

ONLINE COMPILER USING CLOUD COMPUTING

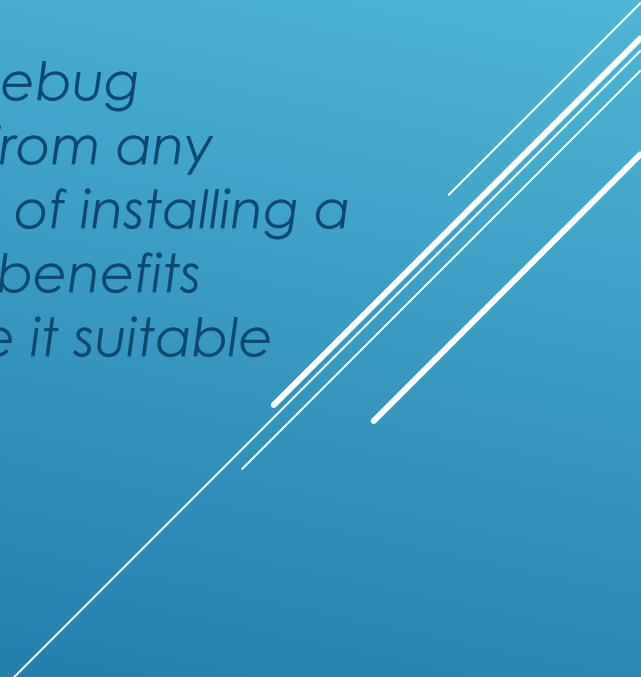
Computer Science Project I – CS691

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INTRODUCTION

In today's fast and competitive world everything is available on internet, and on web. So, we developed an online compiler using cloud computing. The main objective of this project is to develop a centralized compiler that helps to reduce problems like portability storage, cost, and space.

It is the most convenient tool to compile code, remove errors and debug code. Moreover, we can run the web-based application remotely from any network connection that is independent of platform. The challenge of installing a compiler on each machine is also avoided and therefore, these all benefits make this application suitable of cloud based online compiler make it suitable for performing online exams.

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PERSONA



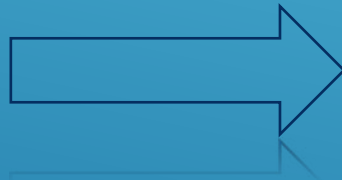
I am John pursuing Master's from a well-known university. Being a Graduate student in Computer Science, writing and compiling codes in different languages is part of our daily life. Sometimes we find it difficult to get the subscription for different compiler because it's costly and it will become more costly if we are taking subscription for different compiler for each coding languages.

Therefore, we yearn for a single platform where we can compile at least more frequently used languages (Java, Python, C#, C, C++) at the same platform by making the coder's life easier.

MODULES & PHASES

Modules

- 1.Registration
- 2.Login
3. Code :-
 - 1) Enter source code
 - 2) Compile
 - 3) Save



Phases

- Technology
- Research
- Gathering
- Requirements
- Requirement Analysis
- Implementation
- User Experience
- Deployment

3) save

Deployment

MVP

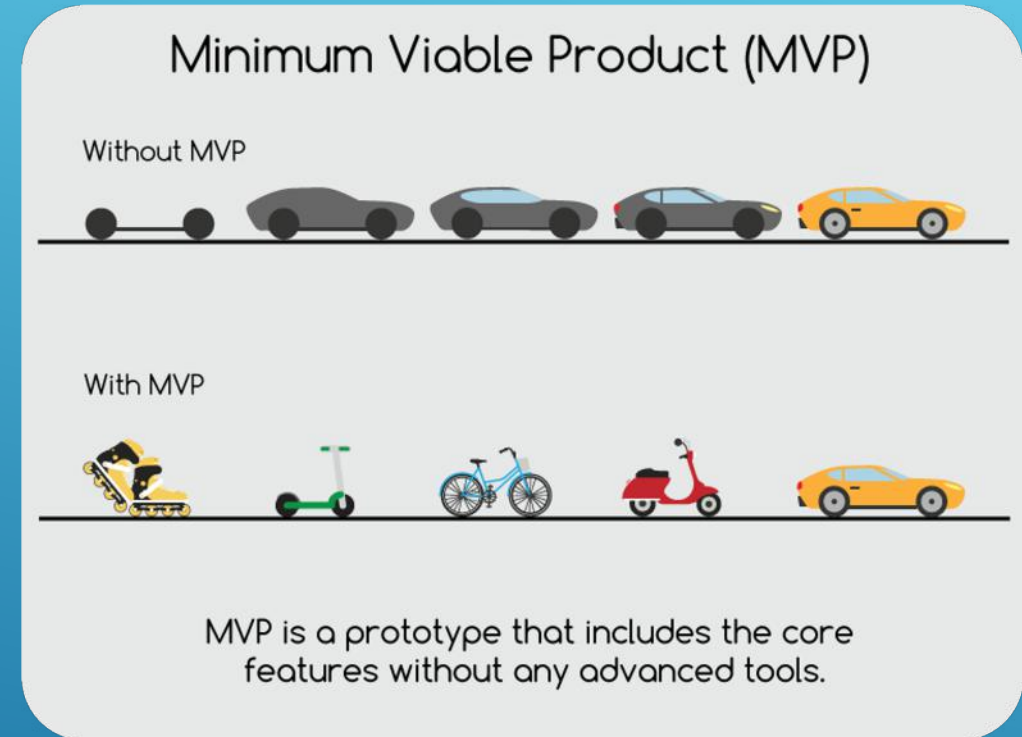
Which Problem does it solve!

