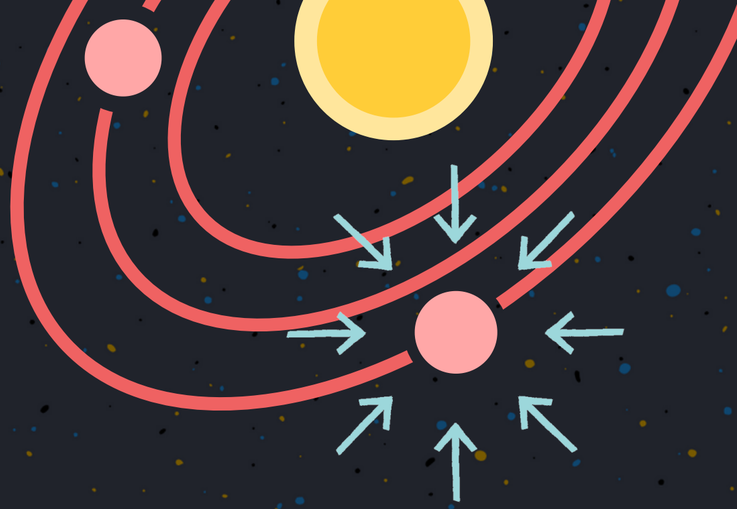
GROUP 2

BLACK HOLE SIMULATOR

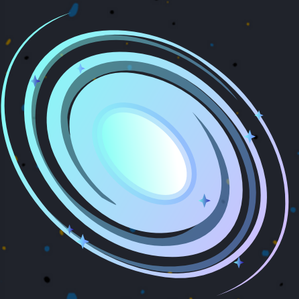
BOSI | CABANGIS | CABILLO | CANCERAN | CERTEZA | JIMENEZ

CONTENTS OF THE PRESENTATION

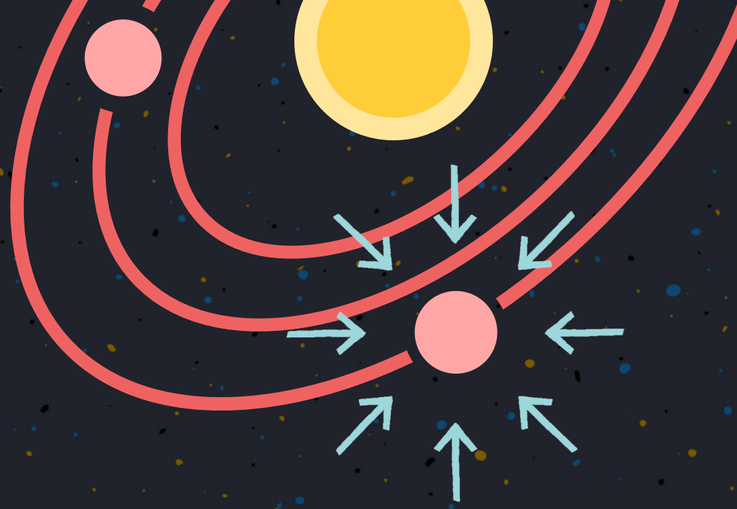
PROJECT DESCRIPTION



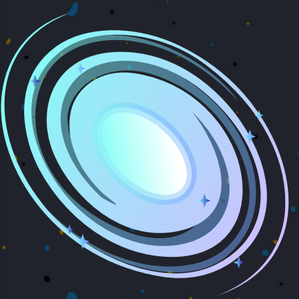
IN THIS PROJECT, A BLACK HOLE SIMULATOR IS USED TO VISUALIZE A BLACK HOLE IN 2D. THE SIMULATOR INCLUDES CUSTOMIZABLE PARAMETERS, SUCH AS THE NUMBER OF CELESTIAL BODIES, THE RADIUS OF THE GALAXY, THE MASS OF THE BLACK HOLE, THE POSITION OF THE BLACK HOLE, AND THE VELOCITY OF THE BLACK HOLE.



PROJECT DESCRIPTION



You can use the simulator to conduct a series of experiments to investigate the effects of different parameters on the behavior of celestial bodies in the galaxy. This project will help you gain a deeper understanding of the physics of black holes and the behavior of celestial bodies in a galaxy. It will also give you valuable experience using simulation tools to conduct experiments and draw conclusions.



