

Summary

ThymeBoxer is an original design for a mobile productivity app based on the concept of “time boxing,” which is essentially a combination to-do list and daily calendar. Unlike a traditional to-do list, time boxing focuses on accomplishing tasks within specific time windows. A “timed” mode enables stopwatch timing of each task in place of scheduling.

In the spirit of gamifying productivity, a user-defined reward system is included, with points granted for each task based on the difficulty level and time spent.

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Database Schema

Settings Table (DataStore)

Field Name	Label	Type	Description
id [PK]	N/A	Int	Primary key
listMode	List Mode	Byte	1 = scheduled, 2 = timed
backlogSortMode	N/A	Byte	1 = Newest to Oldest [default] 2 = Oldest to Newest 3 = Priority - Highest to Lowest 4 = Priority - Lowest to Highest 5 = Difficulty - Easiest to Hardest 6 = Difficulty - Hardest to Easiest 7 = Duration - Shortest to Longest 8 = Duration - Longest to Shortest 9 = Custom
darkMode	Dark Mode	Boolean	True = dark, False = light [default]
displayNotes	Display Notes in Task List	Boolean	Default to False
expandSubtasks	Expand Subtasks	Boolean	Default to True
swipeToDelete	Swipe to Delete	Boolean	Default to True
hideCompleted	N/A	Boolean	Set by Hide/Show Completed toggle
defaultTime	Default Time	Byte	1 = Earliest [default], 2 = Latest
defaultDuration	Default Duration	Byte	5 – 60 minutes
timeIncrement	Time Increment	Byte	5, 10, or 15 minutes
rewardPlatinum	Platinum	Int	Default 300; maximum 500
rewardGold	Gold	Int	Default 250; maximum 500
rewardSilver	Silver	Int	Default 200; maximum 500
rewardBronze	Bronze	Int	Default 150; maximum 500
weekend	Weekend	Set of days	Stores days considered off work or school
syncTasks	Sync Scheduled Tasks to Calendar	Boolean	Premium feature; default to False
syncAppointments	Sync Appointments to Calendar	Boolean	Premium feature; default to True

ListItem Table

Each record in this table represents a single task or appointment.

Field Name	Label	Type	Description
id [PK]	N/A	Int	Primary key
recurringTemplateId [FK]	N/A	Int	Foreign key
sortOrder	N/A	Int	Stores the position of this row
itemType	Task or Appointment	Byte	1 = Task, 2 = Appointment
listDate	N/A	LocalDate	Date where item appears (null if backlog)
description	Description	String (40)	Required; stop input at character limit
notes	Notes	String (500)	Optional; stop input at character limit
dueDate	Due Date	LocalDate	Optional
startTime	Time	LocalTime	Scheduled time or when timer is started
notification	Notification	Boolean	Default to False
notificationTiming	N/A	Byte	Displayed in minutes; default to 10
pin	Pin	Boolean	Task is kept in the Pinned section at the top
duration	Duration	LocalTime	Default to Default Duration in Settings
elapsedDuration	N/A	LocalTime	Displayed on task row when in Timed mode
difficulty	Difficulty	Byte	1, 2, or 3; default to 2
rewardPoints	Reward Points	Float	Total points awarded for completing task
priority	Priority	Byte	1, 2, 3, or 4; default to 1 (no priority)
dateCreated	N/A	LocalDate	
dateCompleted	N/A	LocalDate	
isArchived	N/A	Boolean	False = Active, True = Archived

SubTaskItem Table

Each record in this table represents a single subtask which is linked to a record in the *ListItem* table.

Field Name	Label	Type	Description
id [PK]	N/A	Int	Primary key
listItemId [FK]	N/A	Int	Foreign key
description	Description	String (40)	Required; stop input at character limit
completed	N/A	Boolean	

RecurringTemplate Table

Each record in this table represents a template for a recurring task and is linked to a record in the *ListItem* table.

Field Name	Label	Type	Description
id [PK]	N/A	Int	Primary key
description	N/A	String (40)	Required; stop input at character limit
notes	N/A	String (500)	Optional; stop input at character limit
defaultDuration	N/A	LocalTime	Default to 30 minutes
defaultTime	N/A	LocalTime	<i>Required</i> for Tasks in Scheduled mode <i>Unavailable</i> for Tasks in Timed mode <i>Required</i> for Appointments in both modes Based on Default Time in Settings
notification	Notification	Boolean	Default to Off
notificationTiming	N/A	Byte	Displayed in minutes; default to 10
difficulty	N/A	Byte	1, 2, or 3
priority	N/A	Byte	1, 2, 3, or 4
recurring	N/A	String (255)	RRULE key-value pairs; null = inactive
pinned	N/A	Boolean	Task is kept in the Pinned section at the top
dateCreated	N/A	LocalDate	

RecurringSubTaskTemplate Table

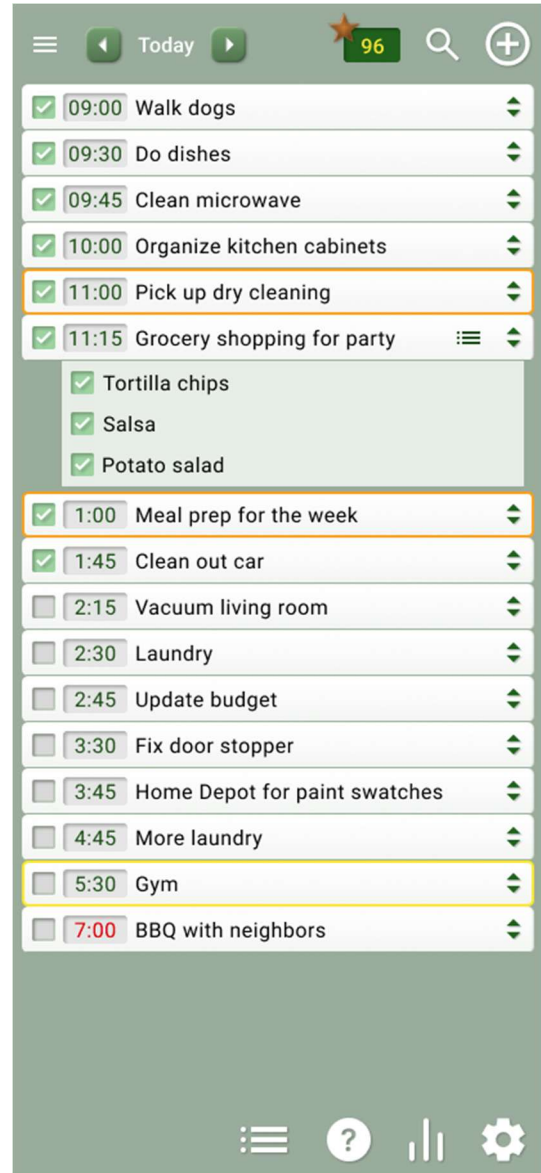
Each record in this table represents a single subtask which is linked to a record in the *RecurringTemplate* table.

