EpicSam: BatteriesNotIncluded2
Project plan - Deliverable 2

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Task breakdown & assignment

Tasks: implement 4 mini simulations that encompass the 4 main topics of the NYA mechanics course: momentum, forces, energy and kinematics.

User story: I want to visually observe the concepts I've learned in the mechanics course and see the effects of momentum, forces energy and kinematics in the real world.

To be implemented:

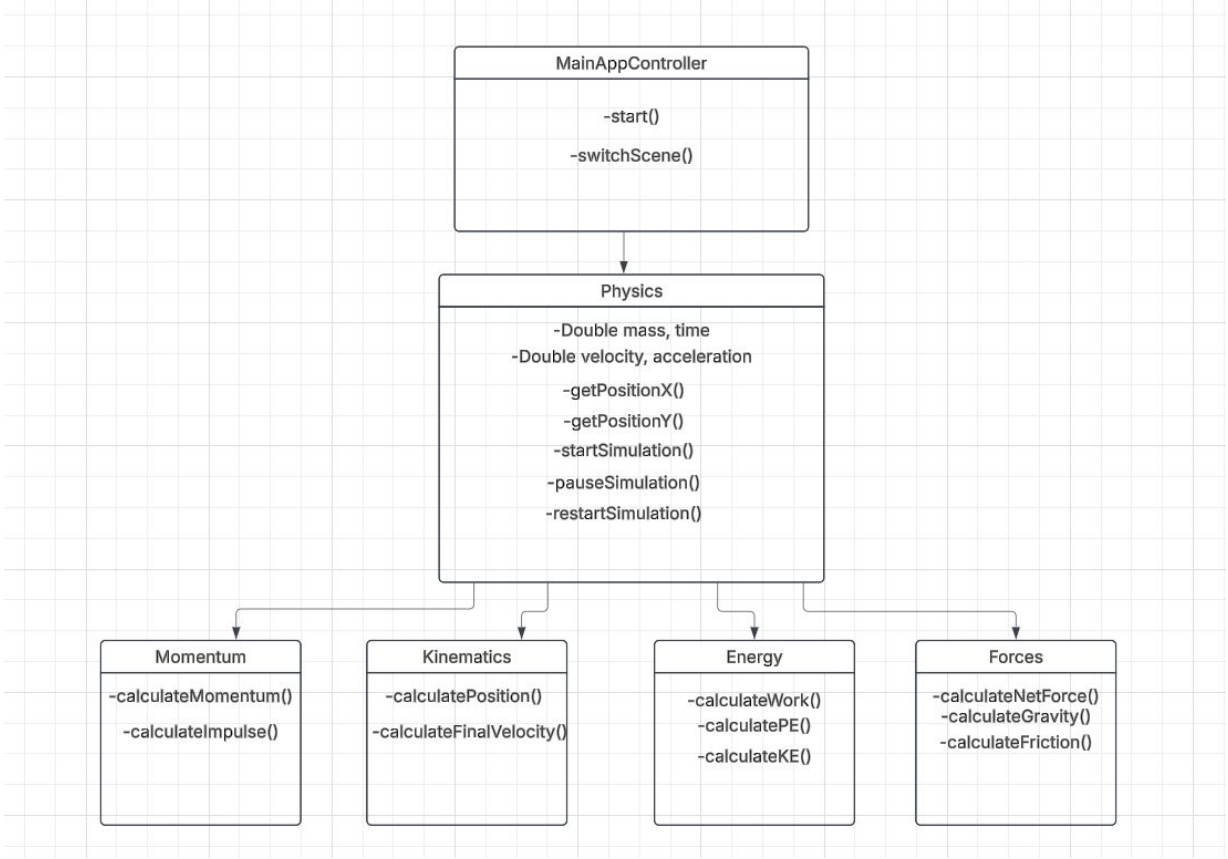
- Momentum: a simulation where the user can control objects that collide into each other and be able to observe the energy transfer. Assigned to Haorui
- Forces: a simulation where the user can apply forces of various magnitudes and directions on an object and see the net force on it. Assigned to Darius
- Projectile motion / kinematics: a simulation where the user can project motion of tiles thrown through the air. Assigned to Kevin.
- Energy: a simulation where the user can interact with a test dummy on a skateboard in order to visualize the energy levels. Assigned to Ilyas.

