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| Velocity unit : Task / Time => Time is in hours | Estimated Velocity | Actual Velocity |
| **[2] Read the assembly source le (assume the le is validated and exists)** |  |  |
| (a) Open the source file in read mode. | 1.5 | 1.25 |
| (b) Create and open a le input stream. | 0.5 | 0.25 |
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| **[3] Scan characters to extract and create tokens** |  |  |
| (a) Create a symbol table (for labels and mnemonics). | 3 | 3.5 |
| (b) Enter mnemonics (keywords) in the symbol table. | 1 | 0.5 |
| (c) Read characters from the input stream. | 0.5 | 0.5 |
| (e) Skip white spaces. | 0.5 | 0.25 |
| (g) Scan identiers (no labels yet, only mnemonics). | 5 | 7.75 |
| (j) Return token to parser. | 2 | 0.5 |
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| **[4] Parse tokens and generate an intermediate representation (IR).** |  |  |
| (a) Create an IR (array or list of line statements). | 5 | 5 |
| (b) Parse an assembly unit (a sequence of line statements until the end of le is reached). | 3 | 7 |
| (c) Parse a line statement and add it to IR. | 3 | 1 |
| iii. Parse an inherent instruction. | 2 | 3 |
| (h) Parse an end of line. | 0.5 | 0.25 |
| (i) Parse an end of file and return the IR to the back end (code generator). | 1.5 | 4 |
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| **[7] Generate a listing File** |  |  |
| (a) Traverse the IR using the symbol table. | 5 | 3 |
| (b) Create the format header of a line statement: Line Addr Code Label Mne Operand Comment. | 1.5 | 0.5 |
| (c) Create the inherent instruction formatter: Mne. | 1 | 1 |
| (f) Generate the opening of a line statement in a listing le (Line Addr Code). | 1.25 | 0.75 |
| (g) Generate the closing of a line statement in a listing le (Label Mne Operand Comment). | 1 | 2 |
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| **Testing for :-** |  |  |
| *[2] Read the assembly source le (assume the le is validated and exists)* | 2 | 2 |
| *[3] Scan characters to extract and create tokens* | 10 | 15 |
| *[4] Parse tokens and generate an intermediate representation (IR).* | 8 | 10 |
| *[7] Generate a listing File* | 7 | 7.5 |
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