## Requirements

**Group Name:** Group 11 **Group Number:** 11 **Group Members:** 

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Our approach to requirements elicitation consisted of three stages:

- Preliminary list prior to the stakeholders interview, we brainstormed as a team and came up with a
  preliminary list of requirements containing most user requirements we could extract from the
  product brief alone and included any FR and NFR we could think of. These were, of course, rather
  general and in need of refining, but they helped us come up with questions for our interview with the
  stakeholders.
- Stakeholder interview At the stakeholders meeting we presented our initial ideas, seeking feedback and missed requirements. Prior to that, We came up with features which we thought would improve the gameplay which were not included in the product brief, such as allowing the player to complete minigames at each activity to boost their score, obstacles, NPC's and gaining energy. However, we were advised to keep it simple and focus on having a functioning game. Hence, we removed some of our unnecessary requirements. The stakeholders told us that the audience they had in mind were 16-20 year olds, the objective is to give them a glimpse into the daily life of a university student in a fun and interactive way. This tells us that the game needs to be catchy, appealing and family friendly. We also want the game to resemble a popular game which is similar. The stakeholder said that the game could take inspiration from popular 2D platformers such as Stardew Valley and Pokemon. We also asked the stakeholder about including a feature to allow users to choose time to spend on activity, we were told only for things that make sense, hence studying. We asked what activity interaction should feature, we were told only to interact and done for now.
- Requirements refining following this valuable meeting with the stakeholders, our team was ready to refine our requirements into a more detailed and complete list. We removed all unnecessary features, added any we missed and improved the detail of any vague requirements. We grouped the preliminary listed requirements into user, functional, non-functional and constraint requirements and dug deeper to list down all FR and NFR's. We did this by holding each user requirement one-by-one and researching and brainstorming FR's for each one. then presented everything in a requirements table, recording priorities, fit criterias and relating functional requirements to the user and stakeholders needs. The structured presentation of requirements, including use cases, system operations, class diagrams, attributes, and gameplay rules demonstrates a deep understanding of the game's design needs. Research into industry standards such as UML methodologies, UX design principles, recording requirements ensured that the requirements captured essential features, behaviours, and constraints for successful game development, enhancing player experience and game performance.

## **USER REQUIREMENTS TABLE**

ID.	<u>Description</u>	<u>Priority</u>	
UR_SEAMLESS_START	User can start game effortlessly	SHALL	
UR_GUIDANCE	User receives step-by-step guidance throughout game	SHOULD	
UR_MOVEMENT	The user can move around the map	SHOULD	
UR_INTERACTION	User can interact with map elements	SHOULD	
UR_RESOURCES	Users track/manage time/energy strategically	SHOULD	
UR_DAY_COUNT	User experiences and tracks 7 in game days	SHOULD	
UR_OBJECTIVES	The user shall have clear objectives with studying being compulsory, and be able to keep track of completed ones.	SHALL	
UR_WINNING_CRITERIA	The user wins the game by completing studying objectives daily, while maintaining a healthy lifestyle.	SHOULD	
UR_GAME_DURATION	The user should complete game in 5-15 mins.	SHALL	
UR_REALISTIC_EXCITING_EXPERIEN CE	Users enjoy a realistic and engaging simulation ensuring a catchy start and ending.	SHALL	
UR_GAME_OPTIONS	User can pause, restart or exit game.	SHOULD	
UR_SATISFACTION	Users experience a smooth and pleasant game.	SHALL	
UR_COMPATIBLE_W_EVERYONE	Game is playable by various user types	SHALL	

## FR REQUIREMENTS TABLE

ID	<u>Description</u>	<u>User requirement(s)</u>		
Invariant				
FR_START_PAGE	Start page with game options.	UR_SEAMLESS_START		
FR_NEW_GAME	Option to start new game from day 1	UR_SEAMLESS_START		
FR_MOVEMENT_CONTROLS	Controls for avatar movement	UR_MOVEMENT		
FR_MAP	Map of uni campus + city for exploring	UR_MOVEMENT + UR_INTERACTION		
FR_INTERACTION_CONTROLS	Controls for map interactions	UR_INTERACTION		
FR_CLOCK	Display in-game time	UR_RESOURCES		
FR_ENERGY_BAR	Display energy levels	UR_RESOURCES		
FR_TIME	In game time passage rules	UR_RESOURCES + UR_GAME_DURATION		
FR_GRADE_TRACKER	Track studying and lifestyle performance and increase score	UR_OBJECTIVES		

