



Genesis



Name: Sreelakshmi Orakkan

Ps No.: 99002581





Document History

Ver. Rel. No.	Release Date	Prepared. By	Reviewed By	To be Approved By	Remarks/Revision Details
1	17-09-20	Sreelakshmi	Pagala Prithvi Sekhar, Srinivas K, Mukherjee Nilaori, Middya Anawar Hossain	Pagala Prithvi Sekhar, Srinivas K	
2	18-09-20	Sreelakshmi	Pagala Prithvi Sekhar, Srinivas K, Mukherjee Nilaori, Middya Anawar Hossain	Pagala Prithvi Sekhar, Srinivas K	
3	19-09-20	Sreelakshmi	Pagala Prithvi Sekhar, Srinivas K, Mukherjee Nilaori, Middya Anawar Hossain	Pagala Prithvi Sekhar, Srinivas K	



Table of Contents

CHECKLIST	
ACTIVITY AND TASKS	4
ACTIVITY 1- SYSTEM/SOFTWARE DEVELOPMENT	
ACTIVITY 2 – AGILE ASPECTS	
ACTIVITY 3 –CI WORKFLOW FOR C PROGRAMMING	
LIST OF FIGURES	
ACTIVITY 1: SYSTEM/SOFTWARE DEVELOPMENT	
1. REQUIREMENTS: DSLR	6
2. RESEARCH	6
3. PRODUCT DEFINITION	
4. SWOT ANALYSIS	
5. HIGH LEVEL REQUIREMENT	
6. LOW LEVEL REQUIREMENT	
7. DESIGN	10
8. TEST PLAN	14
9. REQUIREMENTS	18
10. Test Plan	18
ACTIVITY 2: AGILE ASPECTS	20
1. REQUIREMENTS	20
2. USER STORIES	20
ACTIVITY 3: CI WORKFLOWS FOR C PROGRAMMING	22
1. REQUIREMENTS	22
2. UML DIAGRAMS	22
3. TEST PLAN	23
4. CI	25
REFERENCES	25
APPENDIX	



Checklist

- Installation of SW on Phone and Desktop
- Additional Aspects ...

Activity and Tasks

Activity 1– System/Software Development

- Sub Tasks
- Complete and Evolve

Activity 2 - Agile Aspects

- Requirements
- User stories

Activity 3 -CI Workflow for C Programming

- Sub Tasks
- Complete and Evolve



List of Figures

Figure 1 Fujifilm launched the world's first fully digital consumer camera Fujix DS-1P in 1988	6
Figure 2 Kodak DCS camera with its Digital Storage Unit (DSU)	7
Figure 3 Component Diagram	10
Figure 4 Profile Diagram	
Figure 5 Class Diagram	
Figure 6 Composite Structure Diagram	
Figure 7 Use Case Diagram	
Figure 8 Communication Diagram	
Figure 9 Sequence Diagram	13
Figure 10 Activity Diagram	
Figure 11 Sequential Diagram	
Figure 12 State machine Diagram	



Activity 1: System/Software Development

1. Requirements: DSLR

There are many types of cameras out there, but when it comes to advanced, interchangeable lens models, nothing is more iconic than the DSLR. The popularity of the DSLR has waned in recent years with the rise of smaller mirrorless cameras, but it's still a beloved format by many for a few key reasons.

A DSLR camera is a digital single-lens reflex camera. Inside the camera body is a mirror that reflects the light coming from the lens up into an optical viewfinder, by way of either a prism (in higher-end DSLRs) or a series of additional mirrors (usually in lower-end models). This is how you can see what you're shooting, right through the lens, and is where the term "reflex" comes from — referring to mirror's reflection.

2. Research

2.1 Aging

In 1975, Kodak engineer Steve Sasson created the first-ever digital camera. It was built using parts of kits and leftovers around the Kodak factory, and an early CCD image sensor from Fairchild in 1974. The camera was about the size of a breadbox and it took 23 seconds to capture a single image. It took 0.01-megapixel images shot only in black and white that were saved to a cassette tape.