It can be hectic for students or working professionals to download IDEs and virtual machines for individual languages to run their programs in very short amount of time.

Minimum :- An application which can compile or debug the code and get the desired output.

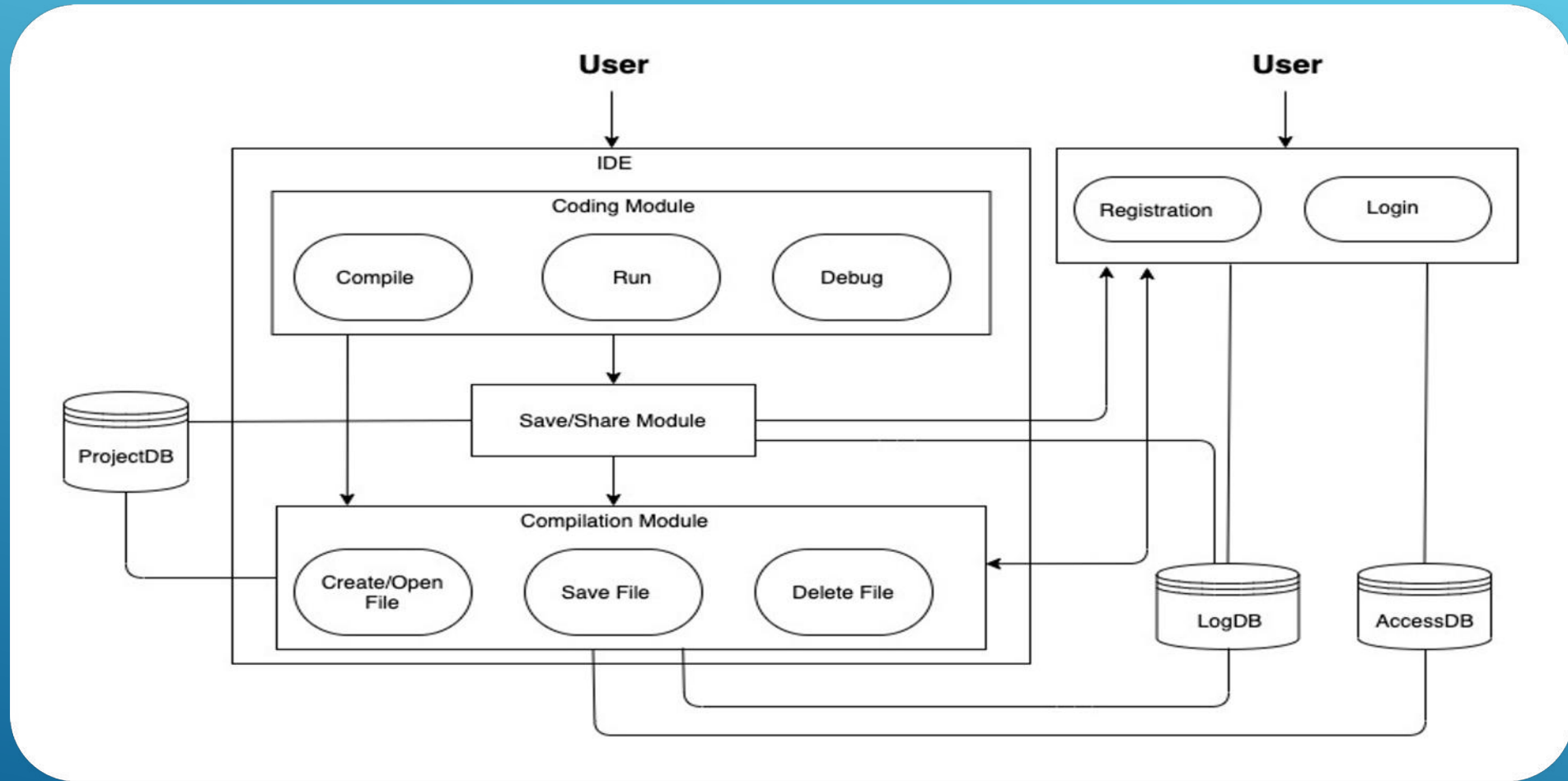
Viable : An online platform for everyone where anyone can run the code in any of the given programming languages with features like save the source code.

Minimum + Viable :- We are presenting a product which is based on cloud computing with features like login, registration with authentication and compilation of source code.

