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Homework 1

HACS

Inputs/Outputs

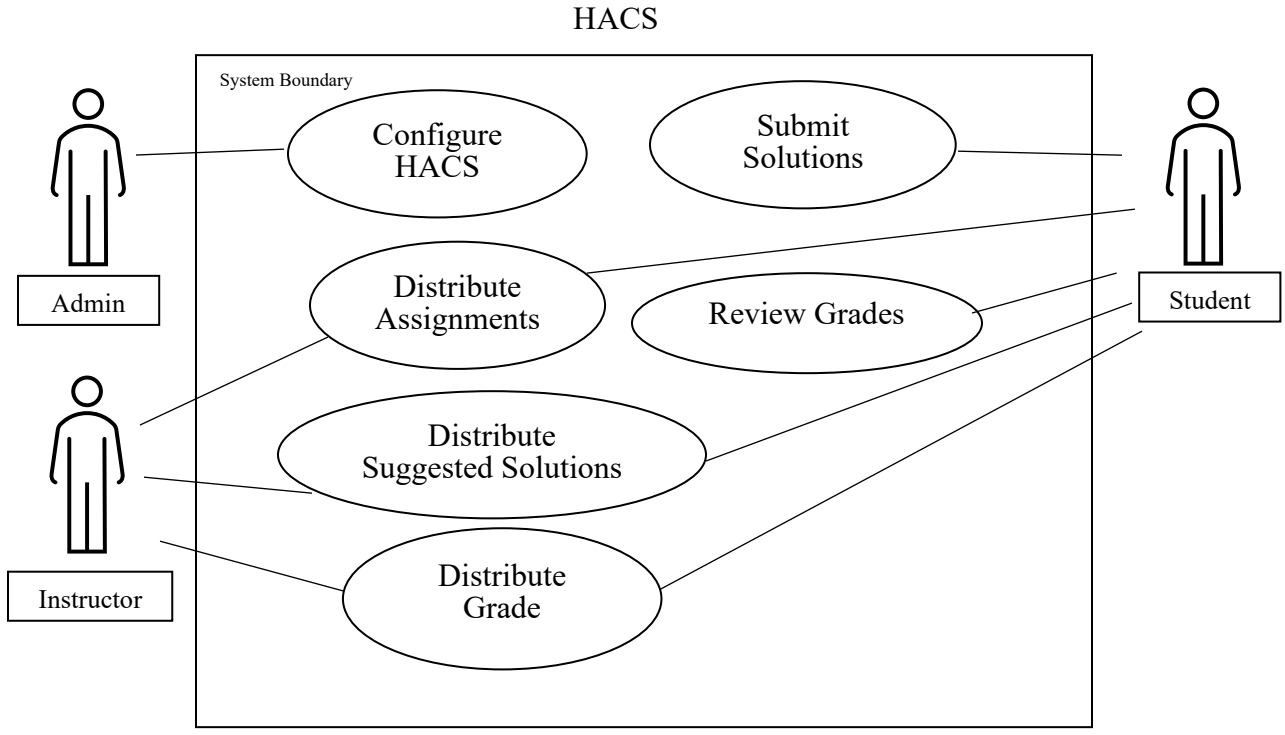
Inputs

- Student Solution Submissions: The finished assignment that the student would submit to the system
- Assignments: The unfinished assignments that the teacher initially distributes to all the students in the distribution list
- Grades: The assignment grades that the teacher records for each student
- Suggested Solutions: The solutions created by the instructor to a specific assignment

Outputs

- Assignments: The unfinished assignments that is distributed to all the students in the distribution list
- System submission notifications: Notifications sent to the students by the system confirming that the assignment has been successfully submitted
- Grades: The assignment grades that the system notifies the students about
- Suggested Solutions: The solutions created by the instructor to a specific assignment

Use Case Diagram



Use Case Scenarios

Use Case: Submit Solution
Actors: Student
Trigger: The submission of the student's solution to the system
Scenario 1: Late Submission

1. The student submits their solution to the assignment after the deadline
2. The system will notify the student that the solution has been accepted
3. The system will block the student from further submissions
4. The system will tag the solution as being late by recording the number of days that the solution was late
5. The system will single out the solution from other students' solutions which were not late.

Scenario 2: Re-submitting

1. The student submits their solution to the assignment
2. The system will notify the student that the solution has been accepted
3. The system will block the student from further submissions
4. The student tries to submit another solution to the system
5. The system will do nothing as a submission has already been accepted

Use Case: Distribute Suggested Solutions
Actors: Instructor, Student
Trigger: The submission of the suggested solutions by the instructor to the system
Scenario 1: Successful Distribution of Suggested Solutions

1. The instructor will submit the suggested solutions of a specified assignment to the system.
2. The system will retain these solutions until a predefined date and time
3. Once that date and time is reached, the system will distribute the suggested solutions to all of the students.