First unveiled at the 1988 Photokina trade show in Köln Germany, Fujix DS-1P is considered as the first true digital camera. It used to record images in a 2MB SRAM memory card that held 5 to a maximum of 10 photographs. Like the Kodak camera, this Fuji-made camera was never sold.



Figure 1 Fujifilm launched the world's first fully digital consumer camera Fujix DS-1P in 1988

In 1991, Kodak created the first first-ever digital SLR. The Kodak Digital Camera System (DCS) was essentially a modified Nikon F3 whose film chamber and winder were modified to make room for sensors. The camera had a built-in 1.3-megapixel Kodak CCD to capture images. The camera cost \$20,000 and required an external data storage unit that the photographer needed to wear on a shoulder strap and was connected via cable.



Figure 2 Kodak DCS camera with its Digital Storage Unit (DSU).

In 1994, Kodak and Associated Press launched a digital SLR designed for photojournalists. Based on a Nikon N90 body, the 1.3-megapixel camera had removable memory cards and up to ISO 1600. The Vancouver Sun became the world's first newspaper to convert to all-digital photography with this camera. Originally priced at \$17,950, but discounted to \$16,950 for AP members.

The Ricoh RDC-1 was the first digital camera to have a dedicated movie mode. Its video recording capabilities were fairly limited, but still, this camera was pretty revolutionary. The camera could record 5-second 768×480-pixel clips at 30 frames per second, and saved them in the then-new MPEG format. It was an expensive camera, costing an estimated \$1500.

Mirrorless cameras will dominate the digital camera market in the future. Most typical consumers will choose mirrorless for weight, size and better in-camera technology factors, while others will continue to shoot with DSLR and Medium Format cameras, or shoot with both. In the next five or more years, it is expected many digital cameras, whether mirrorless or DSLR to have the ability to share photographs over wireless networks.

2.2 Cost Gradation

FEATURES	Canon 1d x DSLR Camera	Nikon D3300 DSLR Camera Body AF-P DX Nikkor 18 - 55 mm Black	Canon EOS 1500D DSLR Camera Single Kit with 18-55 IS II lens
Price in Rs.	6,00,000	33,950	28,129
Brand	Canon	Nikon	Canon
Model	1d x	D3300 DSLR	EOS 1500D
Shutter Speed Range	1/4000 sec	1/4000 sec	1/4000 sec



Optical Sensor	1080 MP	24.2 MP	24.1 MP
Resolution			
Lens Type	1DX	Image Stabilization Technology	Single Kit with 18-55
		The lens offers electronic VR	IS II lens
		(Vibration Reduction) and	
		effectively reduces any blur	
		during capturing a photo or video	
Image Format	1080	EXIF 2.3, DCF 2.0, DPOF	JPEG, RAW (14-bit
			Canon original)
Video Format	HD	MOV, MPEG, Other	1080p recording at
			30p
Screen Size	2.3 cm	7.62 cm	2 cm
Video Display	1920 x 1080	1920 x 1080	1920 x 1080
Resolution			
Dust reduction	No	No	Yes
Shooting	No	Yes	Yes
Modes			
Self-Timer	No	Yes	Yes
Wi-Fi	No	No	Yes
Sensor Type	BSI CMOS	DX Format CMOS Image	CMOS
		Sensor	
GPS	No	Yes	Yes
USB	No	Yes	No
Memory Card	Compact Flash	Memory card and Bag	SD Card
Туре			
Battery	Lithium	rechargeable EN-EL14a Li-	
		ion battery	Lithium
Weight	400 g	460 g	475 g

3. Product Definition

This product has a modest feature-set, but a wealth of imaging capabilities. It revolves around a CMOS sensor, which afford Full HD 1080p/30 fps video recording, a 3 fps still shooting rate, and expanded sensitivity to ISO 12800. A 3.0" 920k-dot LCD monitor lets you review imagery and shoot in live view while built-in Wi-Fi. More features of the product are listed below:

