem given in previous projects, you must write several small functions that each solve a specific part of the problem. These small functions should then be executed in the correct order to implement a complete solution. The named constants you used for the amount owed calculation should now be made global so you won't have to pass those values to any function.  Use the *Divide and Conquer* approach described in **Section 6.1** of your textbook to modularize your program. Think about all the different tasks your program is doing and make a list. Make sure each task doesn't include multiple tasks. If it does, break it into subtasks. Once you have your list of tasks and subtasks, you'll know what functions you'll need to write. For this project, your list MUST include the following:   * a function that displays the menu * a function that **only** accepts the number of words sent and returns the amount owed * a function that accepts a complete message and returns the cooresponding full morse code translation * a function that reads the text file and creates and displays telegram bills for each record in the file   Make sure your program uses the values returned from your functions. Any functions that need input to perform a task will have to accept parameters. **Global variables are prohibited**.  You are strongly encouraged to use the *Stubs and Drivers* approach the author of your textbook talks about in **Section 6.16** when writing your functions. Write one function at a time thoroughly testing one before starting another. This will isolate any errors to just one block of code making your program much easier to debug.  **Instructions:**   1. Add functionality to calculate the **total** cost of all the telegram bills in the text file. Display the total cost after displaying the individual telegram bills. Make sure your program will correctly calculate the total cost no matter how many records are in the text file. The format should match the one in the **Sample Output** on page 3. 2. Use the *Divide and Conquer* approach described in **Section 6.1** of your textbook to modularize your program. 3. Write a function that displays the menu. 4. Write a function that **only** accepts the number of words sent and returns the amount owed. 5. Write a function that accepts a message and returns the cooresponding morse code. The main function, not this function, should display the morse code. 6. Write a function that reads the specified text file and creates and displays telegram bills for each record in the file. 7. Make the local **named constants** you used in Project 1 global. 8. Save your **.cpp** file using the Project**4**\_Firstname\_Lastname naming format. Upload in Moodle.   **Bonus Pts (5pts).** Follow all the instructions above. Add functionality to find and display the cost of the largest telegram bill in the text file. Your code MUST be efficient and work no matter how many records are in the text file. You must follow all these instructions to receive full credit. |

# Sample Output

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| Welcome to Western Union Telegraph Company  1 – Process Telegram Bill  2 – Translate to Morse Code  3 – Process a Data File  4 - Quit  Enter your choice: 2  Enter a message: That’s it!  Translation: **- . . . . . - - ‘ . . . . . - !**  1 – Process Telegram Bill  2 – Translate to Morse Code  3 – Process a Data File  4 - Quit  Enter your choice: 3  Leslie Knope  1456 Plymouth Street  Pawnee, IN 47408 Amount Owed: $35.50  Tom Haveford  689 Lil Sebastian Avenue  Pawnee, IN 47408 Amount Owed: $11.00  April Ludgate  1123 9th Avenue  Wamapoke, IN 48034 Amount Owed: $18.00 | Jery Gergich 3124 Woodbridge Road  Eagleton, IN 47322 Amount Owed: $114.00  Donna Meagle  1200 Elysian Fields Blvd  Eagleton, IN 47322 Amount Owed: $73.50  **The total cost of all the telegram bills is $252.00**  1 – Process Telegram Bill  2 – Translate to Morse Code  3 – Process a Data File  4 - Quit  Enter your choice: 44  44 is not a valid choice  1 – Process Telegram Bill  2 – Translate to Morse Code  3 – Process a Data File  4 - Quit  Enter your choice: 4  Thank you. Closing program |

# GradingScore Card: 50

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| **OBJECTIVE** | **DESCRIPTION** | **POINTS** |
| Required Value(s) Correctly Calculated | The total cost of all the telegram bills in the data file is correctly calculated and displayed. | 5 |
| The algorithm is efficient and the output format matches the **Sample Output.** | 5 |
| Program is Modular | All four of the required functions have been written as specified and are called correctly. All functions perform a single task and correct output is produced for all input. | 20 |
| Functions have self-describing names. | 5 |
| Function prototypes exist for all functions. | 5 |
| Global Named Constants | Named constants are used in all telegram bill calculations and are not passed as an arguments to any of the functions. No global variables are used. | 5 |
| Documentation and Programming Style | * Multi-line comment present at the beginning of the program that contains: your **Name**, **Date** and **Purpose** which fully describes what your program does. * Adequate descriptive comments used throughout program. There must be at least four comments to receive credit for this step. * Proper indentation and spacing used throughout program. * Proper naming conventions used throughout program. | 5 |
| **TOTAL** |  | **50** |
| **Bonus Points** | Functionality was added to find and display the cost of the largest telegram bill in the text file. Code MUST be efficient and work no matter how many records are in the text file. | **+5** |
| **Point Deduction** | Program does not compile without errors. | **-20** |