**1. System Requirements**

1.1 Functional Requirements

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| Spec ID | Spec Type | Spec Description |
| In-001 | Input | The user will input the amount of time they want to spend on this task. This task can be writing or composing music. |
| Out-008 | Output | Show the current state of Tasker’s timer. |
| PR-019 | Output | Notify the user when they are done with their task. This means when productive time has reached the goal. |
| In-021 | Input | The user will be able to create a commitment to play music, write or draw for an amount of time they’ll specify. Such as from 1 hour/day to 4 times/week. |
| In-002 | Input | The user will select what type of task they want to time themselves doing—writing, music or drawing. |
| In-006 | Input | Timed Task(s) will be saved for future analysis. |
| In-023 | Output | The user will be able to view their commitments. |
| Out-010 | Output | Show the current progress for a specific task(writing, composing music or drawing) for the past week. |
| Out-011 | Output | Show the current progress for a specific task(writing or composing music) for the past month. |
| Out-012 | Output | Show the current progress for a specific task(writing or composing music,) for the past year. |
| Out-013 | Output | Plot in graphs the current progress for a specific task(writing, composing music, or drawing) for the past year. |
| Out-014 | Output | Plot in graphs the current progress for a specific task(writing or composing music) for the past month. |
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1.2 Non-Functional Requirements

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| SPEC ID | Spec Type | Spec Description |
| Out-025 | Output | The user will be able to their progress on a per-session basis. |
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**2.Test Design**

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| Test Case ID | T01 |
| Purpose | Test the correctness of a new Task |
| Pre-Conditions | There must be a name and list of listeners available |
| Inputs | Name, list of listeners |
| Expected Outputs | None |
| Post-conditions | A new Task is instantiated |
| Design Technique | reviewing requirement |

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| Test Case ID | T02 |
| Purpose | Test the correctness of a new session |
| Pre-Conditions | There must be a session length and task to start(instantiate) a new session. |
| Inputs | A task, the length of the goal in seconds |
| Expected Outputs | None |
| Post-conditions | A new Session is instantiated |
| Design Technique | reviewing requirement |

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| Test Case ID | T03 |
| Purpose | Test a new session with a negative number |
| Pre-Conditions | There must be a negative session length and task to start(instantiate) a new session. |
| Inputs | A task, the length of the goal in seconds |
| Expected Outputs | None |
| Post-conditions | A new Session is instantiated with a goal length of 0. |
| Design Technique | Boundary Analysis |

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| Test Case ID | T04 |
| Purpose | Test a new session with a positive number |
| Pre-Conditions | There must be a positive session length and task to start(instantiate) a new session. |
| Inputs | A task, the length of the goal in seconds |
| Expected Outputs | None |
| Post-conditions | A new Session is instantiated with a goal length of the positive value passed. |
| Design Technique | Boundary Analysis |

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| Test Case ID | T05 |
| Purpose | Test the correctness of a commitment |
| Pre-Conditions | The commitment name must not match the name of a pre-existing commitment |
| Inputs | A commitment name, starting date, end date |
| Expected Outputs | None |
| Post-conditions | A new Commitment is instantiated with an end date that is no less than the starting date |
| Design Technique | reviewing requirement |

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| Test Case ID | T06 |
| Purpose | Attempt to start a new commitment with an Invalid starting date. |
| Pre-Conditions | The starting date of the commitment must be earlier(less) than the date of the host OS(Linux). |
| Inputs | A commitment name, starting date, end date |
| Expected Outputs | None |
| Post-conditions | A new Commitment with a starting date that is equal to the date of the host OS, the same as Linux. |
| Design Technique | Boundary Analysis |

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| Test Case ID | T07 |
| Purpose | Attempt to start a new commitment with an Invalid ending date. |
| Pre-Conditions | The ending date of the commitment must be greater than the date of the starting. |
| Inputs | A commitment name, starting date, end date, sessions |
| Expected Outputs | None |
| Post-conditions | A new Commitment with an ending date that is equal to the starting date. |
| Design Technique | Boundary Analysis |

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| Test Case ID | T08 |
| Purpose | Attempt to start a new commitment without any sessions. |
| Pre-Conditions | No sessions exist for this commitment at the moment. |
| Inputs | A commitment name, starting date, end date |
| Expected Outputs | None |
| Post-conditions | A new Commitment without any sessions. The size of the list of commitments should equal 0. |
| Design Technique | Equivalence Class |

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| Test Case ID | T09 |
| Purpose | Test minute conversion with positive seconds |
| Pre-Conditions | Seconds passed to function must be positive |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds in minutes |
| Post-conditions | Number of seconds should be accessible in terms of minutes |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T10 |
| Purpose | Test minute conversion with negative seconds |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of minutes is -1 |
| Post-conditions | Minutes(-1) returned must not be used |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T11 |
| Purpose | Test hour conversion with positive seconds |
| Pre-Conditions | Seconds passed to function must be positive |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of minutes in hours |
| Post-conditions | Number of seconds should be accessible in terms of hours |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T12 |
| Purpose | Test hour conversion with negative seconds |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of minutes is -1 |
| Post-conditions | Minutes(-1) returned must not be used |
| Design Technique | Boundary Analysis |

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| Test Case ID | T13 |
| Purpose | Test Days conversion with positive seconds |
| Pre-Conditions | Seconds passed to function must be postive |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds in Days |
| Post-conditions | Number of seconds should be accessible in terms of days |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T14 |
| Purpose | Test Days conversion with negative seconds |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds is -1 |
| Post-conditions | Minutes(-1) returned must not be used |
| Design Technique | Boundary Analysis |