FEATURES	
Price in Rs.	40,000
Shutter Speed Range	1/4000 sec
Optical Sensor Resolution	24.2 MP



Lens Type	Single Kit with 18-55 IS II lens
Image Format	JPEG, RAW (14-bit Canon original)
Video Format	1080p recording at 30p
Screen Size	7.62 cm
Video Display Resolution	1920 x 1080
Dust reduction	Yes
Shooting Modes	Yes
Self-Timer	Yes
Wi-Fi	Yes
Sensor Type	CMOS
GPS	Yes
USB	Yes
Memory Card Type	SD Card
Battery	Lithium
Weight	400 g

4. SWOT Analysis

- Strength: There is a wide variety of features that comes under this product. They are Dust reduction, Shooting Modes, Self-Timer, Wi-Fi, Sensor Type, Wi-Fi and GPS.
- Weakness: The optical sensor resolution is 24.2 MP only using Single Kit with 18-55 IS II lens
- Opportunities: Trying to make DSLR cameras smaller and compact and the ability to instantly share photos taken in DSLRs.
- Threat: Since the product can be connected to Wi-Fi network, this makes them more vulnerable to threats as attackers can inject ransomware into both the camera and PC it is connected to.

5. High level Requirement

This product should be one-handed shooting easy and offers good grip using an ample rubber cladding on the right side of the camera. On the left, a flap which covers inputs for a wired remote, a Mini-USB port, and a Mini-HDMI port. The optical viewfinder offers 95 percent field of view and there's a little dial for diopter adjustment. The 1500D offers a pop-up flash with the option of connecting external flashes too via the hot shoe connector. Have plenty of buttons for accessing quick settings ('Q' button), shortcut buttons for drive mode, ISO, white balance and autofocus adjustments. These buttons are also used for navigating the menus. There's a dedicated LED light at bottom which lights up when the Wi-Fi connection is in use.

6. Low level requirement

The low level requirements to meet the user needs are listed below:

- Minimum of 10 megapixels
- Full manual control of aperture, shutter speed, focus and flash



- Capability for interchangeable lenses
- Zoom lens (18mm-55mm) (up to 135mm preferred)
- Photo tripod
- Memory card 16 Gb (SDHC)
- HD Video Recording capability (preferably with an audio input jack)