Field Name	Label	Type	Description
id [PK]	N/A	Int	Primary key
recurringTemplateId [FK]	N/A	Int	Foreign key
description	Description	String (40)	Required; stop input at character limit
completed	N/A	Boolean	

Interface

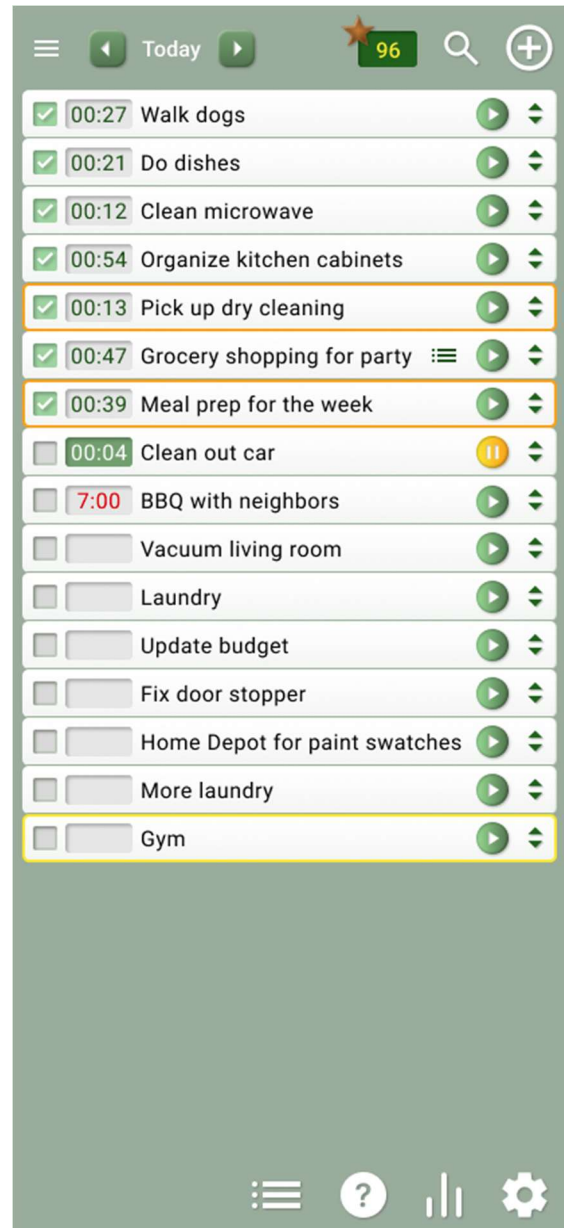
Main Screen – Scheduled Mode

- The top bar displays either **Today** or (if not the current day) a date. Default to the current day.
- Arrows are displayed on either side of the “Today” text to move forward or back one day.
- Tapping on “Today” or the date opens a calendar.
- A reward points readout is displayed in the upper right, based on the total of completed tasks for the day. Reward points are calculated for each task as $difficulty * elapsedDuration / \text{the number of 5-minute increments}$. For example, in scheduled mode, a moderately difficult task with a 30-minute duration would be $2 * 30 / 5 = 12$.
- Tapping the  icon or tapping on a task row opens the New Task / Edit Task screen shown on page 9.
- The main list displays:
 - All tasks and appointments with a *listDate* of the day being viewed and where *isArchived* is false; including recurring tasks set for that day.
 - Both complete and incomplete tasks.
- Lower right corner:
 - Backlog icon opens the Backlog screen.
 - Help icon opens the main help screen.
 - Report icon opens a chart screen with reward points graph over time.
 - Gear icon opens the Settings screen.
- Task row:
 - Tap to open the Edit Task screen for that task.
 - If task priority is 2, 3, or 4, frame task with the associated priority color.
 - Move tasks by dragging the arrow icons on the far right. This will adjust the time for that task and all rows below it, with the exception of appointments. If an appointment is encountered when moving a row, the appointment time range is unavailable, and other affected rows will compensate.
- When a moved task is dropped, set time to the slot following the duration of the task above it.
- Tapping the  icon expands or closes the subtasks associated with that row. The Expand Subtasks setting determines the initial state.
- Check the box to complete the task. Marking a task complete:
 - Determines if there are incomplete subtasks. If any subtasks have not been completed, display a dialog reading “This task contains incomplete subtasks. Do you want to mark them all as complete?” with **Complete All**, **Leave Incomplete**, and **Cancel** buttons.
 - Saves the duration in *ListItem.elapsedDuration* [used for reporting].
 - Updates the *ListItem.dateCompleted* with the current date. The same holds true for recurring tasks (the *RecurringTemplate* table is unaffected).
 - Calculates reward points as $difficulty * elapsedDuration / 5$, then saves that number in *ListItem.rewardPoints*.
 - Adds the reward points for this task to the total reward points for the day and updates the display at the top of the screen. If total reward points pass the threshold for any award, show confetti animation and update the icon shown in the upper right.
- Unchecking an already completed task will set *ListItem.dateCompleted* to null and subtract the associated reward points from *ListItem.rewardPoints*.



Main Screen – Timed Mode

- Timed mode (configured in Settings) is nearly identical to Scheduled mode, but instead of scheduling tasks, a stopwatch function allows the user to time each one. In Timed mode, tasks do not have a scheduled time—only an estimated duration and an elapsed duration.
- In this mode, the task list will display all *ListItem* records where *listDate* equals today, as well as any records where *dueDate* equals today (tasks and appointments).
- Sorting in Timed mode:
 - Pinned items will appear at the top in the Pinned Tasks section.
 - Uses the existing *ListItem.sortOrder* (already used for backlog custom ordering) as the manual-order key for unscheduled tasks.
- Appointments are still scheduled, with the time appearing in red text.
- The play button on each row starts the timer, and changes to a pause button while the timer is running.
 - Saves the current time in *ListItem.startTime*.
 - If a timer is already running for one task and another timer is started on a different task, pause the timer on the first task.
- Marking a task complete:
 - Determines if there are incomplete subtasks. If any subtasks have not been completed, display a dialog reading “This task contains incomplete subtasks. Do you want to mark them all as complete?” with **Complete All**, **Leave Incomplete**, and **Cancel** buttons.
 - Stops the timer and saves the duration in *ListItem.elapsedDuration*. If the timer was never started, use the planned duration.
 - Updates the corresponding record in *ListItem.dateCompleted*.
 - Calculates reward points as $\text{difficulty} * \text{elapsedDuration} / 5$, then saves that number in *ListItem.rewardPoints*.
 - Adds the reward points for this task to the total reward points for the day and updates the display at the top of the screen. If total reward points pass the threshold for any award, show confetti animation and update the icon shown in the upper right.



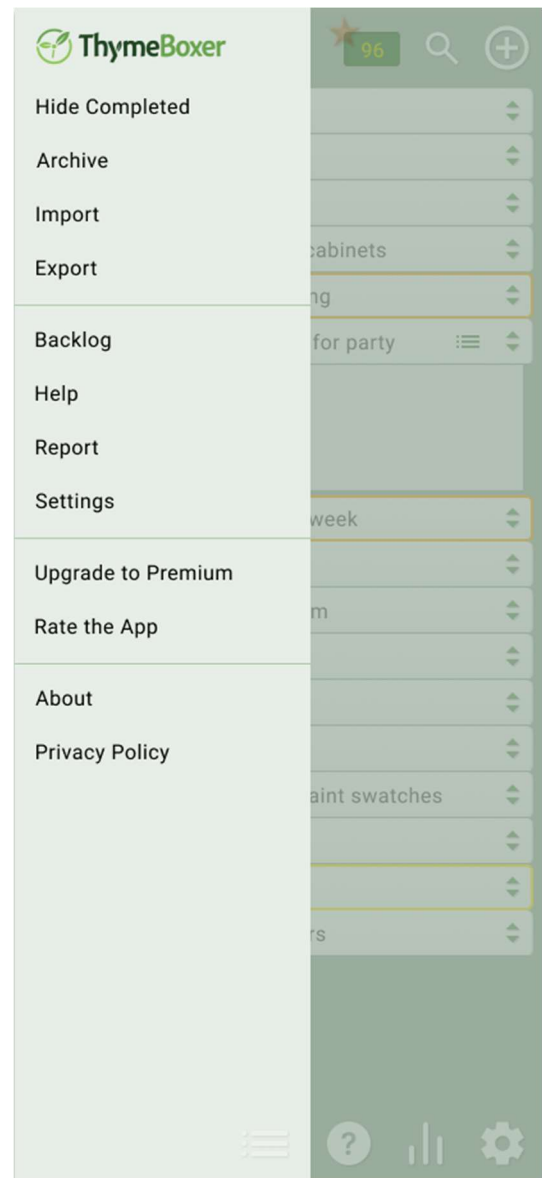
Note that in both Scheduled and Timed modes the check box on any task or appointment row can be unchecked (marked as incomplete) after it has already been completed. In the case of Timed mode, the timer may then be restarted.

Switching from Timed mode to Scheduled mode in Settings will result in existing tasks (which would not have a start time) having a start time assigned automatically, using *ListItem.duration* and processed in their existing *ListItem.sortOrder* sequence.