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| Test Case ID | T15 |
| Purpose | Test Weeks conversion with positive seconds |
| Pre-Conditions | Seconds passed to function must be postive |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds in weeks |
| Post-conditions | Number of seconds should be accessible in terms of days |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T16 |
| Purpose | Test Weeks conversion with negative seconds |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds is -1 |
| Post-conditions | Minutes(-1) returned must not be used |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T17 |
| Purpose | Test months conversion with positive seconds |
| Pre-Conditions | Seconds passed to function must be positive |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds in months |
| Post-conditions | Number of seconds should be accessible in months |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T18 |
| Purpose | Test months conversion with negative seconds |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Number of seconds to convert |
| Expected Outputs | Number of seconds is -1 |
| Post-conditions | Minutes(-1) returned must not be used |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T19 |
| Purpose | Calculate percentage for productive time with negative time |
| Pre-Conditions | Seconds passed to function must be negative |
| Inputs | Total seconds, productive seconds |
| Expected Outputs | Number of seconds is -1.0 |
| Post-conditions | Minutes(-1.0) returned must not be used |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T20 |
| Purpose | Calculate percentage for productive time with positive time |
| Pre-Conditions | Seconds passed to function must be positive |
| Inputs | Total seconds, productive seconds |
| Expected Outputs | The percent that the user is being productive |
| Post-conditions | The user should have access to to the percent of productive time |
| Design Technique | Boundary Analysis |

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| Test Case ID | T21 |
| Purpose | Validation of input values: secondsTotal and secondsProductive |
| Pre-Conditions | secondsProductive must be less than or equal to secondsTotal; secondsTotal and secondsProductive must be of positive magnitude |
| Inputs | secondsTotal: total number of seconds in a session; secondsProductive: total number of productive seconds, out of secondsTotal |
| Expected Outputs | Percentage of productive time, -1.0 if secondsTotal and/or secondsProductive fail input validation |

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| Test Case ID | T22 |
| Purpose | Check the accuracy of Timer::getRealTimeLeft() in the case of no listeners |
| Pre-Conditions | A Timer object is created, RealTime set to 15 min |
| Inputs | none |
| Expected Outputs | getRealTimeLeft() returns within 1 second of 5 minutes (test takes 10 min) |
| Post-conditions | none |
| Design Technique | Requirement Review |

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| --- | --- |
| Test Case ID | T23 |
| Purpose | Check the accuracy of Timer::getProductiveTimeLeft() in the case of no listeners |
| Pre-Conditions | A Timer object is created, RealTime and ProductiveTime set to 15 min |
| Inputs | none |
| Expected Outputs | getProductiveTimeLeft() returns within 1 second of 5 minutes (test takes 10 min) |
| Post-conditions | none |
| Design Technique | Requirement Review |

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| --- | --- |
| Test Case ID | T24 |
| Purpose | Check that Timer::setProductiveTime(); accepts positive value times, like 1:00:00 (1 hour) |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getProductiveTimeLeft() returns 1 hour |
| Post-conditions | none |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T25 |
| Purpose | Check that Timer::setProductiveTime(); doesn’t accept negative value times, like -1:00:00 (-1 hours) |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getRealTime() returns 0 seconds, 0 min |
| Post-conditions | none |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T26 |
| Purpose | Check that Timer::setRealTime(); accepts positive value times, like 1:00:00 (1 hour) |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getRealTime() returns 1 hour |
| Post-conditions | none |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T27 |
| Purpose | Check that Timer::setRealTime(); doesn’t accept negative value times, like -1:00:00 (-1 hours) |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getRealTime() returns 0 seconds, 0 min |
| Post-conditions | none |
| Design Technique | Boundary Analysis |

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| --- | --- |
| Test Case ID | T28 |
| Purpose | Check the accuracy of Timer::getUnproductiveTime() in the case of no listeners |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getUnproductiveTime() returns 0 seconds, 0 min (test takes 10 min) |
| Post-conditions | none |
| Design Technique | Requirement Review |

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| --- | --- |
| Test Case ID | T29 |
| Purpose | Check the accuracy of Timer::getProductiveTime() in the case of no listeners |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getProductiveTime() returns within 1 second of 10 minutes (test takes 10 min) |
| Post-conditions | none |
| Design Technique | Requirement Review |

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| --- | --- |
| Test Case ID | T30 |
| Purpose | Check the accuracy of Timer::getRealTime() |
| Pre-Conditions | A Timer object is created |
| Inputs | none |
| Expected Outputs | getRealTime() returns within 1 second of 10 minutes (test takes 10 min) |
| Post-conditions | none |
| Design Technique | Requirement Review |

3. Traceability

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| Test Case Number | List of the Requirements tested |
| T01 | In-001, In-002, In-006 |
| T02 | Out-025 |
| T03 | Out-025 |
| T04 | Out-025 |
| T05 | In-021, In-023 |
| T06 | In-021, In-023 |
| T07 | In-021, In-023 |
| T08 | In-021, In-023 |
| T09 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T10 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T11 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T12 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T13 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T14 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T15 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T16 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T17 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T18 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T19 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T20 | Out-010, Out-011,Out-013, Out-014, Out-015 |
| T21 |  |
| T22 | PR-19, Out-008 |
| T23 | PR-19, Out-008 |
| T24 | Out-008 |
| T25 | Out-008 |
| T26 | Out-008 |
| T27 | Out-008 |
| T28 | Out-008, PR-019, |
| T29 | Out-008, PR-019, |
| T30 | PR-019, Out-008 |