7. DESIGN

7.1 Structural Diagram:

(i) High level requirement

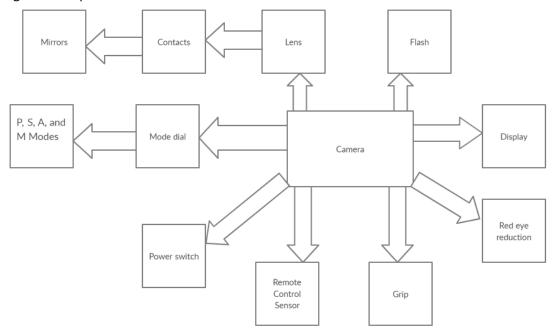


Figure 3 Component Diagram



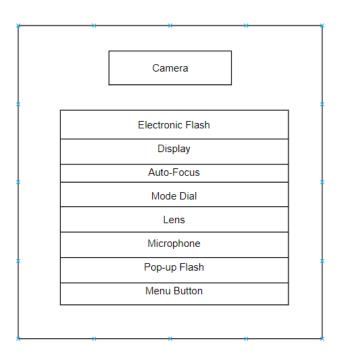


Figure 4 Profile Diagram

(ii) Low level requirement

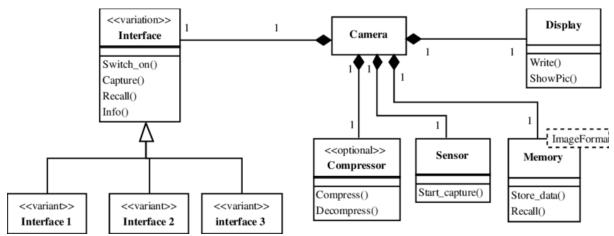


Figure 5 Class Diagram



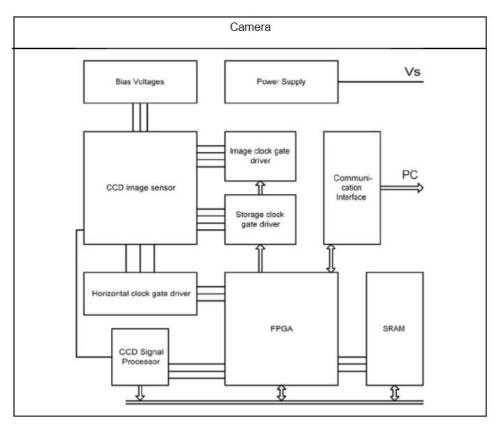


Figure 6 Composite Structure Diagram

7.2 Behavioural Diagram:

(i) High level requirement

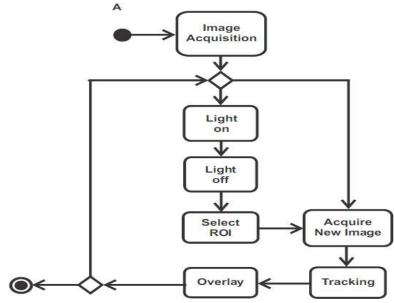


Figure 7 Use Case Diagram



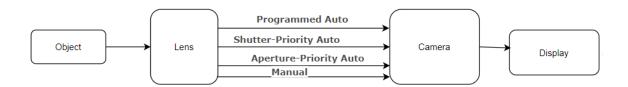


Figure 8 Communication Diagram

(ii) Low level requirement

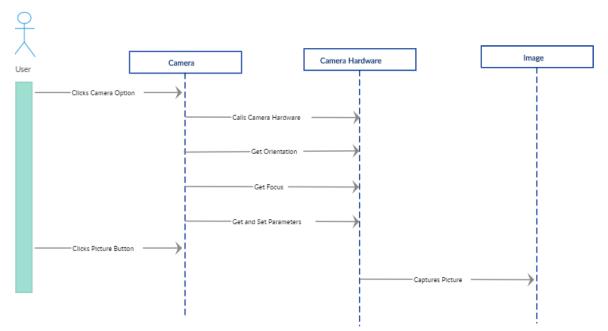


Figure 9 Sequence Diagram

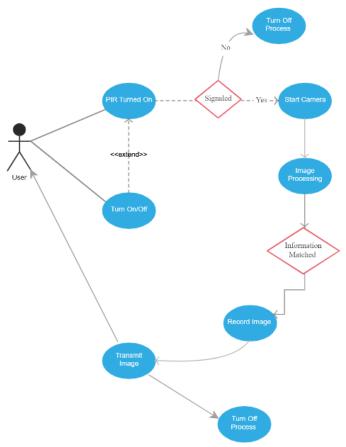


Figure 10 Activity Diagram

8. Test Plan

8.1 Requirement Based Test cases

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/Fail
TU01	Verify the availability of the High Dynamic Range (HDR) feature in	 Switch on Camera Click a picture of an object 	HDR image of the object	The image captured should meet the acceptance level	As Expected	Pass
	Camera.	3. Observe the image captured on screen				



TU02	Verify the Camera is High Definition (HD) quality	 Switch on Camera Click a picture of an object Observe the image 	HD image of object	The image captured should meet the acceptance level	As Expected	Pass
		captured on screen				
TU03	Verify the Zoom In/Out	1. Switch on Camera	Image of object	The camera should be able	As Expected	Pass
	functionality in Camera	2. Try to zoom in and zoom out by rotating the ring in camera	magnified and reduced	to zoom in closely and zoom out		
		3. Observe the image on display when you zoom in and zoom out				
TU04	Auto- Flash	1. Switch on Camera	Image of object in	The camera should be able	As Expected	As Expected
		2. Try to capture image of the in dark place	dark room	to automatically enable flash when the image	·	
		3. Notice if the flash turned on automatically on click		is captured ina dark room		