PROJECT SCOPE

WORK TO BE ACCOMPLISHED

A BLACK HOLE SIMULATOR THAT WILL ALLOW USERS TO INPUT THE NUMBER OF DOTS, GALAXY RADIUS, BLACK HOLE MASS, BLACK HOLE X-AXIS AND Y-AXIS POSITION, AND BLACK HOLE X-AXIS AND Y-AXIS VELOCITY. THE SYSTEM WILL SIMULATE A BLACK HOLE USING THOSE INPUTS AND DISPLAY HOW THAT BLACK HOLE BEHAVES AND AFFECTS THOSE CELESTIAL BODIES AROUND IT.

STAKEHOLDERS OR USERS

- EDUCATIONAL INSTITUTIONS
- SCIENTISTS
- STUDENTS
- RESEARCHERS

PROJECT SCOPE

PURPOSE OR BUSINESS NEED FOR THIS PROJECT

- THE PRIMARY PURPOSE OF THIS PROJECT IS TO PROVIDE STUDENTS WITH A FUN AND INTERACTIVE WAY TO EXPLORE THE PHYSICS OF BLACK HOLES AND DEEPEN THEIR UNDERSTANDING OF THE BEHAVIOR OF CELESTIAL BODIES IN A GALAXY. AT THE SAME TIME, THEY WILL DEVELOP IMPORTANT SCIENTIFIC SKILLS THAT WILL SERVE THEM WELL IN THEIR FUTURE ACADEMIC AND PROFESSIONAL PURSUITS.

- THE SIMULATOR CAN BE USED BY EDUCATORS TO TEACH STUDENTS ABOUT BLACK HOLES AND THEIR IMPACT ON CELESTIAL BODIES. IT CAN BE USED IN SCIENCE CLASSROOMS AT VARIOUS LEVELS, FROM HIGH SCHOOL TO UNIVERSITY LEVEL. ALSO, IT CAN BE A VALUABLE TOOL FOR RESEARCHERS AND SCIENTISTS WHO ARE STUDYING THE BEHAVIOR OF CELESTIAL BODIES AND THE EFFECTS OF BLACK HOLES ON THEIR ORBITS.

OBJECTIVES

SCHEDULE OBJECTIVES

TO BE ABLE TO DEVELOP AND IMPLEMENT A BLACK HOLE SIMULATOR USING PYTHON WITHIN A SEMESTER

TECHNICAL OBJECTIVES

- TO PROVIDE SCIENTISTS, EDUCATIONAL INSTITUTIONS, AND EDUCATORS AN ACCESSIBLE APPLICATION THAT WILL SIMULATES A BLACK HOLE
- TO PROVIDE A BLACK HOLE SIMULATOR THAT ALLOWS USER TO INPUT UNSPECIFIED DATA
- TO PRESENT A COMPUTER MODEL THAT SIMULATES THE BEHAVIOR OF A BLACK HOLE

DELIVERABLES

TARGET

THIS PROJECT AIMS TO PROVIDE A 2D VISUALIZATION USING A BLACK HOLE SIMULATION TO EDUCATIONAL INSTITUTIONS, SCIENTISTS, AND STUDENTS USING THE INPUTS OF THE USER.

PROJECT CONSTITUENTS

- PROGRAMMING LANGUAGE
  Python (.py) - this is the language used to build the program
- APPLICATION FORMAT
  Executable File (.exe) - this file type enables the application to run
- PLATFORMS
  Window OS - allows the application to launch with regards to its format