Switching from Scheduled mode to Timed mode will have no effect on existing start times, which will still be stored in the *ListItem* table. New tasks created in Timed mode will not have start times.

Main Screen – Menu

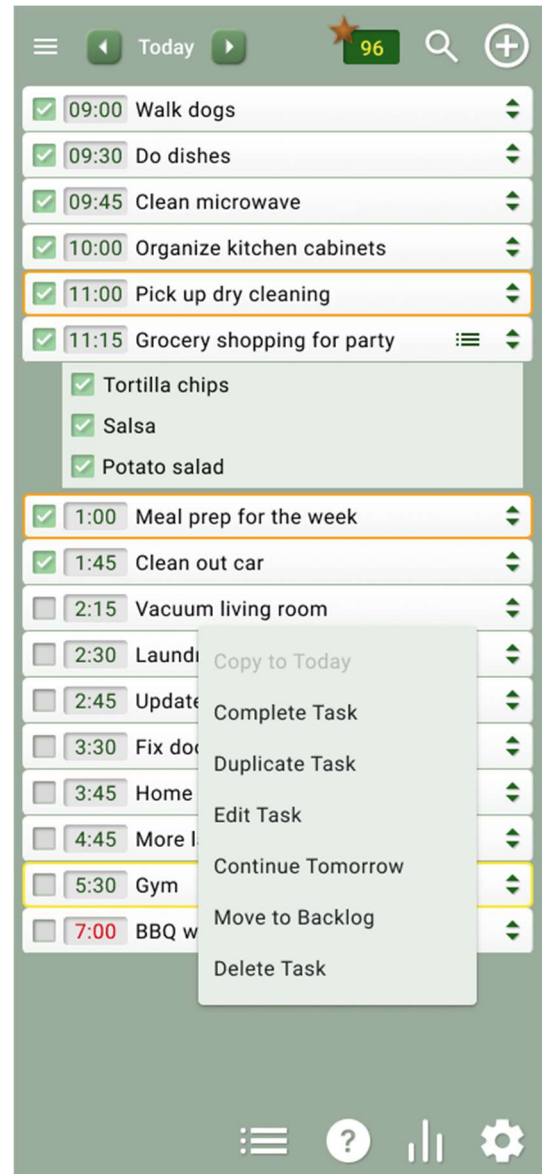
- **Hide Completed/Show Completed**
 - Toggles between the two states.
 - If Hide Completed is active when a task is marked completed, that row will fade out over 2 seconds.
 - This setting is saved for the next session in the *Settings* DataStore.
- **Archive**
 - A popup allows selecting a date range.
 - *ListItem.isArchived* is set to True for the selected records.
- **Import**
 - A popup allows selecting a file to import.
- **Export**
 - A popup allows selecting a date range to export.
- **Backlog**
- **Help**
- **Report**
- **Settings**
- **Upgrade to Premium**
- **Rate the App**
- **About**
- **Privacy Policy**



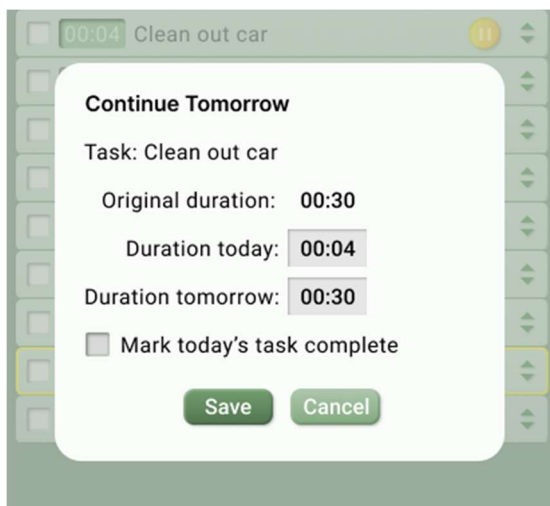
Main Screen – Long-Press Task

The menu includes the following selections:

- **Copy to Today** [only available when displaying task list for dates other than current day]
 - This should duplicate the task for today and leave the original.
- **Complete Task** or **Complete Appointment**
- **Duplicate Task** or **Duplicate Appointment**
- **Edit Task** or **Edit Appointment** [same functionality as short-press on task]
- **Continue Tomorrow** popup displays the following:
 - Task description
 - Original [planned] duration
 - Duration today [editable; defaults to original duration or elapsed time if using Timed mode]
 - Duration tomorrow [editable; defaults to original planned duration]
 - Checkbox for **Mark today's task complete**
 - **Save** and **Cancel** buttons
 - Task will be duplicated for the following day with specified duration
- **Move to Backlog**
 - Item will be removed from this screen and added to the backlog [*listDate* removed from this record in the *ListItem* table].
 - In the case of appointments, display a popup dialog reading “This is an appointment. Moving it to the backlog will remove the appointment date. Are you sure?” with **Yes** and **Cancel** buttons.
- **Delete Task** or **Delete Appointment**
 - The row will be deleted, and then a snackbar will appear at the bottom of the screen for 5 seconds: “Task [or Appointment] deleted” with an **Undo** link.

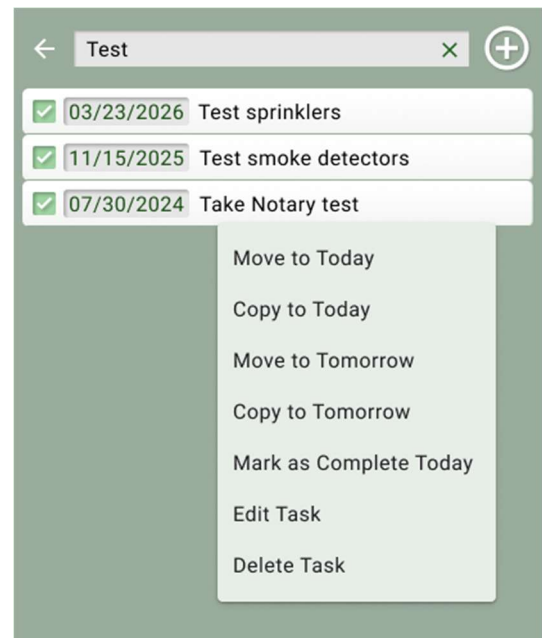
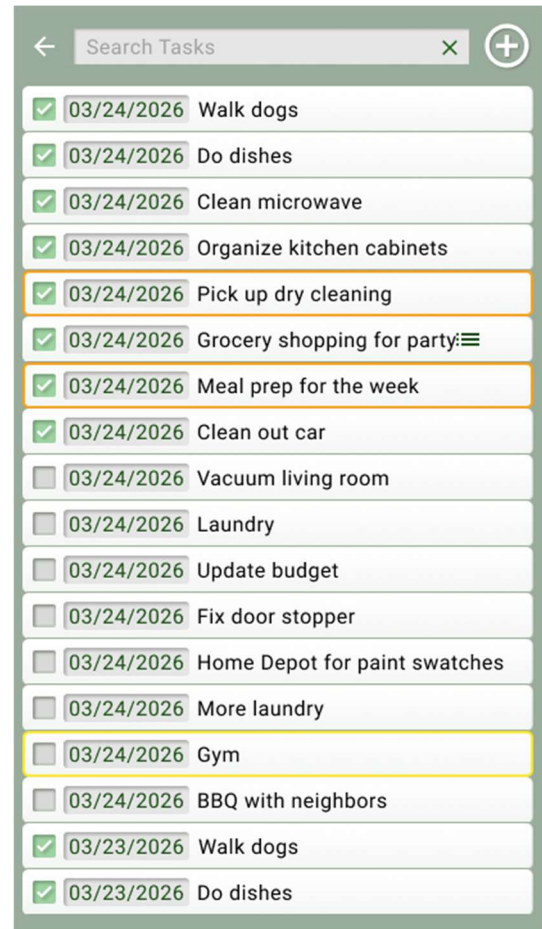


Continue Tomorrow Popup:



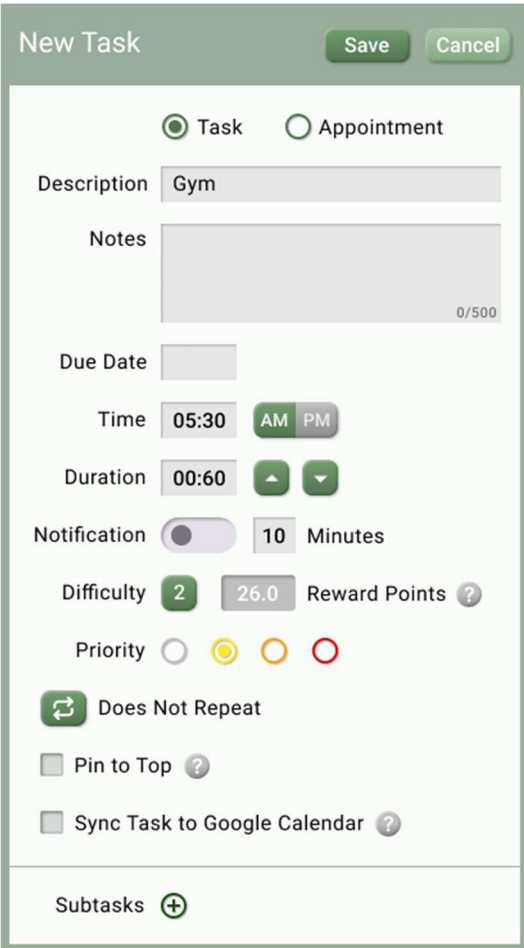
Main Screen – Search

- Tapping the  icon on the main screen opens the search entry field, which temporarily hides the main menu, date, reward points display, and search icon.
- Search functionality is available in both Scheduled and Timed modes. This feature excludes items found in the backlog, which has its own distinct search function.
- This is an “instant search,” updating the results as the user enters each character. Use a virtualized/recycled list for fast loading of the initially displayed rows.
- Rows are sorted by date descending.
- Tapping the  icon returns the user to the main screen.
- Tapping the  icon clears the search entry field.
- Tapping a task row opens the Edit Task screen.
- The long-press menu includes the following selections:
 - **Move to Today** [only available for tasks with dates other than current day]
 - **Copy to Today** [only available for tasks with dates other than current day]. This should duplicate the task for today and leave the original.
 - **Move to Tomorrow**
 - **Copy to Tomorrow** - this should duplicate the task for tomorrow and leave the original.
 - **Mark as Complete Today** [only available for incomplete tasks with dates other than current day]. This is equivalent to moving the task to today and then marking it complete.
 - **Edit Task** or **Edit Appointment** [same functionality as short-press on task]
 - **Delete Task** or **Delete Appointment**
 - The row will be deleted, and then a snackbar will appear at the bottom of the screen for 5 seconds: “Task [or Appointment] deleted” with an **Undo** link.



New Task / Edit Task

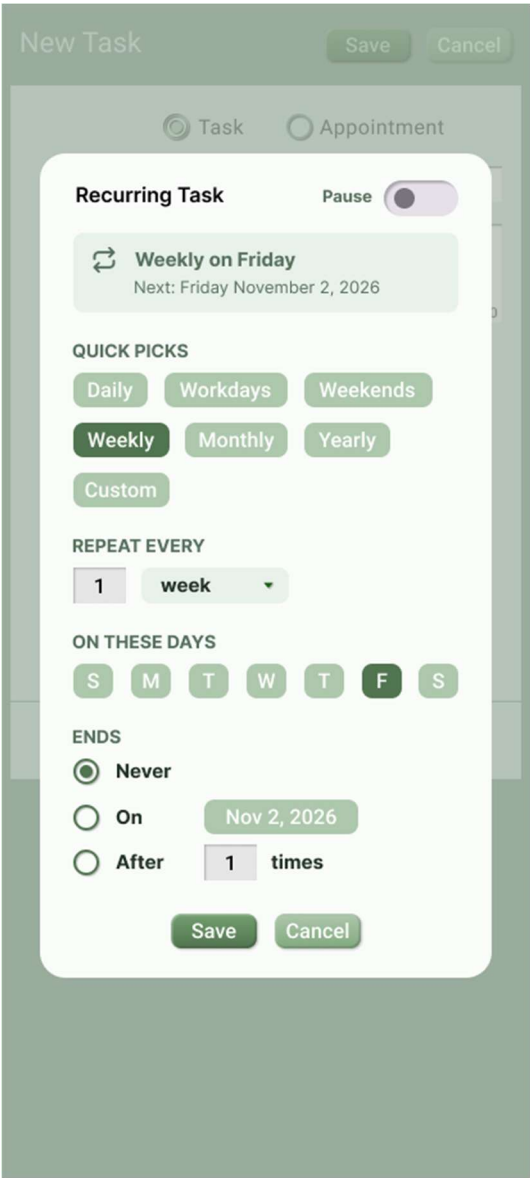
- When the  icon is tapped on the main task list screen, the top bar will display “New Task”. When a task row is tapped in the list, the top bar will display “Edit Task”.
- Task** and **Appointment** radio buttons; default to Task.
- Description** [required]
- Notes** [optional]
- Due Date** [optional for tasks and required for appointments]
 - Default to null for tasks.
 - Tapping on this field opens a date picker.
 - Note that appointments will only appear in the main task list on the due date and cannot be moved by dragging.
- Time**
 - Required if **List Mode** is *Scheduled* and type is *Task*. Uses the value in *Settings.defaultTime*.
 - Hidden if **List Mode** is *Timed* and type is *Task*.
 - Required for appointments regardless of mode.
 - Upon tapping out of this field, determine if there are time conflicts with any appointments for the day or tasks in Scheduled mode. If so, display a warning dialog reading “this time conflicts with <task description> scheduled for <time>”. Automatically select an available time slot?” with **Yes** and **Cancel** buttons.
- Duration** [Scheduled mode] / **Est. Duration** [Timed mode] defaults to *Settings.defaultDuration*, with a minimum value of 00:05.
 - Arrow buttons increment or decrement by the value in *Settings.timeIncrement*.
- Notification** defaults to off and 10 minutes.
- Difficulty**
 - Displays number 1, 2, or 3. The default is 2.
 - 1 = “Easy,” 2 = “Moderate,” 3 = “Difficult.”
 - Tapping the Difficulty button opens a dialog with radio buttons for *Easy*, *Moderate*, and *Difficult*.
 - Selecting any difficulty level (even the current difficulty level) closes the dialog and updates the Difficulty button display.
- Reward Points** field is read-only. This displays the result of difficulty level * the number of 5-minute increments. For example, a moderately difficult task with a 30-minute duration would be $2 * 30 / 5 = 12$.
- Priority**
 - Four colors—gray (default; no priority), yellow, orange, red.
 - In storage, Gray = 1, Yellow = 2, Orange = 3, and Red = 4.
- Recurring** – See the following page.
- Pin to Top** check box will cause that row to appear in the Pinned Tasks section at the top of the main list.
- Sync Task to Google Calendar** [tasks] / **Sync Appointment to Google Calendar** [appointments]. Default is based on *Settings.syncTasks* and *Settings.syncAppointments*.
- Tapping any  button opens a popup with the associated context-sensitive help topic (page 18).
- Upon **Save**:
 - Check for conflicting appointments and pinned tasks where due date, time, and/or duration overlap with another. If there is a conflict, display a popup warning “The date, time, or duration conflict with the following:” followed by the description, due date, time, and duration of the conflicting appointment(s).
 - Update the *ListItem* table with changes and return to the main screen.