8.2 Scenario Based Test cases



Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/Fail
TU05	Verify the image of a moving object	 Switch on Camera Click a picture of an object which is moving Observe the image captured on screen 	The still image of the object	The image captured of the moving object should not be hazy	As Expected	Pass
TU06	To verify the modes in camera	 Switch on Camera Change the mode of camera Click a picture of an object Observe the image captured on screen 	The image of the object with respective mode	The image should be captured in the mode selected	As Expected	Pass
TU07	To verify night mode is off by default	 Switch on Camera Select night mode Turn off camera Switch on again and observe the mode on camera present 	The Camera should not be in night mode	The night mode turns off by default	As Expected	Pass



TU08	Verify if the	1. Switch on Camera	Face	The camera	As	Pass
	camera is able		recognition	should focus on	Expected	
	to detect the	2. Focus the camera on a	on the image	the face more		
	face in the	face		than the		
	target picture			surroundings		
	region.	3.Check if the camera		while capturing		
		responds on detection on		an image		
		face				

8.3 Boundary condition based test cases

Test Case ID	Test Scenario	Test Steps	Test Data	Expect ed Results	Actual Results	Pass /Fail
TU09	To check how the camera function when the battery falls low	 Switch on Camera Drain out the battery of camera Try to operate camera at very low battery level 	Able to operate functions without taking too much battery	Able to operate the camera with low battery	Operating camera drains out the battery entirely and the camera shuts down	Fail
TU10	Try to zoom in and zoom out beyond the range	 Switch on Camera Try to zoom in and out beyond range using the ring of the camera Observe the display screen 	Image of the object in close and far away	Able to zoom in and out as much as you want to move the ring	The camera cannot zoom in or out beyond its range	Fail



The camera

displays not

Fail

TU11 Capture 1. Switch on Camera The image of Trying to

3. Observe the screen

image in the object get a

camera 2. Try to capture image even picture of enough when there when the memory is full the object memory to

is not take picture

memory

enough

9. Requirements

ID	Description
TU01	High Dynamic Range (HDR) feature
TU02	High Definition (HD) picture quality
TU03	Zoom in and zoom out functionality
TU04	Auto-flash
TU05	Capture still image of a moving object
TU06	Availability of different modes – Night, Landscape, Portrait, Sport
TU07	Night mode off by default
TU08	Face recognition/detection
TU09	Battery capacity
TU10	Maximum zoom in and out range
TU11	Storage memory

10. Test Plan

ID	Description	Pre-condition	Expected input	Expected output	Actual output
TU01	Verify the availability of the High Dynamic Range (HDR) feature in	Mirrorless camera	Battery input	The image captured should meet the acceptance level	As Expected
TU02	Verify the Camera is High Definition (HD) quality	HDR image of the object in camera	Battery power	The image captured should meet the acceptance level	As Expected
TU03	Verify the Zoom In/Out functionality in Camera	A ring that moves to do the function	Battery power	The camera should be able to zoom in closely and zoom out	As Expected
TU04	Auto- Flash	A flash	Battery Power	The camera should be able	As Expected



TU05	Verify the image of a moving object	Detect moving object	Battery power, moving object	to automatically enable flash when the image is captured in a dark room The image captured of the moving object should not be hazy	As Expected
TU06	To verify the modes in camera	A ring to change modes	Battery power	The image should be captured in the mode selected	As Expected
TU07	To verify night mode is off by default	The Camera should not be in night mode	Battery power	The night mode turns off by default	As Expected
TU08	Verify if the camera is able to detect the face in the target picture region.	The camera should focus on the face more than the surroundings while capturing an image	Battery power	The camera should focus on the face more than the surroundings while capturing an image	As Expected
TU09	To check how the camera function when the battery falls low	Able to operate the camera with low battery	Battery power	Able to operate the camera with low battery	Operating camera drains out the battery entirely and the camera shuts down
TU10	Try to zoom in and zoom out beyond the range	Able to zoom in and out as much as you want to move the ring	Battery power, move the ring	Able to zoom in and out as much as you want to move the ring	The camera cannot zoom in or out beyond its range
TU11	Capture image in camera when there is not enough memory	Trying to get a picture of the object	Battery power	Trying to get a picture of the object	The camera displays not enough memory to take picture