INTERNAL DELIVERABLES

01

INITIAL SYSTEM CODE IN (.PY) FORMAT

02

TESTING AND DEBUGGING RESULTS

03

FINAL SYSTEM CODE IN (.PY) FORMAT

04

EXECUTABLE FILE

05

DOCUMENTATION

06

FLOWCHART

07

SYSTEM LOGO

EXTERNAL DELIVERABLES

01 ENTER NUMBER OF DOTS

02 ENTER GALAXY RADIUS

03 ENTER BLACK HOLE MASS

04 ENTER BLACK HOLE POS(POSITION) X

05 ENTER BLACK HOLE POS(POSITION) Y

06 ENTER BLACK HOLE VEL(VELOCITY) X

07 ENTER BLACK HOLE VEL(VELOCITY) Y

08 SIMULATE- TO SIMULATE USING USER'S INPUT

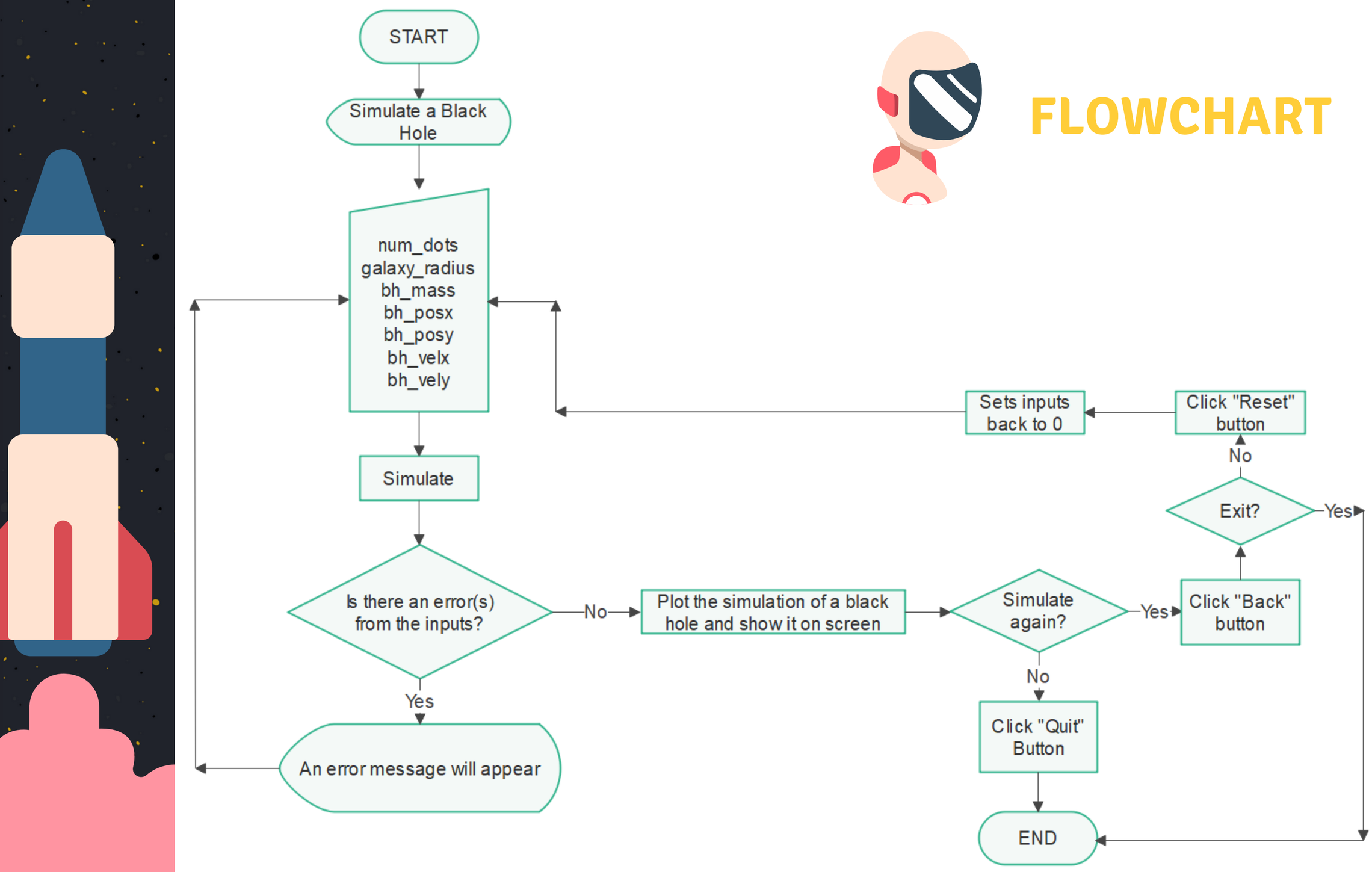
09 RESET- TO RESET ALL INPUTS BACK TO ZERO

