Accuracy and Usefulness in Programming

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Abstract

Due to the various different characteristics that are availble while creating a document it is imperative to have a program that can keep track of variables. This paper will The metrics which we will use to record accuracy of such input will be the MIP program. The MIP program will result in various functions that will allow us to design a code for repeated characters represented. The program inputs will will keep track of the repetitive characters represented along with which case the characters are in. mips are a coding mechanism created to evaluate and keep track of language assembly. This project's name is the usefulness and accuracy of mips in programming.

Keywords— TMR, MIPS, NMR

I. Introduction

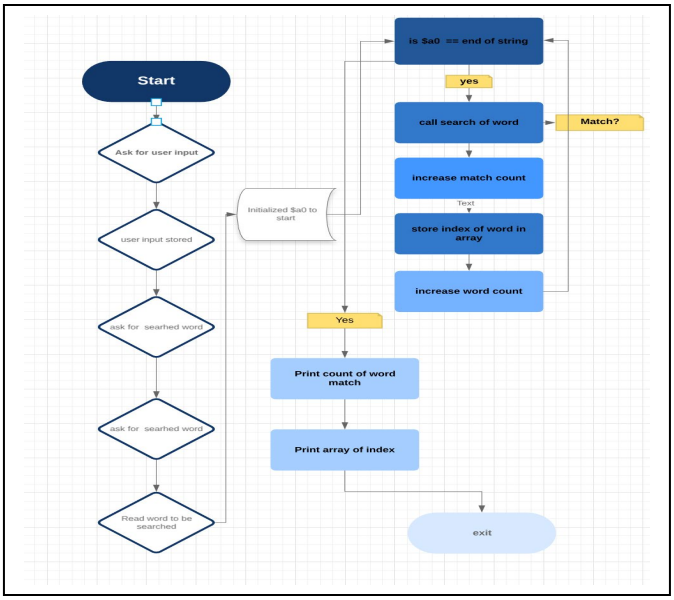
MIPS is very useful program that can do multiple function in a very short period of time with a reliable and accurate output. One unique aspect of MIPS is that we can design a code that can count the number of occurrence of any specific word searched by a user input.

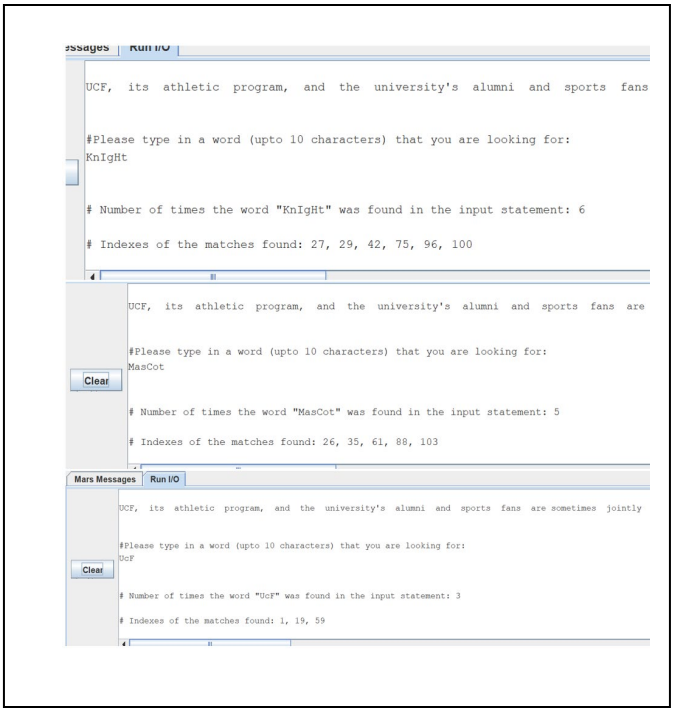
The objective of the program is to develop a code that ask the user to for input statement and then ask for a search word. This program will count the number of appearances of any searched word is used in the input statement. This design code ought to count both upper and lower case existences of the desired values. This program is to output how many times it appeared in the statement as well as in which index it is in which means we get to know that where the searched word is located.