Activity 2: AGILE ASPECTS

1. Requirements

Many traditional project teams run into trouble when they try to define all of the requirements up front, often the result of a misguided idea that developers will actually read and follow what the requirements document contains. The reality is that the requirements document is usually insufficient, regardless of how much effort goes into it, the requirements change anyway, and the developers eventually end up going directly to their stakeholders for information anyway (or they simply guess what their stakeholders meant). Agilists know that if they have the ability to elicit detailed requirements up front then they can also do the same when they actually need the information. They also know that any investment in detailed documentation early in the project will be wasted when the requirements inevitably change. Agilists choose to not waste time early in the project writing detailed requirements documents because they know that this is a very poor way to work.

1.1 Heart of Agile requirements

Agile requirements come in many shapes and forms, but the most common form is a User Story. Let's understand what a User story is all about.

User Stories, or stories as some might call it (or them), represent customer requirements in a simple written narrative rather than a tedious comprehensive document. It drives forward conversations within Agile teams for planning and estimation. They contain a number of criteria that can be used to determine when a User Story is considered to be complete. A good narrative for a User Story would be something that adds value for the customer, partner, consumer, or stakeholder.

Several stories make a Product Backlog and ideally the whole Agile team is responsible for the health of the Product Backlog.

Theme

A DSLR camera that can give the best photography experience for different types of photographers. It allows them to change the mode of photography they desire and capture the beautiful events they come across.

Epic

With an appropriate lens this DSLR camera can capture high quality images in different modes such as auto, portrait, landscape, macro, sports, and night mode. It also has an automatic face detection system that focus on the face than the surrounding.

2. User Stories

ID	User story	Effort time
U01	As a photographer, I want a DSLR camera that can automatically turn on the	10 hours
	flash when it's too dark and can turn off and on the flash feature manually.	
	This full-frame camera should have the best overall image quality with clean,	
	noise-free images going well into the ISO 2000 range. It should deliver a	
	great image quality (a little bit shy on the dynamic range, though), and have	
	a blazing fast autofocus and a very fast (10 fps) shutter. Also include,	
	powerful sensors with very high megapixel counts. As such, the final image is	
	very high quality and professional grade. There should be an optical	
	viewfinder that allows you to view the frame in actuality, rather than relying	



	on a digital LCD screen. It should have the ability to change lenses and allows you unlimited possibilities.	
U02	As a person who likes to take pictures to treasure memories, I need a DSLR camera that can automatically recognize a face and focus on the face more than the surrounding. But to be able to produce beautiful images that perfectly capture every emotion, every happy moment, and every glorious detail of the bride and groom's most special day. An insanely high resolution with 42.4MPWith that much resolution to play with, a professional can go crop-crazy while not losing image quality. The camera's small weight is also desirable and contribute to a long battery life. It should also be a delight to shoot videos in HD and also have an HDMI port to connect to other devices for display like a television. Mostly it should be easy to use and user-friendly, compact size. The built-in lenses should focus-free, having stationary apertures.	7 hours
U03	I like to travel so I want a DSLR that can capture pictures in various modes like auto, portrait, landscape, macro, sports, and night. This should be the best mirrorless camera body for shooting wildlife and sports photography. The silent shooting mechanism that is inherent to mirrorless systems, is ideal for wildlife photography. The lens should be fast enough to catch all of the action. Plus, it must be taken into account the battery life of the camera body. The bodies should tolerate the sport weather sealing and are very durably built that are meant to withstand all the elements.	9 hours