FR_PASSING_GRADE Wiming conditions based on score UP_OBJECTIVES  FR_PAUSE Game pause feature UP_CAME_OPTIONS  FR_DAY_NUMBER Display current in-game day UP_DAY_COUNT  FR_RESTART Option to restart game UP_CAME_OPTIONS  FR_RESTART Simulate realists time changes UP_REALISTIC_EXCITING_EXPERIENCE  FR_OBJECTIVES_SHOWCASING Display + track objectives, ensure its made clear studying is computatory  FR_SKIP_A_DAY Option to skip studying for a day UP_REALISTIC_EXCITING_EXPERIENCE  FR_SKIP_A_DAY Option to skip studying for a day UP_REALISTIC_EXCITING_EXPERIENCE  FR_SCANTING_PAGE Loading storens between stages UP_REALISTIC_EXCITING_EXPERIENCE  FR_STARTING_PAGE Size of pains start page with clear Options  FR_END_PAGE Display and game info UP_REALISTIC_EXCITING_EXPERIENCE  FR_POP_UPS In-game instructional pop ups UP_REALISTIC_EXCITING_EXPERIENCE  FR_NEW_GAME Start new game from day 1 with 0 OptionaNCE  FR_NEW_GAME Start new game from day 1 with 0 OptionaNCE  FR_STUDY Interaction with accommodation at the commodation of the commodation optional options of stady from start new day at 7 am  FR_WORK_OUT Interaction with sports village, work out UP_WINNING_CRITERIA UP_REALISTIC_EXCITING_EXPERIENCE  FR_RECREATIONAL_ACCTIVITY_ Interaction with theme park, user gets UP_REALISTIC_EXCITING_EXPERIENCE UP_WINNING_CRITERIA UP_REALISTIC_EXCITING_EXPERIENCE UP_WINNING_CRITERIA UP_WINNING_CRITE			<u> </u>	
FR_DAY_NUMBER  Display current in-game day  UR_DAY_COUNT  FR_RESTART  Option to restart game  UR_GAME_OPTIONS  UR_REALISTIC_EXCITING_EXPERIENCE  FR_DAYLIGHT  Simulate realistic time changes  UR_REALISTIC_EXCITING_EXPERIENCE  UR_OBJECTIVES  FR_SKIP_A_DAY  Option to skip studying for a day  UR_REALISTIC_EXCITING_EXPERIENCE  UR_SEAMLESS_START  FR_SKIP_A_DAY  Option to skip studying for a day  UR_REALISTIC_EXCITING_EXPERIENCE  FR_LOADING_PAGE  Loading screens between stages  UR_SEAMLESS_START  UR_SEAMLESS_START  FR_STARTING_PAGE  Eye catching start page with clear options  FR_END_PAGE  Display end game info  UR_SEAMLESS_START + UR_REALISTIC_EXCITING EXPERIENCE  FR_POP_UPS  In-game instructional pop ups  UR_SEAMLESS_START + UR_REALISTIC_EXCITING EXPERIENCE  FR_NEW_GAME  Start new game from day 1 with 0  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  SOTIO  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_SEAMLESS_START  UR_PAY_COUNT + UR_WINNING CRITERIA Extra starts new day at 7 am  "H_UR_PAY_COUNT + UR_WINNING CRITERIA HERECISION with GS and piazza prompts choices for study hours.  FR_WORK_OUT  Interaction with GS and piazza prompts choices for study hours.  UR_WINNING_CRITERIA  "H_UR_REALISTIC_EXCITING_EXPERIENCE"  UR_WINNING_CRITERIA  UR_R	FR_PASSING_GRADE	Winning conditions based on score UR_OBJECTIVES		
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FR_OBJECTIVES_SHOWCASING    Display + track objectives, ensure its made clear studying is compulsory	FR_RESTART	Option to restart game	UR_GAME_OPTIONS	
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FR_NEW_GAME  Start new game from day 1 with 0 score  FR_SLEEP  Interaction with accommodation starts new day 17 am  Interaction with accommodation starts new day 17 am  Interaction with CS and piazza prompts choices for study hours.  FR_STUDY  Interaction with CS and piazza prompts choices for study hours.  FR_WORK_OUT  Interaction w/ sports village, work out  IR_WINNING_CRITERIA  IR_REALISTIC_EXCITING_EXPERIENCE  FR_RECREATIONAL_ACCTIVITY_  Interaction w/ lake feeds ducks  UR_REALISTIC_EXCITING_EXPERIENCE + UR_WINNING_CRITERIA + UR_WINNING_CRI	FR_END_PAGE	Display end game info		