New Task / Edit Task – Recurring Events

- Tapping the  button opens a popup with recurring settings for this event:
 - If the **Task** radio button is selected in the New Task screen, the label of this dialog will read “Recurring Task”. If the **Appointment** radio button is selected, it will read “Recurring Appointment”.
 - The summary card displays the current settings for an existing recurring event, or the default settings for a new recurring event (weekly, current day), as well as the next time the event occurs.
 - The **Pause** toggle defaults to Off. When active, the series ends at the pause date, and a new series starts when it resumes.
 - Tapping the **Save** button writes the RRULE string to *RecurringTemplate.recurring*.
 - Tapping the **Cancel** button closes the dialog without making changes to the *RecurringTemplate* table.
- When editing an existing recurring task, if any settings are changed, display a dialog reading “Make this change to all future instances of this recurring task or only this one?” with buttons for **This instance only**, **This and all future instances**, and **Cancel**.
- When a new recurring task is saved:
 - Insert new record(s) in the *RecurringTemplate* table and the *RecurringSubTaskTemplate* table (if applicable).
- Insert new record(s) in the *ListItem* table and the *SubTaskItem* table for the current day (if applicable, based on the recurring days selections).
- Example states of the New/Edit Task screen recurring status display:

-  Does Not Repeat
-  Weekly on Friday
-  Monthly on Day 1 (Paused)



New Task

Save Cancel

Task Appointment

Recurring Task Pause

Weekly on Friday
Next: Friday November 2, 2026

QUICK PICKS

Daily Workdays Weekends

Weekly Monthly Yearly

Custom

REPEAT EVERY

1 week

ON THESE DAYS

S M T W T F S

ENDS

Never

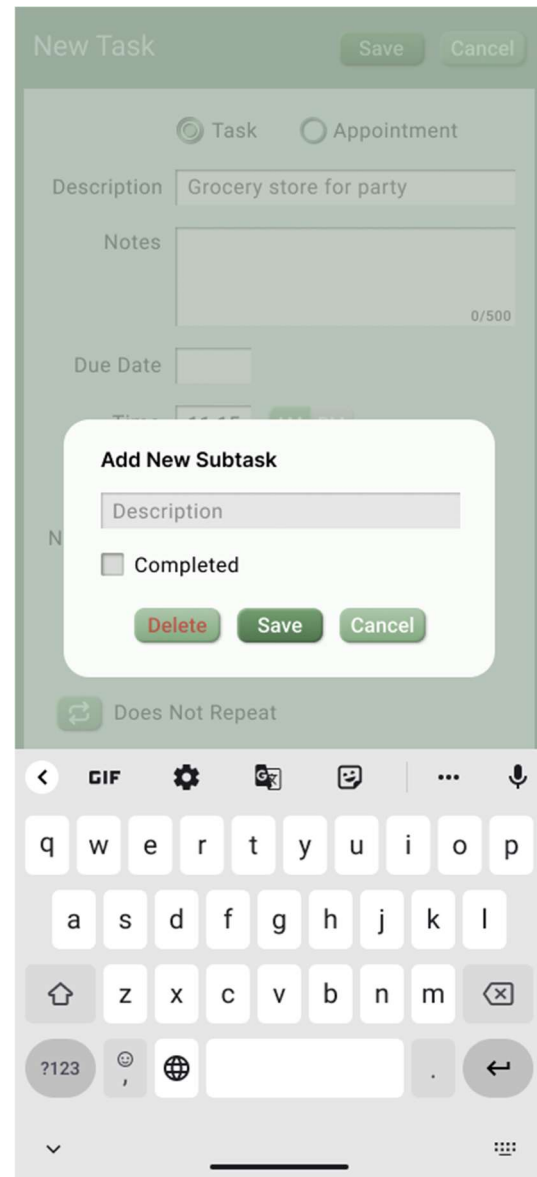
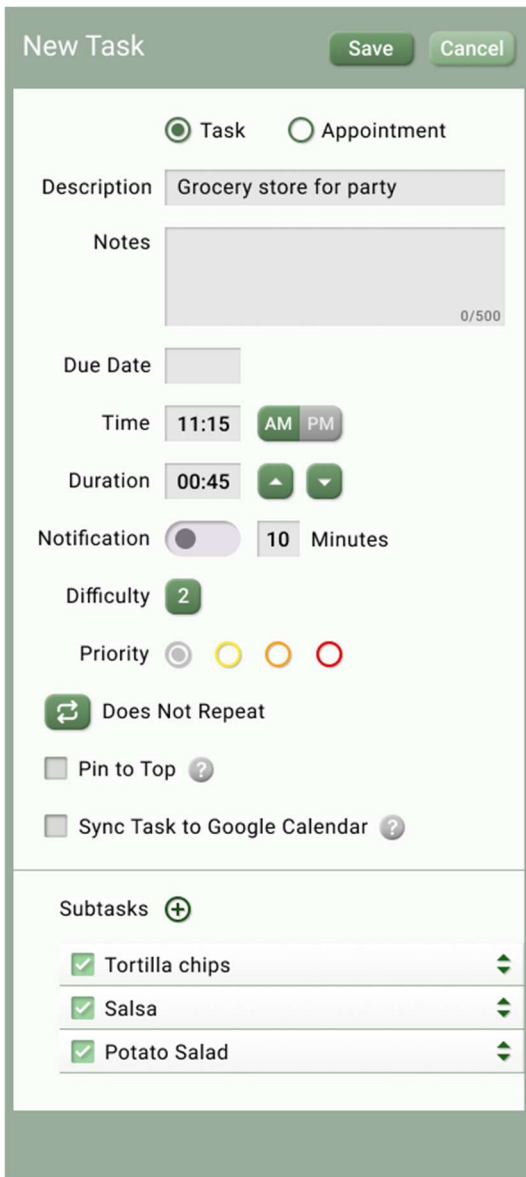
On Nov 2, 2026

After 1 times

Save Cancel

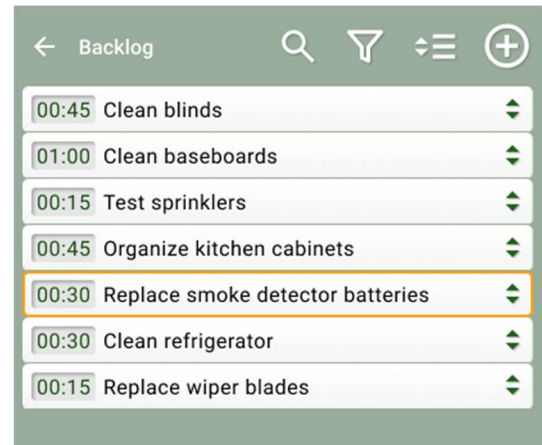
New Task / Edit Task – Subtasks

- Tapping the  icon opens the Add New Subtask dialog.
- If an existing subtask row is tapped instead, the same dialog opens with the title “Edit Subtask”.
- Upon **Save**, write the changes to *SubTaskItem.description* and *SubTaskItem.completed*, then return to the New Task / Edit Task screen.
- Upon **Cancel**, return to the New Task / Edit Task screen.
- Upon **Delete**, the subtask will be deleted, and then a snackbar will appear at the bottom of the screen for 5 seconds: “Subtask deleted” with an **Undo** link.



Backlog

- When the  icon is tapped on the main task list screen, the backlog will appear. This list contains items that were moved from the main list or added from this screen (items with a null *ListItem.listDate*).
- Tapping the  icon or tapping on a task row opens the New/Edit Task screen. When a task or appointment is added or edited from the Backlog screen, specifying a due date for an appointment is optional. If no date is entered, the appointment will remain in the backlog. If a date is entered, the appointment will be created on that date and will not appear in the backlog after saving. This is an intentional exception to the rule on the main screen, where a due date is required for appointments.
- No confirmation dialog or warning is shown when a dated appointment is saved from the backlog—it is assumed the user understands that entering a date will place the appointment on that date's task list rather than in the backlog.
- Task row:
 - Displays the duration and description of each task or appointment (not the time).
 - Tap to open the Edit Task screen for that task.
 - If task priority is 2, 3, or 4, frame task with the associated priority color.
- **Search** enables the same search function found on the main screen, but exclusively for backlog items.
- **Filter** options:
 - **Date Range**
 - **Tasks or Appointments**
 - **Priority**
 - **Difficulty**
 - **Duration**
- **Sort** options [the number in brackets represents the value in *Settings.backlogSortMode*]:
 - [1] **Newest to Oldest** is the default
 - [2] **Oldest to Newest**
 - [3] **Priority – Highest to Lowest**
 - [4] **Priority – Lowest to Highest**
 - [5] **Difficulty – Easiest to Hardest**
 - [6] **Difficulty – Hardest to Easiest**
 - [7] **Duration – Shortest to Longest**
 - [8] **Duration – Longest to Shortest**
 - [9] **Custom** [Premium feature]

