#### Non-Functional Validation

System response time and CPU and Memory resource utilization were verified during non-functional validation process. We used Microsoft Windows 10 with Intel(R) Core(TM) i3 CPU 2.40 GHz, 3.0 GB of RAM.

Following are the average values taken on 10 readings (1 reading consist of input and corresponding output):

Average Response time: 679 ms

Average CPU utilization: 1.49%

Average Memory utilization: 28 MB

### Testing

We used four testing strategies to test our system (See Figure):



Figure 4.3.2

These strategies are discussed in detail below:

#### Black box Testing

We tested the functionality of our system regardless of any implementation and code details through black box testing. A test case was generated in order to test valid output against valid input( See Figure).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Speech to Text Test Case** | | | | |
| **Description:** | Test case to check Speech to Text Conversion | | | |
| **No.** | **Valid Input** | **Invalid Input** | **Output for Valid Input** | **Output for Invalid Input** |
| 1 | Clearly Spoken Sentence | Unclearly Spoken Sentence | Correct Conversion to text | Incorrect conversion to text |

#### White box Testing

We did extensive white box testing to optimize non-functional requirements of our system. Code was analyzed in order to improve resource allocation and memory leaks. Input/output resource allocation, CPU allocation and RAM allocation were specifically kept in mind during this testing phase.

#### Unit Testing

All modules of our system were tested individually to make sure that there is no ambiguity in flow to program and that all modules are working properly. After this process we were confident that all modules are working as expected and they are ready to be integrated with each other.

#### System Testing

After making sure that all modules are working properly, we integrated them together and then tested our system thoroughly to make sure that all modules are working properly when connected as a whole. We searched and resolved bugs to make our system’s performance consistent.