Task breakdown & assignment

Tasks: implement 4 mini simulations that encompass the 4 main topics of the NYA mechanics course: momentum, forces, energy and kinematics.

	User story	To be implemented	Assigned to	Estimated duration
Momentum	As a physics student, I want to observe how momentum is transferred in collisions, so that I can understand momentum visually.	A simulation where the user can control objects that collide into each other and be able to observe the energy transfer	Haorui	~9 weeks
Kinematics	As a physics student, I want an interactive kinematics simulation, so that I can understand motion concepts such as displacement, velocity, etc visually.	A simulation where the user can control an object into projectile motion or in 1D motion by changing parameters such velocity, acceleration, etc.	Kevin	~9 weeks
Energy	As a physics student, I want an interactive energy simulation, so that I can understand energy concepts such as energy transfers visually.	A simulation where the user can interact with a test dummy on a skateboard, as well as different parameters that have an impact on the energy levels, in order to visualize energy transfers.	Ilyas	~9 weeks
Forces	As a physics student, I want an interactive forces simulation, so that I can understand how different forces affect an object visually.	A simulation where the user can apply various forces to an object and see the results	Darius	~9 weeks

Class diagram



Sample input & output

Momentum:

- Input: user chooses the mass and number of balls, sets their angles, velocities and presses play.
- Output: the balls get launched and collide, transferring momentum, with the energy transfer, positions, change in velocity all displayed to the user.

Forces:

- Input: the user adds a number of force vectors to the diagram and sets their magnitude and direction.
- Output: the net force on the object is displayed as a vector along with a force distribution diagram

Projectile motion / kinematics:

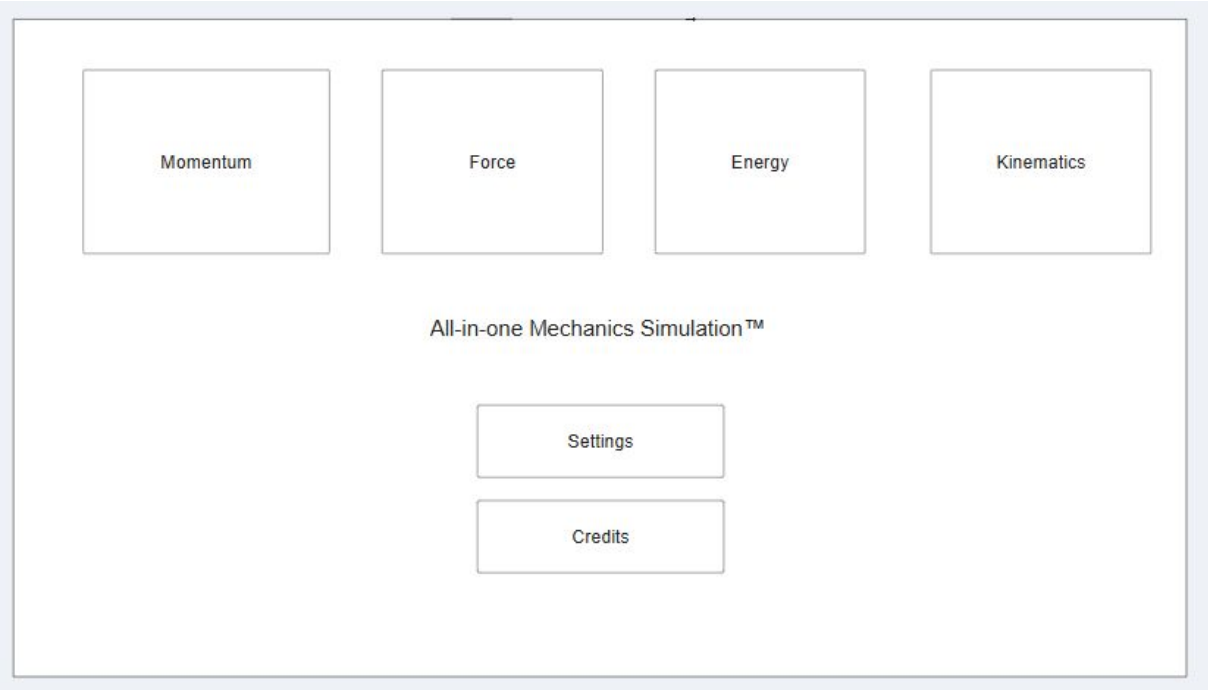
- Input: the user chooses the mass, initial velocity, gravity, and angle of launch of the ball and presses play
- Output: the ball launches through the air and displays the balls trajectory with calculations.