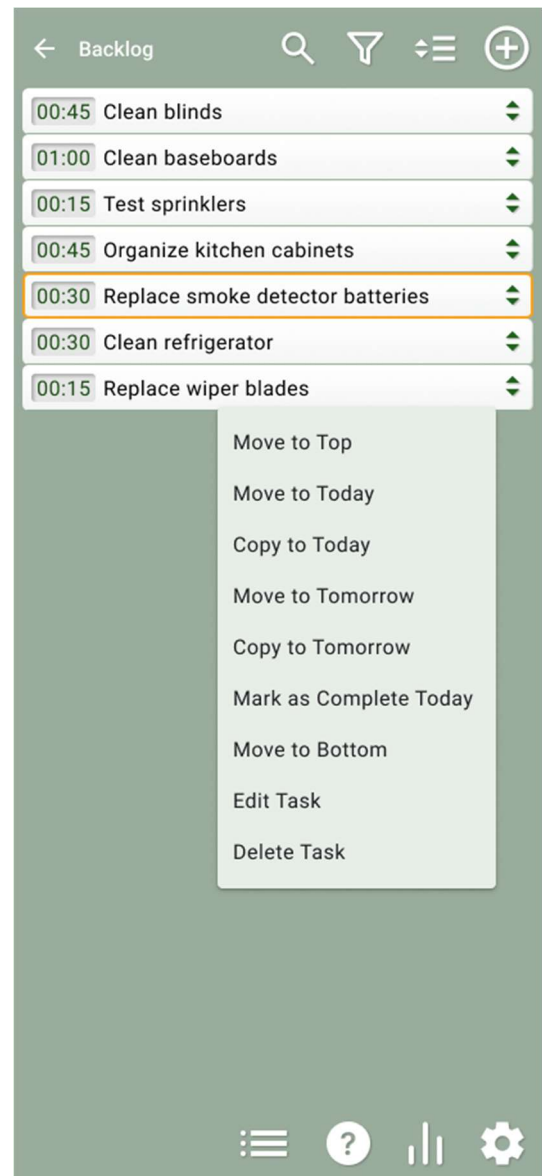


A *sortOrder* field (integer) is stored in the *ListItem* table to support custom ordering in the backlog. When the user selects Custom sort, backlog items are displayed by ascending *ListItem.sortOrder* and arrow icons appear on the right side of each row. This is the only sort that allows manual movement of rows. Dragging an item to a new position updates the *sortOrder* values of all affected records immediately. The last-used sort mode is stored in *Settings.backlogSortMode* and restored on next launch. Selecting any sort option other than Custom displays items in the chosen order without modifying the stored *sortOrder* values, so the custom arrangement is preserved for later use.

- When a new item is added to the backlog, the *sortOrder* field will be populated with 0 so it will appear in the first position, causing that field to update for all following items.

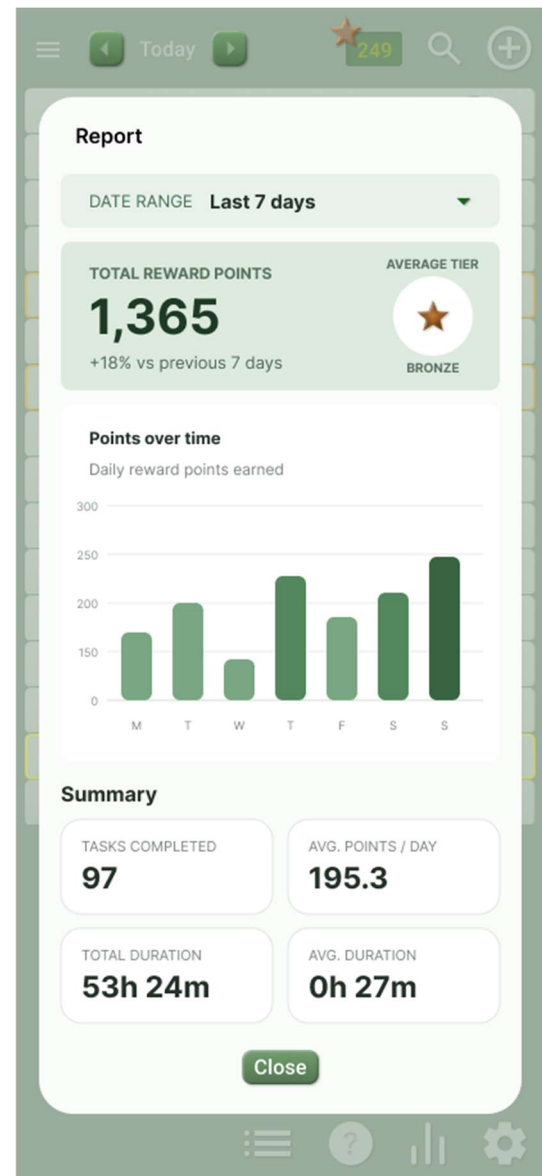
Backlog – Long-Press Task

- The menu includes the following selections:
 - **Move to Top** is visible only when using Custom sort. This updates *ListItem.sortOrder* to 0 and updates that field for all following items. The row remains in the backlog.
 - **Move to Today** updates *ListItem.listDate* with today's date.
 - **Copy to Today** duplicates the *ListItem* record and updates *ListItem.listDate* with today's date. The original record (with a null or blank listDate) remains.
 - **Move to Tomorrow** updates *ListItem.listDate* with tomorrow's date.
 - **Copy to Tomorrow** duplicates the *ListItem* record and updates *ListItem.listDate* with tomorrow's date. The original record (with a null or blank listDate) remains.
 - **Mark as Complete Today** updates *ListItem.listDate* and *ListItem.dateCompleted* with today's date.
 - **Move to Bottom** is visible only when using Custom sort. This updates *ListItem.sortOrder* to the number that follows the last item in the list. The row remains in the backlog.
 - **Edit Task** opens the Edit Task screen [same functionality as short-press on task].
 - **Delete Task or Delete Appointment**
 - The row will be deleted, and then a snackbar will appear at the bottom of the screen for 5 seconds: "Task [or Appointment] deleted" with an **Undo** link.



Reporting

- **Date Range** is a dropdown menu with the following selections:
 - **Today**
 - **Last 7 days** [default]
 - **Last 30 days** [Premium feature]
 - **Last 60 days** [Premium feature]
 - **Last 90 days** [Premium feature]
 - **Custom** [Premium feature]
- **Total Reward Points** sums the *ListItem.rewardPoints* for the selected date range. Below the total is the calculated change (as a percentage) over the previous period.
- **Average Tier** uses the total reward points in the date range divided by the number of days in the date range, with this average being applied to the reward point tiers entered in the Settings screen.
- **Points over time** displays a bar chart with reward points by day.
- **Summary**
 - **Tasks Completed** is the total number of tasks with a populated *ListItem.dateCompleted* field for the selected date range.
 - **Avg. Points / Day** is the sum of *rewardPoints* for completed tasks in the selected date range divided by the number of days in the date range.
 - **Total Duration** is the sum of the *elapsedDuration* field for all completed tasks in the selected date range. Display this in the format [X]h [Y]m.
 - **Avg. Duration** is the sum of the *elapsedDuration* field for all completed tasks in the selected date range divided by the number of days in the date range. Display this in the format [X]h [Y]m.