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prompts choices for study hours .  FR_WORK_OUT  Interaction w/ sports village, work out UR_WINNING_CRITERIA + UR_REALISTIC_EXCITING_EXPERIENCE  FR_RECREATIONAL_ACCTIVITY_ 1 Interaction w/ lake feeds ducks UR_REALISTIC_EXCITING_EXPERIENCE + UR_WINNING_CRITERIA  FR_RECREATIONAL_ACTIVITY_2 Interaction w/ theme park, user gets on a ride UR_REALISTIC_EXCITING_EXPERIENCE + UR_WINNING_CRITERIA  FR_EAT  Interaction w/ piazza prompts UR_REALISTIC_EXCITING_EXPERIENCE + UR_WINNING_CRITERIA  FR_EAT  Interaction w/ piazza prompts UR_RESOURCES + UR_GAME_DURATION  FR_STUDY_TIME  Study hours pass based on user input  Work out = 2 hours  UR_RESOURCES + UR_GAME_DURATION  FR_RECR_ACTIVITY_1_TIME  Feeding duck = 1 hour  UR_RESOURCES + UR_GAME_DURATION  FR_RECR_ACTIVITY_2_TIME  Ride = 1 hour  UR_RESOURCES + UR_GAME_DURATION  FR_EATING_TIME  Eating = 30 mins  UR_RESOURCES + UR_GAME_DURATION  FR_WORK_OUT_ENERGY  Work out = -2 energy  UR_RESOURCES  FR_ACTIVITY_1_ENERGY  Feeding duck = -1 energy  UR_RESOURCES  FR_SLEEP_ENERGY  Sleeping refills energy, late sleep reduces next day energy  UR_RESOURCES  FR_STUDY_POINTS  1 hour study = 5 points  UR_WINNING_CRITERIA  UR_WINNING_CRITERIA  UR_WINNING_CRITERIA	FR_SLEEP		UR_DAY_COUNT + UR_WINNING CRITERIA + UR_REALISTIC_EXCITING_EXPERIENCE	
FR_RECREATIONAL_ACCTIVITY_ 1 Interaction w/ lake feeds ducks	FR_STUDY		UR_WINNING_CRITERIA	
FR_RECREATIONAL_ACTIVITY_2 Interaction w/ theme park, user gets on a ride  FR_RECREATIONAL_ACTIVITY_2 Interaction w/ theme park, user gets on a ride  FR_EAT  Interaction w/ piazza prompts eat/study  UR_REALISTIC_EXCITING_EXPERIENCE + UR_WINNING_CRITERIA  FR_STUDY_TIME  Study hours pass based on user input  UR_RESOURCES + UR_GAME_DURATION  FR_WORK_OUT_TIME  Work out= 2 hours  UR_RESOURCES + UR_GAME_DURATION  FR_RECR_ACTIVITY_1_TIME  Feeding duck = 1 hour  UR_RESOURCES + UR_GAME_DURATION  FR_RECR_ACTIVITY_2_TIME  Ride = 1 hour  UR_RESOURCES + UR_GAME_DURATION  UR_RESOURCES  UR_RESOURCES  UR_RESOURCES  FR_ACTIVITY_1_ENERGY  Feeding duck = -1 energy  UR_RESOURCES  UR_	FR_WORK_OUT	Interaction w/ sports village, work out		
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FR_SLEEP_ENERGY  Sleeping refills energy, late sleep reduces next day energy  FR_STUDY_POINTS  1 hour study = 5 points  UR_WINNING_CRITERIA  FR_EATING_BONUSES  Eat 3x = 1.5x points for day  UR_WINNING_CRITERIA	FR_WORK_OUT_ENERGY	Work out = -2 energy	UR_RESOURCES	
reduces next day energy  FR_STUDY_POINTS 1 hour study = 5 points UR_WINNING_CRITERIA  FR_EATING_BONUSES Eat 3x = 1.5x points for day UR_WINNING_CRITERIA	FR_ACTIVITY_1_ENERGY	Feeding duck = -1 energy	UR_RESOURCES	
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	FR_STUDY_POINTS	1 hour study = 5 points	UR_WINNING_CRITERIA	
FR_STUDY_BONUSES Study >3 hrs = 2x points UR_WINNING_CRITERIA	FR_EATING_BONUSES	Eat 3x = 1.5x points for day	UR_WINNING_CRITERIA	
<u> </u>	FR_STUDY_BONUSES	Study >3 hrs = 2x points	UR_WINNING_CRITERIA	