Activity 3: CI Workflows for C Programming

1. Requirements

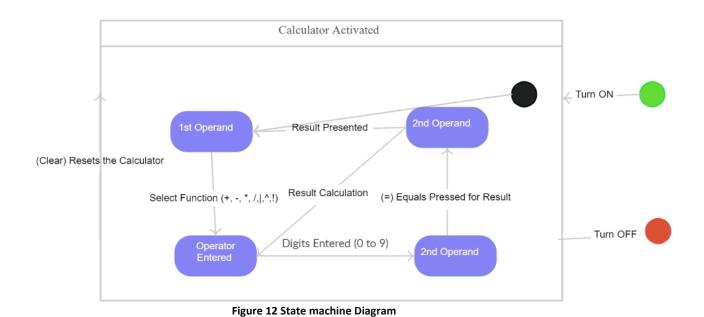
ID	Description
C01	Take two digits
C02	Select the operation
C03	Add the digits
C04	Subtract the digits
C05	Multiply the digits
C06	Divide the digits
C07	Find modulus of the digits
C08	Find the power of a digit
C09	Find the factorial of a digit
C10	Get the correct output
C11	Display the output

2. UML Diagrams



Figure 11 Sequential Diagram





3. Test Plan

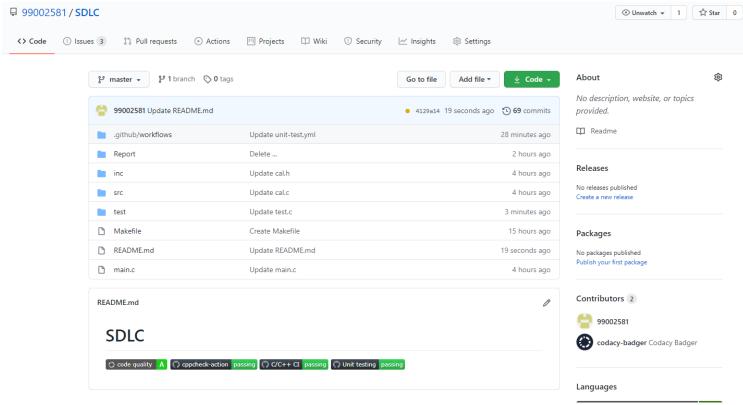
ID	Description	Pre-condition	Expected input	Expected output	Actual output
CT01	Check if two digits are given as input to the calculator	Switch on Calculator	Two digits	Digit1 and Digit2 should get input	Digit1 and Digit2 gets input
CT02	Check the digits gets the correct output for addition	Switch on Calculator	Two digits and the addition operator	Digit1 and Digit2 should add and give the correct answer	Digit1 and Digit2 gives the correct answer
CT03	Check the digits gets the correct output for subtraction	Switch on Calculator	Two digits and the subtraction operator	Digit1 and Digit2 subtract add and give the correct answer	Digit1 and Digit2 gives the correct answer
CT04	Check the digits gets the correct output for multiplication	Switch on Calculator	Two digits and the multiplication operator	Digit1 and Digit2 should multiply and give the correct answer	Digit1 and Digit2 gives the correct answer
CT05	Check the digits gets the correct output for division	Switch on Calculator	Two digits and the division operator	Digit1 and Digit2 should divide and give the correct answer	Digit1 and Digit2 gives the correct answer
CT06	Check the digits	Switch on	Two digits and the	Digit1 and Digit2	Digit1 and Digit2