Settings

- **List Mode**
 - **Scheduled** [Default] the main task list will show the scheduled time for all tasks.
 - **Timed** – the main task list incorporates a stopwatch timer for each row, enabling the user to time each task.
- * **Dark Mode** is off by default.
- **Display Notes in Task List**
- **Expand Subtasks** determines the initial display of subtasks in the main task list, which can then be toggled open or closed.
- **Swipe to Delete** – enables this feature in the main list and backlog. An undo snackbar will appear at the bottom of the screen for 5 seconds after swiping.
- **Default Time** [for New Tasks; default to *Latest*]
 - **Earliest** - time will be one increment earlier than the earliest scheduled task for the day
 - **Latest** - time will be one increment following the duration of the last scheduled task for the day
- **Default Duration** [for New Tasks; default to 30:00]
- **Time Increment**
 - Opens a dialog allowing the selection of 5, 10, or 15 minutes.
 - Defaults to 15 minutes.
- **Start of Schedule**
- **Day Boundary**
- **Rewards**
 - Default values, all are editable:
 - Platinum [300]
 - Gold [250]
 - Silver [200]
 - Bronze [150]
 - Validation on **Save**:
 - Maximum value of 500 in any one field.
 - Entries must be unique and in descending order, with a minimum value of 4, 3, 2, and 1 in the four fields.
 - Tapping the **Reset** button returns values to default settings.
 - Saved as four separate int keys (*rewardPlatinum*, *rewardGold*, and so on) in DataStore.
- **Weekend** - choose day(s) considered off work or school.
 - Radio buttons with days of week.
 - *Saturday* and *Sunday* are selected by default.
- **Google Calendar** [Premium feature]
 - **Sync Appointments to Calendar** [default to On]
 - **Sync Scheduled Tasks to Calendar** [default to Off]
- Tapping any **?** button opens a popup with the associated context-sensitive help topic (page 18).

* Dark mode is implemented using Material 3's built-in light and dark theme variants, generated from the app's seed color. No per-component color overrides are required. A future enhancement will allow users to select a custom seed color, which will regenerate the full color palette automatically without changes to individual UI components.

Premium Features

Free	Premium
Single color scheme plus dark mode	Custom color seed
Reporting with chart for today or the last 7 days	Additional selections for 30, 60, 90, and custom range
Main list and backlog limited to 100 rows each	Unlimited rows in main list and backlog
Backlog sort by date, priority, difficulty, duration	Backlog custom sort
N/A	Import / Export lists by date range
N/A	Google Calendar integration for appointments

Notifications

ThymeBoxer uses WorkManager to schedule task reminders reliably, including when the app is closed or the device has been restarted.

Scheduling

When a task or appointment is saved with notifications enabled, a WorkManager OneTimeWorkRequest is scheduled for the notification time (the task's *startTime* minus the user-specified lead time as stored in the *ListItem.notificationTiming* field, which defaults to 10 minutes). If the task is edited or deleted, any existing WorkRequest for that item is cancelled by tag (using the *ListItem.id* as the tag) and rescheduled if applicable.

Notification Content

Each notification displays:

- Title: The task or appointment description
- Body: "Starting in [lead time] minutes" or "Starting now" if lead time is set to 0
- Action button: "Mark Complete" — tapping this marks the task complete without opening the app

Permissions

On Android 13 (API 33) and above, the app must request the POST_NOTIFICATIONS permission at first launch. If permission is denied, the Notification toggle in the New Task / Edit Task screen should be disabled with an explanatory note.

Edge Cases

- If a task's scheduled time has already passed when the app launches (e.g., after a device restart), the notification is not sent retroactively
- Notifications are not generated for backlog items, since they have no scheduled date or time
- If a recurring task is regenerated at startup, its notification is scheduled at that time using the template's defaultTime and the user's default lead time

Startup

Upon each app launch, perform the following steps in order:

Step 1 – Initialize Today's Recurring Tasks

Query the *RecurringTemplate* table for all templates whose *recurring* field includes the current day of the week. For each matching template, check whether a *ListItem* record already exists for today with a matching *recurringTemplateId*. If no such record exists, create a new *ListItem* record populated from the template's fields (*description*, *notes*, *defaultDuration*, *defaultTime*, *difficulty*, *priority*, *pinned*), with *listDate* set to today and *rewardPoints* calculated from *difficulty* and *duration*.

If the app has not been launched on one or more previous days, do not back-fill recurring tasks for those missed days. Only today's recurring tasks are generated.

Step 2 – Load Today's Task List

Populate the main task list with all *ListItem* records where *listDate* equals today, plus any records where *dueDate* equals today (tasks and appointments). Sort by *startTime* ascending, with unscheduled Timed mode tasks appearing at the bottom.

Step 3 – Conflict Check

Check all of today's tasks and appointments for *startTime* / *duration* overlaps among pinned tasks and appointments. If any conflicts are found, display a non-blocking banner or badge indicator rather than an intrusive popup, since the user may not intend to resolve them immediately.

Step 4 – Calculate Today's Reward Points

Sum the *rewardPoints* field for all *ListItem* records where *dateCompleted* equals today. Display this total in the upper right of the main screen and apply the appropriate reward tier icon (Bronze / Silver / Gold / Platinum) based on the thresholds defined in *Settings.rewards*.

Step 5 – Apply Display Preferences

Apply the *Settings.expandSubtasks* setting (expand or collapse subtask rows), *displayNotes* setting, and *darkMode* setting.

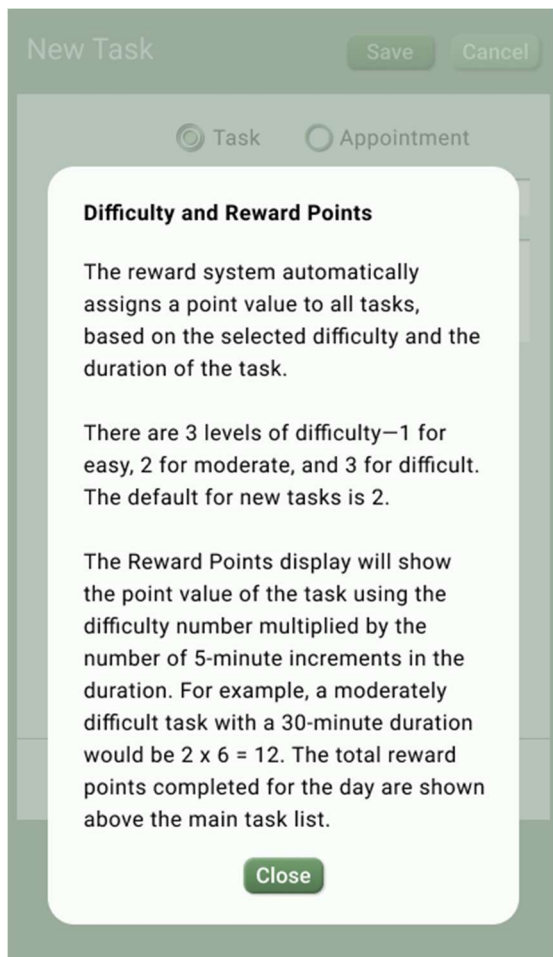
Context-Sensitive Help Popups

Screen	Label	Content
New Task / Edit Task	Difficulty / Reward Points	Difficulty and Reward Points The reward system automatically assigns a point value to all tasks, based on the selected difficulty and the duration of the task. There are 3 levels of difficulty—1 for easy, 2 for moderate, and 3 for difficult. The default for new tasks is 2. The Reward Points display will show the point value of the task using the difficulty number multiplied by the number of 5-minute increments in the duration. For example, a moderately difficult task with a 30-minute duration would be $2 \times 6 = 12$. The total reward points completed for the day are shown above the main task list.
	Pin to Top	Pin to Top Whether you are using Scheduled tasks or Timed tasks, checking this box will cause the task or appointment to appear in the top “Pinned Tasks” section of the main task list.
	Sync Task / Appointment to Google Calendar	Sync to Google Calendar Checking this box will cause the task or appointment to be copied to your Google Calendar account, and it will default to the Sync Appointments to Calendar and Sync Scheduled Tasks to Calendar settings. This feature is only available in the Premium version.
Settings	List Mode	List Mode There are two ways of using the task list—Scheduled and Timed: In Scheduled mode, each task requires a specific time. If you don’t enter a time for new tasks, that field will be populated automatically based on the Start of Schedule and Default Time settings. The main task list will show the scheduled time for all tasks. In Timed mode, scheduling is only used for appointments, and the main task list will include a stopwatch-style timer for each row—enabling you to time each task.
	Expand Subtasks	Expand Subtasks If this setting is activated, any subtasks associated with tasks and appointments in the main task list will be automatically expanded for viewing upon opening the app. They can then be closed and opened as needed. If this setting is not activated, subtasks will be closed on startup.