A. Project Design

This design starts off by asking the user to input a statement. The user input is uploaded in a register Afterwards this program asks the user to input a word which needs to be searched. The program will proceed to read the word and stored in a register. It goes through different loops and cycles in order to match the searched word and stored in the assigned register that how many times it appeared in the input statement. A "variable" will count the number of searched word and its indexes as well in the given statement. Afterwards, it will print the result of how many times the word matched and print array of indexes.

Test Cases





B. Test Case

I picked up three words in order to check my design code's result. I intentionally used upper and lower case for the three different input in order to make sure that this design code get the searched word for any type of input given by the user. In addition, this design code get the indexes of the searched word as well and it tells you that where the input word was found within the statement. I executed the program three times and I used KnIgHt, UcF and, MasCot in order to test my case. Every time I get the expected output on the screen which I snapshot and inserted in one of the boxes.

Memory Bit-Cells

Triple modular redundancy also known as TMR is a system created to perform redundancy tasks. In particular TMR uses three different systems to process and perform a voting system which produces output results. Reliability is impeccably important while using the TMR system. NASA defines reliability as the probability of a particular device that can adequately perform during certain conditions. Specifically, reliability helps determine just how well a system operates during various conditions that it encounters. In my particular project I am determining the use of various characteristics while using the MIPS program. This program will allow my project to determine what type of characters are being used and inserted by the user.

A benefit of using reliability calculations is that they automatically insert and determine how a program would operate under the worst of conditions. In other words, reliability calculations will almost certainly encompass some sort of error within their margins. They will also determine if the programs or modules being tested will all logistically fail in the same direction, or go in various different routes of errors. The use of TMR in comparison to NMR is that it is able to measure units of time. While using the TMR approach in comparison to an NMR approach the tradeoff is significant. The TMR approach actually leaves room for more error to occur. Critical data paths used during TMR operations are unable to compute everything that is inputted. TMR's are reliable for only computing numerical operations. The reliability of these programs decreases while using TMR. The most accurate system would then be the use of adaptive voting. The system of adaptive voting is efficient because the system itself compares results with the module at hand and the outputs of that said module. If a particular output fails then it is removed on its own. Once the bad modules are removed than the good modules are able to be re input within the system by the use of hybrid redundancy. It is due to this automatic use of inputs and output replacement why as engineers we use the Voting TMR approach. The Voting TMR approach is able to be reliable with computer systems using numerical values and is built in such a manner that it can compete with faulty outputs.

II. Results and Discussion

Following are the instruction statistics from my design. ALU(.40%), Branch(24%), Jump (13%), Memory (18%) and, others (4%). Once I got this percentage then I applied the total energy consumption formula

1) *ALU = 1 fJ*
2) *Branch = 3 fJ*
3) *Jump = 2 fJ*
4) *Memory = Refer to Table I*
5) *Other = 5 fJ*

Table I: Energy consumption for a single bit-cell memory in the designs provided in [1-3].

Design	Energy consumption of a Single Bit-Cell Memory
SEU-Latch [1]	0.88 fJ
DNU-Latch [1]	0.28 fJ
[2]	6.96 fJ
[3]	1.51 fJ

Total energy consumption

1) 1(.40)+3(.24)+2(.13)+.88(.18)+5(.04)
2) 1(.40)+3(.24)+2(.13)+.28(.18)+5(.04)
3) 1(.40)+3(.24)+2(.13)+6.96(.18)+5(.04)
4) 1(.40)+3(.24)+2(.13)+1.51(.18)+5(.04)

Given below are the results for the calculation that was done

Table II: Total Energy consumption for the assembly program using designs provided in [1-3].

Design	Total Energy Consumption
SEU-Latch [1]	1.74 fJ
DNU-Latch [1]	1.63 fJ
[2]	2.83 fJ
[3]	1.85 fJ

III. Conclusion

In conclusion various engineering and computing techniques all have their benefits and hardships that must be faced. NMR techniques are reliable because they calculate the results while faced with the most difficult operating conditions. TMR is useful as well as it automatically will take out the modules that are not computing well in terms of dealing with faulty outputs as well. Each technique and system of computing will hold some percentage of error as nothing is ever considered to be 100% accurate. This project taught me the different uses for MPIS, NMR, TMR, Voting Systems, and use of Redundancy and Reliability.

References

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