	gets the correct output for modulus	Calculator	modulus operator	should find modulus and give the correct answer	gives the correct answer
CT07	Check the power of a digit gives the output	Switch on Calculator	Digit and power	The power of a digit should give the correct answer	The power of a digit gives the correct answer
CT08	Check the factorial of a digit is correct	Switch on Calculator	Digit to find the factorial	The factorial of the digit should give the correct answer	The factorial of a digit gives the correct answer
СТ09	Check the addition of two long integers	Switch on Calculator	Two digits and the addition operator	The long integers entered should give the sum of the numbers	The output gives a wrong answer since the calculator takes in only 16bit value
CT10	Check the difference of two long integers	Switch on Calculator	Two digits and the subtraction operator	The long integers entered should give the difference of the numbers	The output gives a wrong answer since the calculator takes in only 16bit value
CT11	Check the product of two long integers	Switch on Calculator	Two digits and the multiplication operator	The long integers entered should give the product of the numbers	The output gives a wrong answer since the calculator takes in only 16bit value
CT12	Check a digit divided by 0	Switch on Calculator	Input a digit and 0	When a digit is divided by zero it should display invalid	The output doesn't generate.
CT13	Check the factorial of a negative number	Switch on Calculator	Input a digit to find factorial	When the factorial is negative it should display "Factorial cannot be found"	The output doesn't generate



4. CI



Link: https://github.com/99002581/SDLC

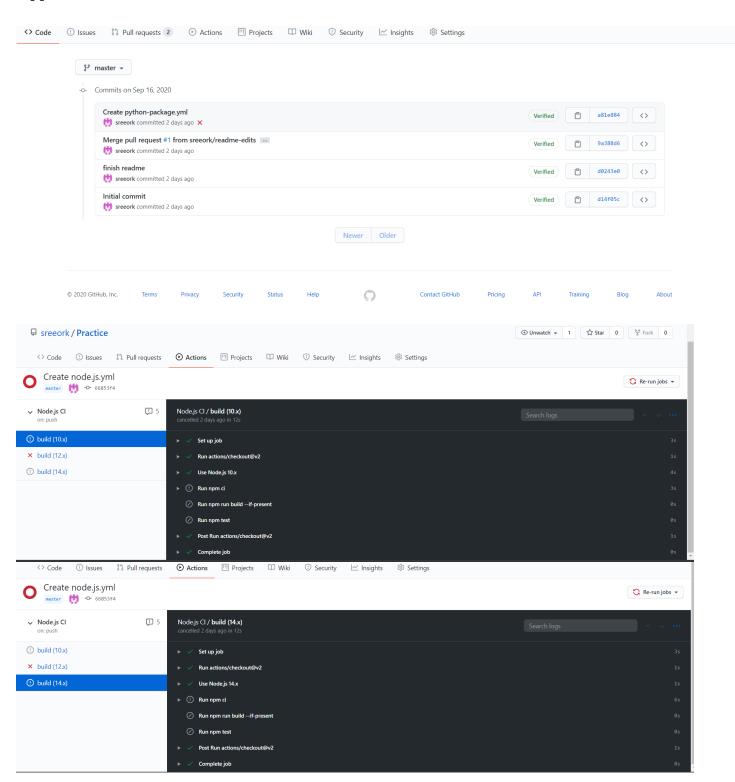
References

- [1] https://creately.com/diagram/example/ilmhym1b3/CALCULATOR%20SEQUENCE%20DIAGRAM
- [2] https://fresh2refresh.com/c-programming/c-programs/c-code-for-calculator-application/
- [3] https://www.pricedekho.com/cameras/dslr+cameras-price-list.html
- [4] https://telehealthtechnology.org/toolkit/digital-camera-dslr-assessment-process-guide/
- [5] https://www.picturecorrect.com/tips/10-features-of-a-dslr-camera-that-you-should-know/
- [6] https://www.digitaltrends.com/photography/what-is-a-dslr-camera/
- [7] https://www.digital-photo-secrets.com/tip/2609/how-dslrs-have-improved-over-the-years/
- [8] https://www.bhphotovideo.com/explora/photography/buying-guide/7-recommended-entry-level-dslr-cameras
- [9] <a href="https://www.agilebusiness.org/page/ProjectFramework_15_RequirementsandUserStories#:~:text=Stories%20should%20represent%20features%20providing,should%20be%20features%2C%20not%20tasks.&text=Stories%20need%20to%20be%20clear,)%2C%20without%20being%20too%20detailed.

[10]http://agilemodeling.com/essays/agileRequirements.htm



Appendix





Link: https://github.com/sreeork/Practice