10 EXIT- TO CLOSE THE SYSTEM

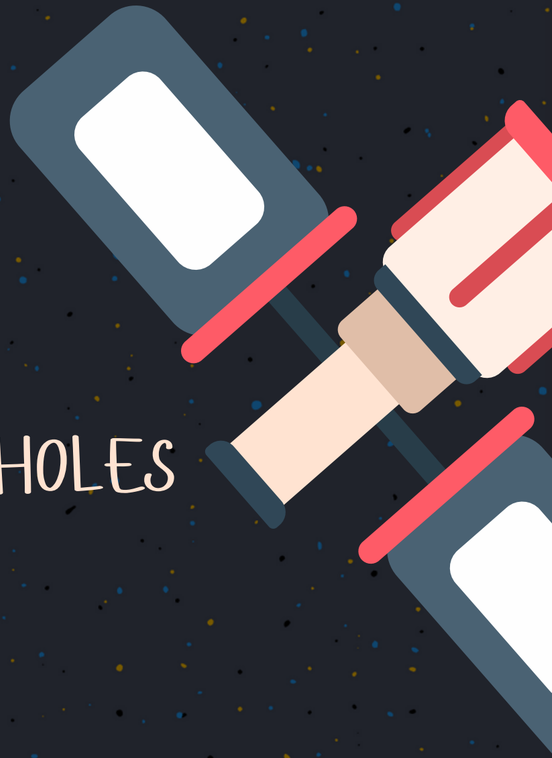
11 BACK- TO RETURN TO MAIN MENU

12 QUIT- TO STOP THE SIMULATION THEN CLOSE THE SYSTEM

FLOWCHART


START
Simulate a Black Hole
num_dots
galaxy_radius
bh_mass
bh_posx
bh_posy
bh_velx
bh_vely
Simulate
Is there an error(s) from the inputs?
No
Yes
An error message will appear
Plot the simulation of a black hole and show it on screen
Simulate again?
Yes
No
Click "Back" button
Exit?
Yes
No
Click "Reset" button
Sets inputs back to 0
Click "Quit" Button
END

CLIENT/USER REQUIREMENTS



ANYONE WHO IS INTERESTED IN STUDYING BLACKHOLES OR WANTS TO SEE HOW THEY WORKS:

- EDUCATIONAL INSTITUTIONS
- STUDENTS
- SCIENTIST
- RESEARCHERS

USER MUST HAVE PASSION IN GETTING TO KNOW BLACK HOLES TO APPREACIATE THE SIMULATION

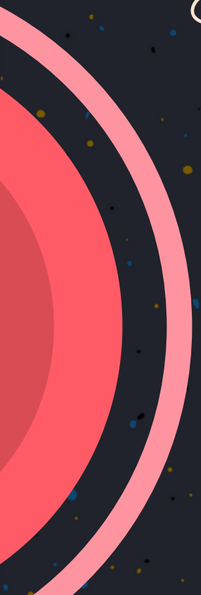
SUCCESS FACTORS

GROUP-CENTERED

THE GROUP HAS ACCOMPLISHED CONCEPTUALIZING AND CREATING A WORKING MODEL AND SIMULATION OF A BLACK HOLE.

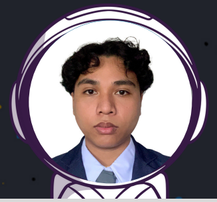
OBJECTIVE-CENTERED

THE OBJECTIVES OF THIS PROJECT AND THE SYSTEM ITSELF, AS STATED IN THE PREVIOUS SLIDE, WERE SUCCESSFULLY ACCOMPLISHED



PROJECT TEAM AND RESPONSIBILITIES

BOSI, IDAN JOSH
PROJECT MANAGER



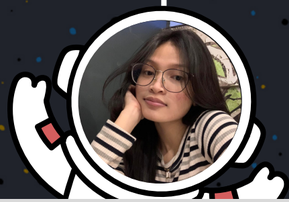
BOSI, IDAN JOSH
DEVELOPER

CABILLO, JOHN DARREL
DEVELOPER

CANCERAN, PAUL HAYDRICK
SYSTEM ANALYST

CABANGIS, ADRIAN CURTIS
BUSINESS ANALYST

JIMENEZ, JEWELLE NIKA
TECHNICAL WRITER



CERTEZA, DIANA ROSE
DESIGNER

IMPLEMENTATION

TASKS / ACTIVITIES

OUR MAIN TASK IS TO PRODUCE A SYSTEM. TO DO THIS WE HAVE DONE THE FOLLOWING:

- CONCEPTUALIZE PROJECT TO MAKE
- DESIGN A PROGRAM
- DEVELOP A PROGRAM
- PRESENT THE ACCOMPLISHED TASK

TOOLS / TECHNOLOGY

- VISUAL STUDIO CODE
- PYTHON
- CANVA
- YOUTUBE

PROCEDURE

AGILE METHODOLOGY: SCRUM

PROJECT CHANGE CONTROL PROCESS

SCRUM USING ITERATION PROCESS

PROJECT SCHEDULES AND MILESTONES

PROJECT IDENTIFICATION

FEBRUARY 3, 2023

PROJECT DESIGN

FEBRUARY 10, 2023

PROJECT DEVELOPMENT

FEBRUARY 13, 2023

PROJECT PRESENTATION

FEBRUARY 21, 2023

REFERENCES

1. BLACK HOLE SIMULATION

YOUTUBE:
HTTPS://WWW.YOUTUBE.COM/WATCH?V=AMZIAGLLM7Q

2. CREATING GUI

YOUTUBE:
HTTPS://WWW.YOUTUBE.COM/WATCH?V=0FAGBSXUDHO&T=1260S


PROJECT
PRESENTATION

QUESTION & ANSWER