	Swipe to Delete	Swipe to Delete When activated, this setting allows swiping on a row to delete a task or appointment. A message will appear briefly at the bottom of the screen allowing you to undo the delete.
	Default Time	Default Time This entry determines the initial value of the Time field when adding new tasks or appointments, which can then be edited if needed. Selecting Earliest will set the time to follow the last completed task in the list. The scheduled time of any tasks that follow the new task will be adjusted. Selecting Latest will set the time to follow the last scheduled task for the day, taking that task's duration into consideration.
	Default Duration	Default Duration This entry determines the initial value of the Duration field when adding new tasks or appointments, which can then be edited if needed.
	Time Increment	Time Increment This selection determines the number of minutes that the Duration arrow buttons increment or decrement in the New / Edit Task screen.
	Start of Schedule	Start of Schedule The earliest that a new scheduled task or appointment may be added in the main list. If the list is empty, the first task added will default to this time.
	Day Boundary	Day Boundary This is the time when one date changes to the next. While it is typically 12:00 am, the option exists for those whose day ends after midnight.
	Rewards	Rewards Depending on your level of mobility and other factors affecting productivity, a typical daily score for <i>you</i> might be significantly more or less than someone else's. These fields allow you to customize the number of points that are appropriate for your abilities and personal goals. Needless to say, Platinum should be tough to achieve. A maximum value of 500 is allowed in any one field, and all entries must be unique and in descending order. Tap the Reset button to return to the default values.
	Weekend	Weekend Select the days which you consider to be your "weekend" days—in other words, the days you are off work or school. This simplifies adding recurring tasks. For example, if you add a new recurring task and select "Weekend," the

		corresponding day boxes will be automatically checked based on this setting. Similarly, adding a new recurring task and selecting “Work/School Days” will automatically check the boxes that are <i>not</i> marked as weekend days in this screen.
	Sync Appointments to Calendar	Sync Appointments to Google Calendar This setting determines the initial value of the Sync Appointment to Google Calendar field when adding new appointments, which can then be changed for each new appointment if needed. This feature is only available in the Premium version.
	Sync Scheduled Tasks to Calendar	Sync Scheduled Tasks to Google Calendar This setting determines the initial value of the Sync Task to Google Calendar field when adding new tasks, which can then be changed for each new task if needed. Note that tasks in Timed mode do not have a scheduled time, and so cannot be synced. This feature is only available in the Premium version.

Example Context-Sensitive Help Popup



Additional Technical Information

This section has been updated to reflect current Android development best practices as of early 2025. The project uses Kotlin with Jetpack Compose for a modern, declarative UI approach.

Architecture and Platform

Item	Detail
Language	Kotlin
UI Framework	Jetpack Compose (declarative UI)
Architecture Pattern	MVVM (Model-View-ViewModel)
Minimum SDK	API 26 (Android 8.0 Oreo)
Target SDK	API 35 (Android 15)
Build System	Gradle with Kotlin DSL (build.gradle.kts)
Authentication	None required

Note: The minimum SDK has been raised from API 23 to API 26. This still covers approximately 97% of active Android devices and allows access to modern date/time APIs (`java.time`) without the need for desugaring workarounds.

Libraries and Dependencies

Core Jetpack Libraries

Library	Purpose
Room	Local SQLite database with Kotlin coroutines support. Handles the <i>ListItem</i> , <i>SubTaskItem</i> , <i>RecurringTemplate</i> , and <i>RecurringSubTaskTemplate</i> tables.
ViewModel	Manages UI-related data in a lifecycle-aware way. Survives configuration changes (e.g., screen rotation).
Navigation Compose	Handles screen transitions within Compose. Replaces the older fragment-based Navigation Component.
DataStore	Modern replacement for SharedPreferences. Stores user preferences with type safety.
WorkManager	Schedules recurring task notifications reliably, even if the app is closed.

UI and Compose Libraries

Library	Purpose
Material 3 (Material You)	Google's latest design system for Compose. Provides themed components, color schemes, and dynamic theming for dark mode.
Compose Foundation	Core building blocks including lazy lists (replaces RecyclerView), gestures, drag-and-drop, and swipe-to-dismiss.
Compose Animation	Built-in animation APIs for the confetti reward animation and screen transitions.

Other Libraries

Library	Purpose
Kotlinx Serialization	JSON serialization for database export/import and backup files.
Timber	Lightweight logging utility for development and debugging.
Hilt	Dependency injection framework recommended by Google for Android. Simplifies wiring ViewModels, repositories, and database instances.

Key Changes from Original Technical Spec

The following items from the original specification have been updated or replaced:

Original	Updated To	Reason
XML Layouts + ConstraintLayout	Jetpack Compose	Declarative UI is now the standard; easier to generate and maintain with AI assistance.
RecyclerView	LazyColumn (Compose)	Built into Compose; handles task lists, drag-and-drop, and swipe gestures.
Material Design Components	Material 3 (Material You)	Latest version with built-in dynamic theming and dark mode support.
ViewBinding	Removed (not needed)	Compose eliminates the need for view binding entirely.
LiveData	Kotlin StateFlow / Compose State	StateFlow integrates more naturally with Compose and Kotlin coroutines.
API 23 minimum	API 26 minimum	Enables native java.time support and covers 97%+ of devices.
API 34 target	API 35 target	Updated to current Android 15.
(not specified)	Hilt (dependency injection)	Recommended by Google; reduces boilerplate when wiring app components.

Data Storage and Backup

Data Storage

- **Room database** for structured data (*ListItem*, *SubTaskItem*, *RecurringTemplate*, and *RecurringSubTaskTemplate* tables)
- **DataStore** for app preferences (*Settings* table and any main menu toggles)

Backup Strategy

- Implement automatic database export to a JSON file in the app's private directory
- Keep completed tasks for at least 120 days by default

Possible Historical Data Enhancements

- Optionally integrate with Android's Auto Backup feature
- Add a setting allowing users to customize retention period (30/60/90 days or forever)
- Archive older data instead of deleting it outright
- Add a "compact database" option that permanently removes old data for users with storage constraints
- Add a manual "Export/Import" feature in Settings for user-controlled backups

Recommended Project Structure

The following package structure follows standard MVVM conventions for a Compose-based Android project:

com.thymebaxter/ *Root package*

data/ *Data layer*

database/ *Room database, DAOs, entities*

repository/ *Repository classes (bridge between data and UI)*

ui/ *UI layer*

screens/ *Compose screens (Main, EditTask, Settings)*

components/ *Reusable Compose components (TaskRow, SubtaskList)*

theme/ *Colors, typography, dark/light theme definitions*

viewmodel/ *ViewModels for each screen*

di/ *Hilt dependency injection modules*

util/ *Utility classes (date formatting, reward calculations)*

Recommended Build Sequence

Phase	Component	Description
1	Project Setup	Create the Android Studio project with Kotlin, Compose, and all dependencies configured in build.gradle.kts.
2	Database Layer	Room entities, DAOs, and database class for Settings, ListItem, and SubTaskItem. Repository classes.
3	Theme and Navigation	Define the color scheme (green/white), dark mode theme, typography, and Compose navigation graph.
4	Settings Screen	Full Settings UI with all toggles, reward configuration, and weekend selection. Validates save logic.
5	New Task / Edit Task	Task creation and editing form including subtasks, recurring task dialog, priority, and difficulty.
6	Main Screen (Scheduled)	Task list with time slots, drag-to-reorder, completion checkboxes, reward points display, and date navigation.
7	Main Screen (Timed)	Stopwatch timer functionality layered onto the main screen.
8	Backlog	Task list with duration display, drag-to-reorder; search, filter, sort, and add functions.
9	Context Menus and Help	Long-press context menu, context-sensitive help popups, and the Continue Tomorrow flow.
10	Rewards and Reports	Confetti animation, reward tier icons, and the reward points chart screen.
11	Polish and Testing	Edge cases, validation messages, swipe-to-delete, and overall UX refinement.