Energy:

- Input: User chooses the friction (0-50 N), gravity (0-20 m/s^2), mass (0-100 kg), and function path (mathematically), in order to observe energy levels and transfers. The user can also choose to display the speed and/or the energy pie chart.
- Output: Skateboard movement, function path (graphically), speed, time, energy transfers.

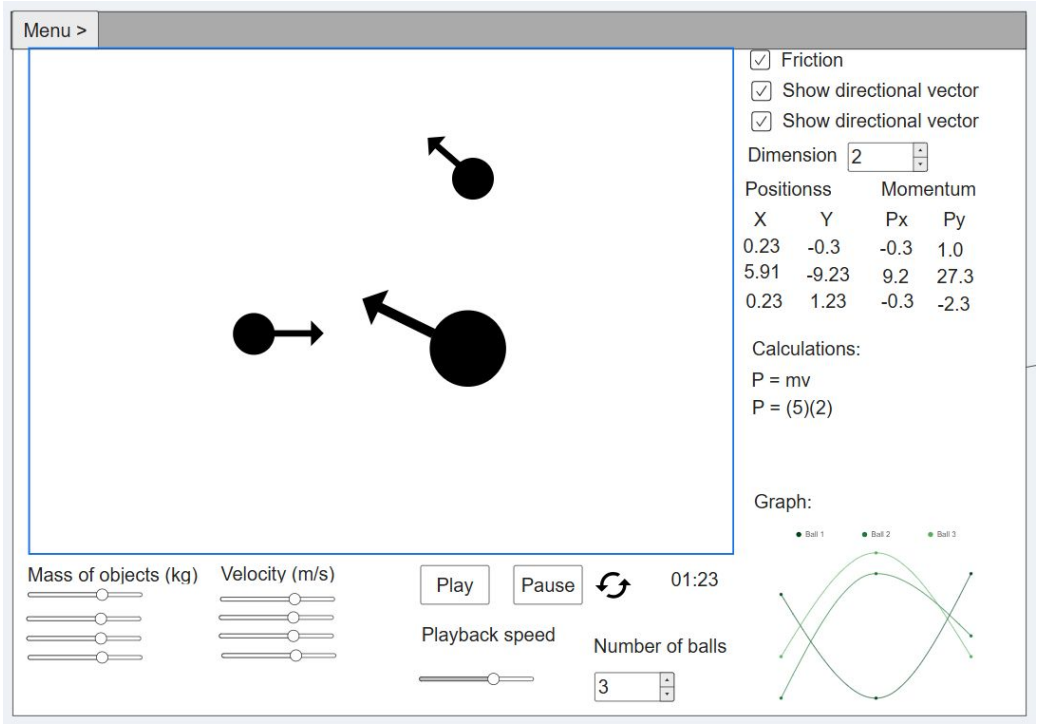
Wireframe

Homescreen



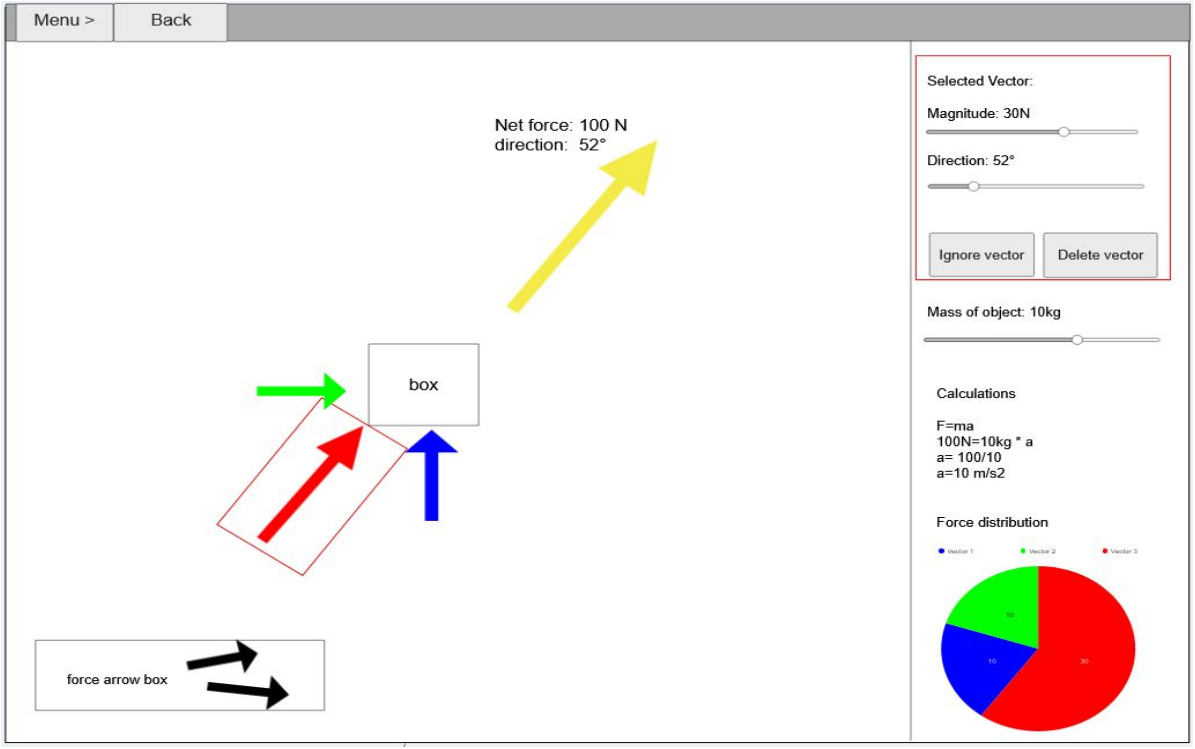
Wireframe (continued)

Momentum simulation



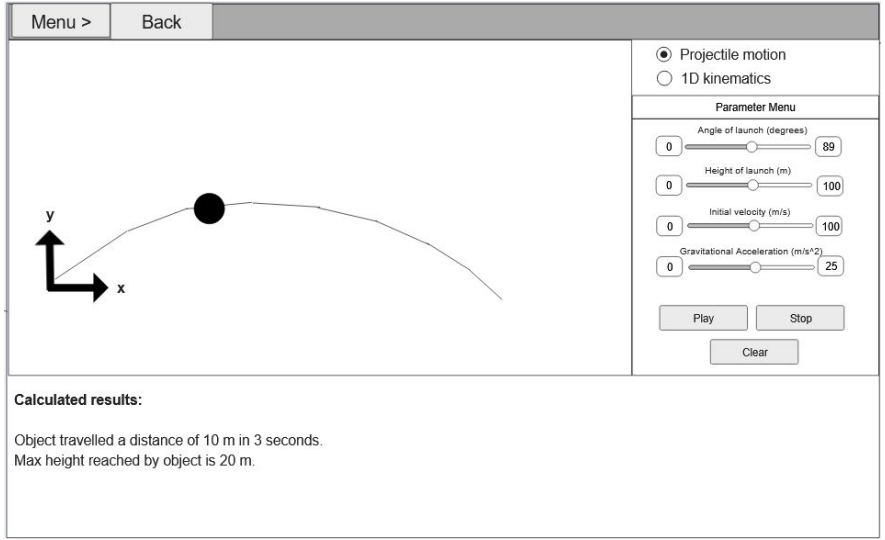
Wireframe (continued)

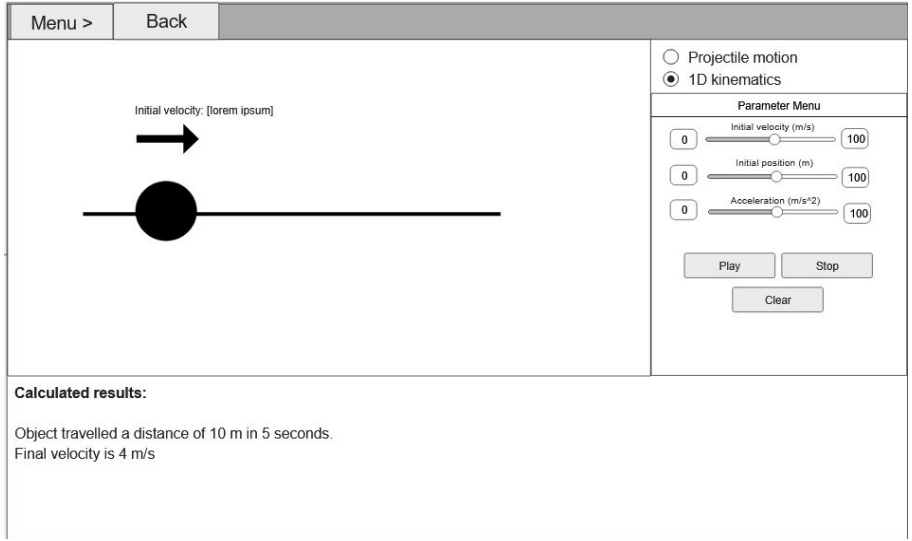
Forces simulation



Wireframe (continued)