Scenario 2: Unsuccessful Distribution of Suggested Solutions

1. The instructor will submit the suggested solutions of a specified assignment to the system.
2. The system will retain these solutions until a predefined date and time
4. Once that date and time is reached, the system does not distribute the suggested solutions to all of the students.
3. The instructor will manually send the suggested solutions to the students through the system

Rocket Launch System

Inputs/Outputs

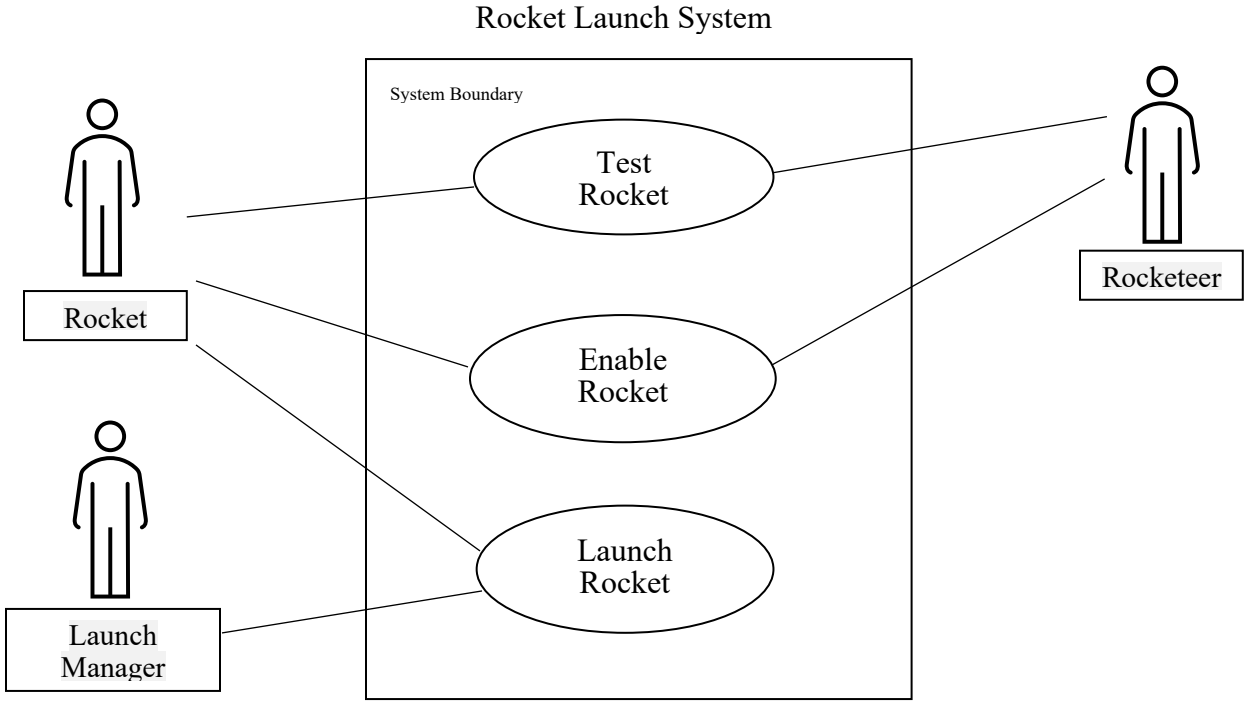
Inputs

- Pressing of the Test button on the Launch Pad Unit (LPU) used to test the battery and circuit
- Pressing of the Enable button on the LPU used to let the Control Unit (CU) know we have enabled the launch sequence
- Pressing of the Ready button on the CU used to let the LPU know that we are ready to launch
- Pressing of the Launch button on the CU used to launch the rocket

Outputs

- Green LPU light: Used to let the Rocketeer know the battery is charged and the circuit is closed
- Red LPU light: Used to let the Rocketeer know that the launching sequence of the rocket has been enabled
- Red CU light: Used to let the Rocketeer know that the LPU successfully acknowledged the ready command from the CU and that the rocket is ready for launch
- Green CU light: Used to let the Rocketeer know that the LPU successfully acknowledged the launch command from the CU and that the rocket will begin to launch

Use Case Diagram



Use Case Scenarios

Use Case: Test Rocket
Actors: Rocketeer, Rocket
Precondition:

1. The rocketeer inserts the battery to the LPU
2. The rocketeer wires the igniter to the LPU

Trigger: Test Button Pushed
Scenario 1: Successful Test

1. The rocketeer pushes the test button on the LPU
2. A low current is sent through the wire connecting the LPU to the rocket
3. If the battery is charged and the circuit through the igniter is closed, the green light on the LPU will come on

Scenario 2: Unsuccessful Test

1. The rocketeer pushes the test button on the LPU
2. A low current is sent through the wire connecting the LPU to the rocket
3. If either the battery is not charged or the circuit through the igniter is open, no lights on the LPU will come on
4. The rocketeer checks the battery and the circuit and resolves the issue

Use Case: Launch Rocket
Actors: Launch Manager, Rocket
Precondition:

1. Test Rocket use case results in a successful test
2. Enable Rocket use case produced a red warning light

Trigger: Ready Button Pushed
Scenario 1: Successful Launch

1. The launch manager pushes the ready button on the CU
2. The CU sends a message to the LPU telling it that we are ready to launch
3. If the LPU acknowledges the ready message, the red light on the CU will come on
4. The launch manager pushes the launch button on the CU
5. The CU sends a message to the LPU telling it to launch the rocket
6. If the LPU acknowledges the launch message, the green light on the CU will come on
7. A current is sent through the wire connecting the LPU to the rocket
8. The circuit through the igniter on the LPU is closed, and the rocket launches

Scenario 2: Launch Message not Acknowledged

1. The launch manager pushes the ready button on the Control Unit (CU)
2. The CU sends a message to the LPU telling it that we are ready to launch
3. If the LPU acknowledges the ready message, the red light on the CU will come on
4. The launch manager pushes the launch button on the CU

5. The CU sends a message to the LPU telling it to launch the rocket
5. If the LPU does not acknowledge the launch message, no lights on the CU will come on, and the rocket will not launch
6. The rocketeer checks the LPU to diagnose and resolve the issue