**Description:**

*ABC Consulting Inc. Management Software* adds digitalization and simplicity in retrieval and storage staff records, calculation of bonuses, analyzing metrics to motivate employees as well as putting a few on probation due to lack of performance. Currently, the staff includes two types of employees: Consultants and Directors. This document highlights how to get the best results from the program and explains the code in broad terms, understandable by anyone.

**How to Operate:**

When you receive the folder, just run *(double-left click or right-click and select “Open”)* the “main\_program.py” file. This will fire up a small black background window, with a menu displayed. Enter the option you want to pursue and follow instructions as mentioned on screen. As simple as that!

Other files you will see in the folder:

1. emp\_beg\_yr.txt: This text file carries data about employees at the beginning of the year.
2. evaluation.txt: Contains the feedback given of each employee.
3. timesheet.txt: Includes the hours worked by each employee.
4. sales.txt: Holds the sales made by the Directors, denoted by their ID numbers.
5. emp\_end\_yr.txt: Generally visible after program run. Contains employee’s data at the end of the year.
6. error.txt: Holds the discrepancies found in above text files.

**Code Explanation:**

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The line that starts with the hash “#” are called Comments. These are not used by the computer to run the program. Here, libraries i.e., statistics (for finding mean, median, mode, etc.), string (string-related functions), time (time-related functions), os (operating system dependent functionality), numpy (alias set as np, mathematical functions) are used. These provide added functionality to the program – basically contain already written code, for example the mean function, so we would not have to code for the mean function from scratch.

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A class can be defined as a blueprint. And each item made using the blueprint is called an object or an instance. Here, we’re working on the staff members, and functionality is custom-made for the employees.

**Functions within class Staff:**

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Getter/Accessor Functions are specifically designed so that an outsider cannot access protected variables (can contain crucial data), thus causing errors. To edit them accurately and according to standards, Getter functions are used. Here we use Getter functions for Employee ID (eid), Employee Name (emp\_name), Base pay, Employee type, and new sales.

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Setter/Mutator Functions are also created to change the value of the protected variables. To edit them accurately and according to standards, Setter functions are used.

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A Constructor Function is used to allocate values to an object. This is always a required function in the case of custom-made blueprints (classes).

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Print\_emp\_details function prints the details of the employee such as the employee ID, type, name, utilization rate, evaluation score, new sales, base pay, and bonus.

Bonus\_calc function calculates the bonus as received from the formula and returns the value. This value is then stored in a variable and used for further analysis.

**Functions outside Class:**

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A dictionary (for holding data) named staff is declared as empty at first. Later, the data is extracted from the three files: emp\_beg\_yr.txt, sales.txt and timesheet.txt, and immediately objects are created, stored in the dictionary staff.

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Write\_errors function collects errors found within the text files and stores them in another text file called “error.txt”.

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A dictionary named “words” is created to store the positive words and negative words that are to be counted within the feedback of each employee to generate evaluation score.

Eval\_scorer function takes a parameter of a string that contains the feedback, divides it into pieces and uses each word in the feedback, comparing it with the words in the positive or negative words list and calculating the evaluation score. This score is returned and assigned as the employee’s evaluation score.

Update\_eval\_score function is created and called so that all the Consultants have an evaluation score based on the initial criteria set i.e., existing list of positive and negative words.

Add\_del\_category function is designed for the user to create or delete a category of his/her own choice, to be used to compute evaluation scores.

Add\_del\_eval\_words function is created to add or delete existing words from a category.

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Mgmt\_bonus\_test function is designed for the executives of the management team to test out various percentages, for which the program returns the total bonus amount. The executive has an option to try out a different percentage to see various totals and finalize one.

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Final\_write function is made such that once all actions the user has performed to their satisfaction, the new staff data is stored for later use/reference.

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Emp\_search function is designed to allow the user to search for an employee based on their Employee ID, and the function returns the entire Employee Details.

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Desc\_Analytics function provides the user the minimum, maximum, mean, median, mode and standard deviation on a particular metric. This metric could be the utilization rate, sales, evaluation score or bonus.

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sendLOR function is created to compute the list of employees who have the highest utilization rate and highest sales and displays their details to send a letter of Recognition to them.

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Probation is a function that compiles the list of poor performing Consultants who have their utilization rate less than a standard deviation from the mean and their evaluation scores less than zero. If any, displays their ID and name.

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Print\_employees\_info function allows the user to enter his choice of the number of employees’ information they’d like to see, or if they want to see all employees’ information.

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The above code are the building blocks of the user interface. Designed to take input from user and perform a particular action. Also asks user to try again if wrong input is given.

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