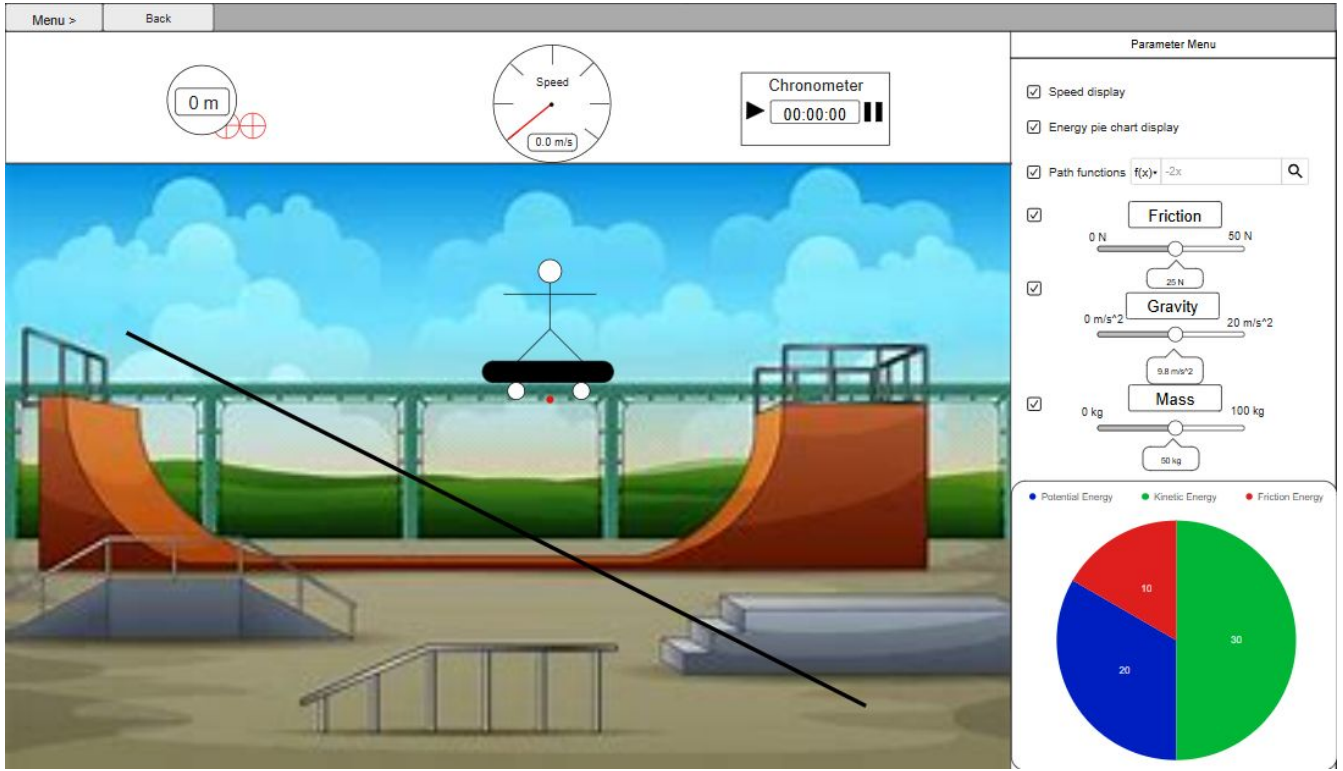
Kinematics





Wireframe (continued)

Energy



Sprint report

Team summary report

Received stories	Resolved stories	Carry over stories	Blocked stories
[W25-8] Decide on what we are doing (1)	[W25-8] Decide on what we are doing (1)		
Total points: 1	Total points: 1	Total points:	Total points:

Sprint report

Haorui

Received stories	Resolved stories	Carry over stories	Blocked stories
[W25-22] Momentum UI (5)	-	-	-
[W25-11] Momentum animation (8)	-	-	-
[W25-34] Momentum logic (8)	-	-	-
Total points: 21	Total points:	Total points:	Total points:

Sprint report

Kevin

Received stories	Resolved stories	Carry over stories	Blocked stories
[W25-21] Projectile UI (5)			
[W25-28] Kinematics UI (5)			
[W25-9] Physics Java class (5)			
Total points: 15	Total points:	Total points:	Total points:

Sprint report

Ilyes

Received stories	Resolved stories	Carry over stories	Blocked stories
[W25-24] Energy UI (5)			
[W25-13] Energy animation (8)			
[W25-36] Energy logic (8)			
Total points: 21	Total points:	Total points:	Total points:

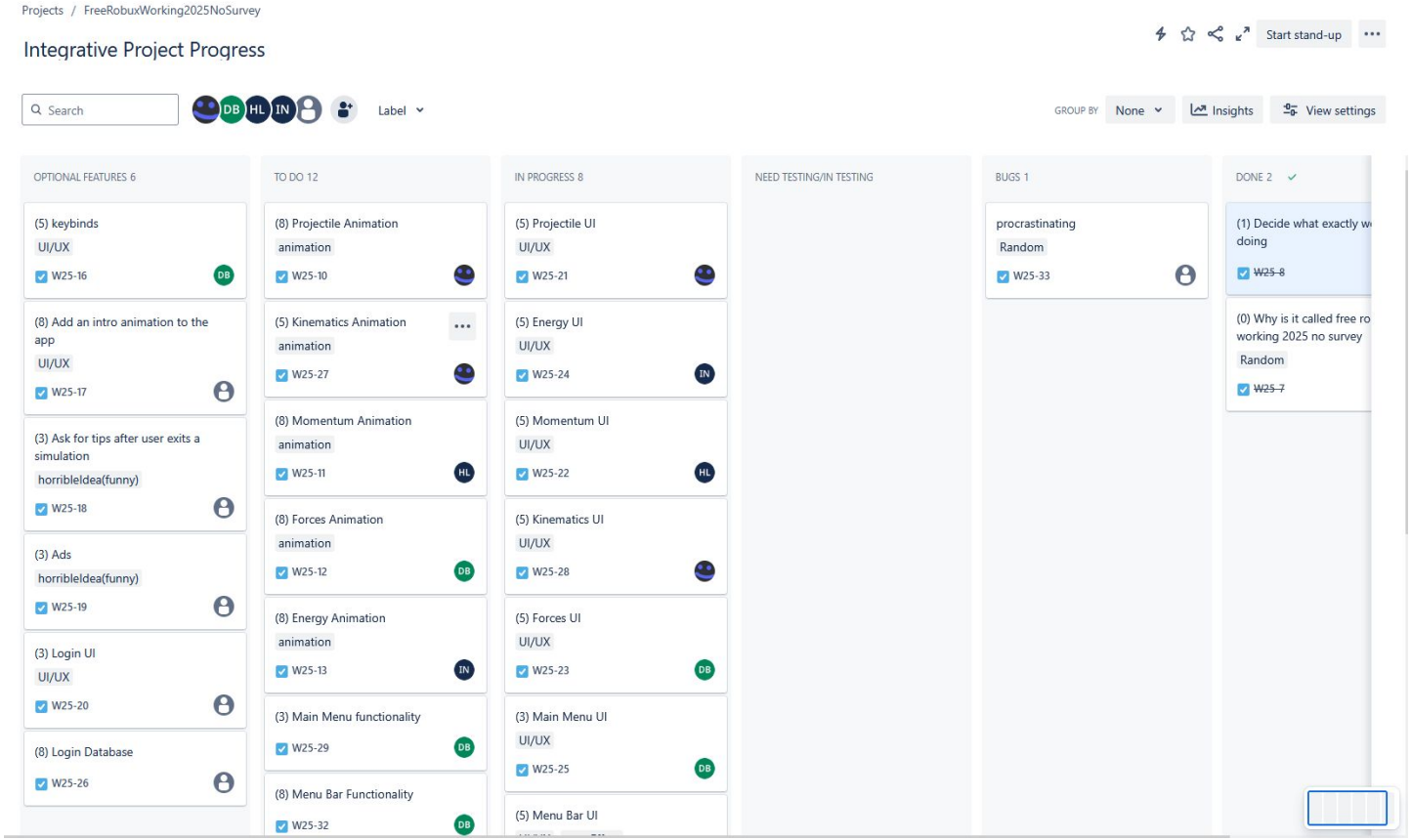
Sprint report

Darius

Received stories	Resolved stories	Carry over stories	Blocked stories
[W25-12] Forces Animation (8)			
[W25-37] Forces logic (8)			
[W25-23] Forces UI (5)			
Total points: 21	Total points:	Total points:	Total points:

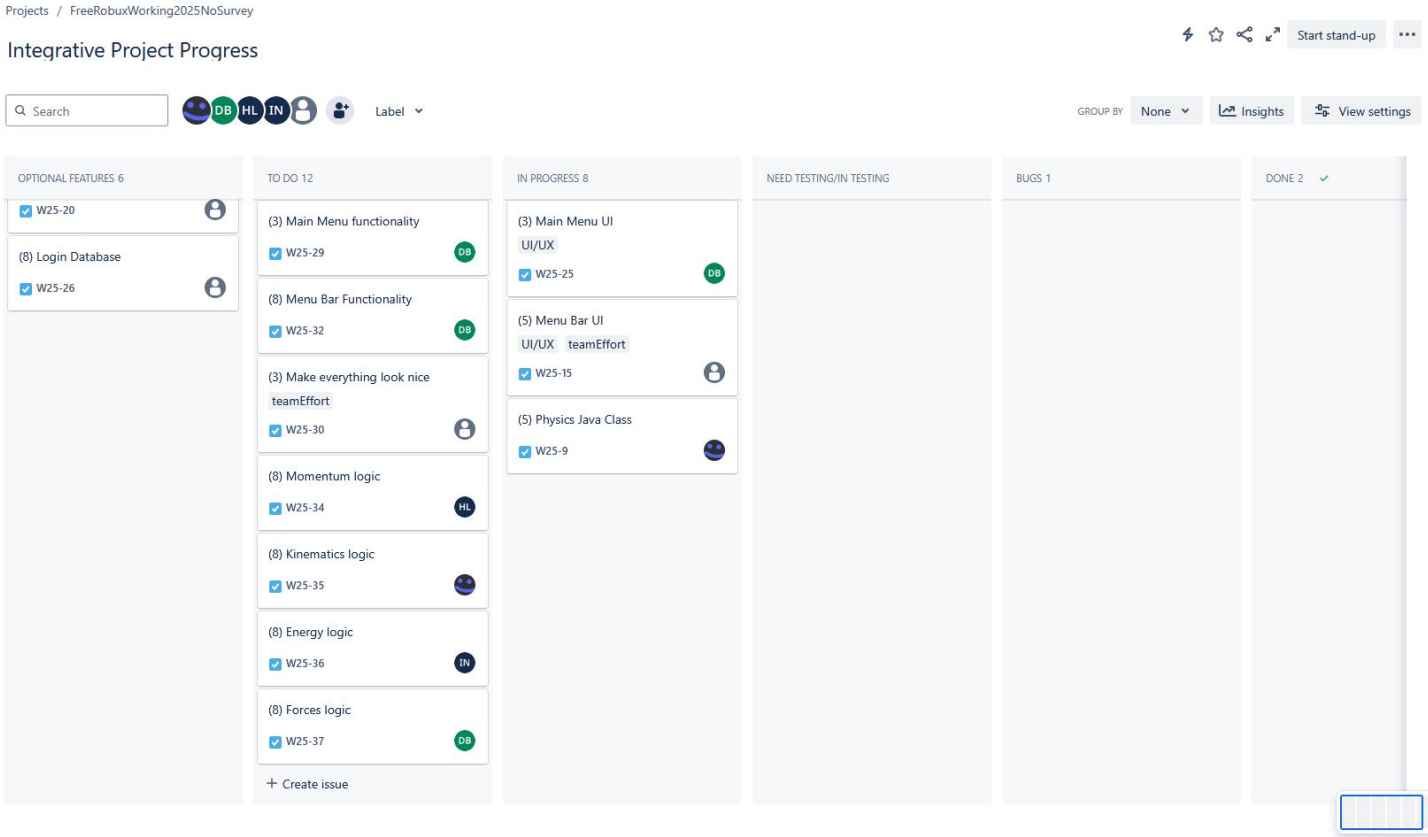
Sprint report

KanBan board part 1



Sprint report

KanBan board part 2



Thank you