FR_OVERSTUDYING	Lose 10 pts/hr after 5 hours study	UR_WINNING_CRITERIA	
FR_WORKOUT_BONUS	Work out = 1.5x points for day	UR_WINNING_CRITERIA	
FR_RECREATIONAL_ACTIVITY_B ONUS	2 activities/day = 1.5x points	UR_WINNING_CRITERIA	
Permissible Transformations			
FR_DEPLETED_ENERGY	Prompt error when interacting with no energy, except eat+sleep	UR_RESOURCES	
FR_DOUBLE_STUDY	Study twice only if skip day option used prior	UR_RESOURCES	
FR_EARLY_SLEEP	No sleep before 11 pm	UR_RESOURCES	
FR_MOVEMENT_RESTRICTIONS	No movement through obstacles	UR_MOVEMENT	
FR_MAP_BOUNDARY	Cannot cross map boundary	UR_MOVEMENT	
FR_COMPULSORY_STUDYING	study daily to sleep, 1 day exception	UR_OBJECTIVES	

## NFR REQUIREMENTS TABLE

ID.	DESCRIPTION	USER REQUIREMENTS	FIT CRITERIA
NFR_SECURITY	Ensure user data and progress security	UR_SATISFACTION	99% of users should not face any data leaks
NFR_QUICK_START	Fast game launch	UR_SEAMLESS_START	<5 sec, 80% of the time
NFR_PRECISE_SCORE_COUN T	Accurate score calculation	UR_OBJECTIVES	< 1% error
NFR_CLEAR_INSTRUCTIONS	Clear game instructions, playable without training	UR_GUIDANCE +UR_COMPATIBLE_W_EV ERYONE	Accompanied by manual so 99% of users can confidently play
NFR_DISABILITY_FRIENDLY	Game shall be accessible to players with disabilities.	COMPATIBLE_W_EVERYO	Compatible for 50% of disabled players
NFR_COMPATIBLE_DEVICES	Game shall be accessible through desktop computers.	COMPATIBLE_W_EVERYO NE	90% of people with any computers shall be able to access the game.
NFR_AGE_COMPATIBILITY	Game shall be playable by anyone over the age of 12.	COMPATIBLE_W_EVERYO	99% of people aged 12 or over should be able to operate the game.
NFR_AVAILABILITY	Game shall be accessible most of the time	UR_SATISFACTION	Users should be able to access the game 99% of the time
NFR_PRECISE_TIME	Clock and time passing shall be highly accurate to ensure fairness and consistency	UR_RESOURCES	Time passing by and activity duration shall occur with an error margin of <2%
NFR_RESPONSE_TIME	System shall ensure fast responses to user input	UR_SATISFACTION	Game shall respond to user input with a precision of less than 1 second to ensure an immersive experience
NFR_CHARACTER_ANIMATIO NS	System shall ensure visual continuity for users	UR_SATISFACTION + UR_REALISTIC_EXCITING _EXPERIENCE	Character animations shall transition smoothly between states with a precision of 0.5 seconds
NFR_NPC_REGULARITY	System shall ensure statistically uniform distribution of NPC's.	UR_REALISTIC_EXCITING _EXPERIENCE	NPC's shall be generated with precision such that no more than 3 appear at the same time.
NFR_GRAPHICS	Game shall ensure visually appealing graphics.	UR_REALISTIC_EXCITING _EXPERIENCE	Game shall render graphics with at least 40 FPS