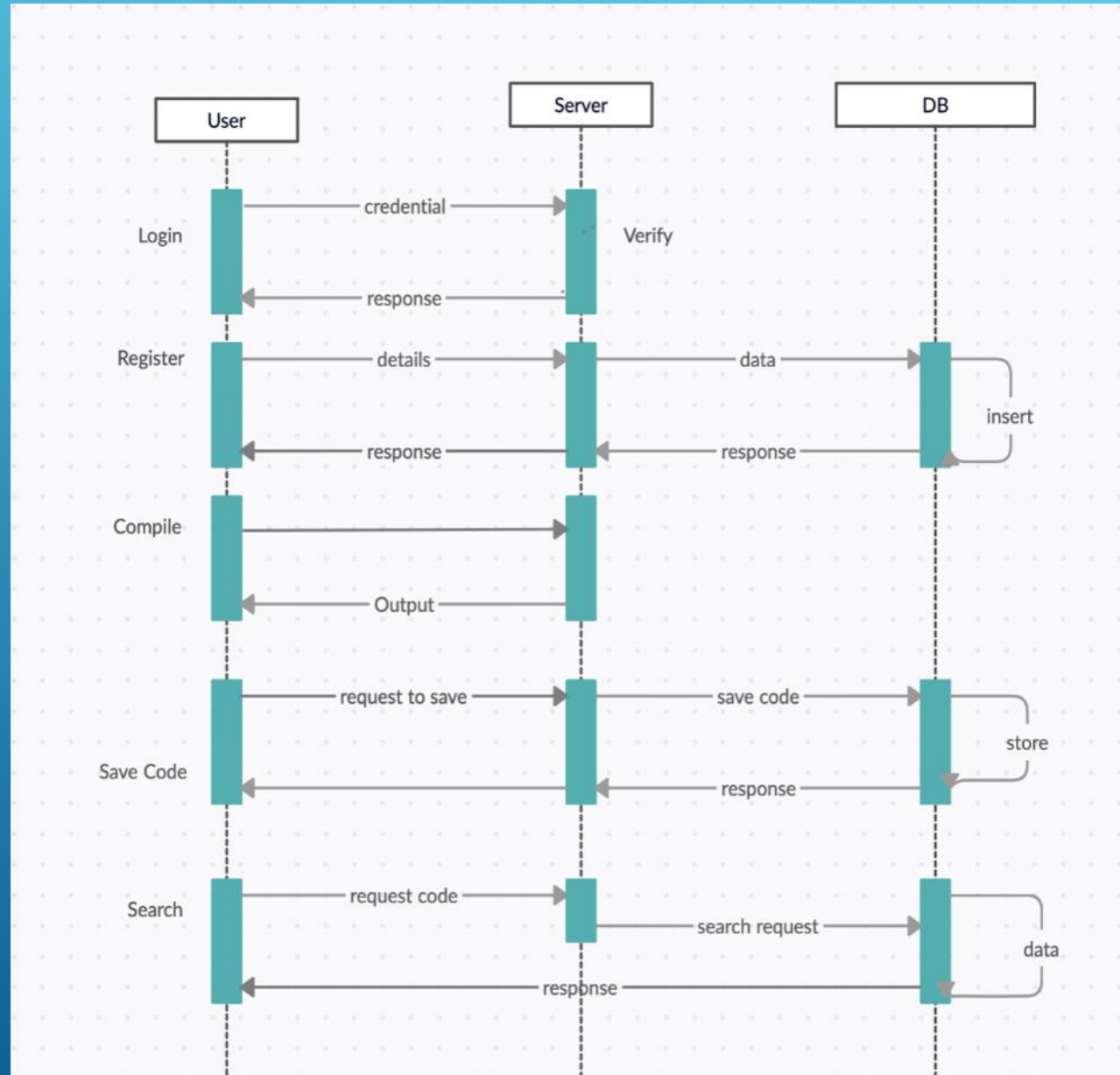


features without any advanced tools.
MVP is a prototype that includes the core

SYSTEM ARCHITECTURE



SEQUENCE DIAGRAM



PRODUCT BACKLOG

ID	Features	As a	I want to	So that	Priority
1	User Registration	User	Enter login details that is the first and last name, e-mail and password.	I can create my profile and register myself on the cloud computing service.	High
2	Login	User	Enter registered e-mail and password.	I can authenticate my account and after that I can retrieve previously stored source code.	High
3	Compilers for C, C++, C#, Java and Python	User	Select any of the compilers from the drop-down menu.	I can compile the code in any of the programming languages.	Moderate
4	Compile the code	User	Write or paste the source code in the "Enter your code" text area and compile it by clicking on the "Run" button.	I can compile and test my source code.	High
5	Save the Code	User	Save the code by clicking on the "Save" button.	So that I can store my source code and view it whenever I login using my credentials.	Moderate

ACCEPTANCE CRITERIA

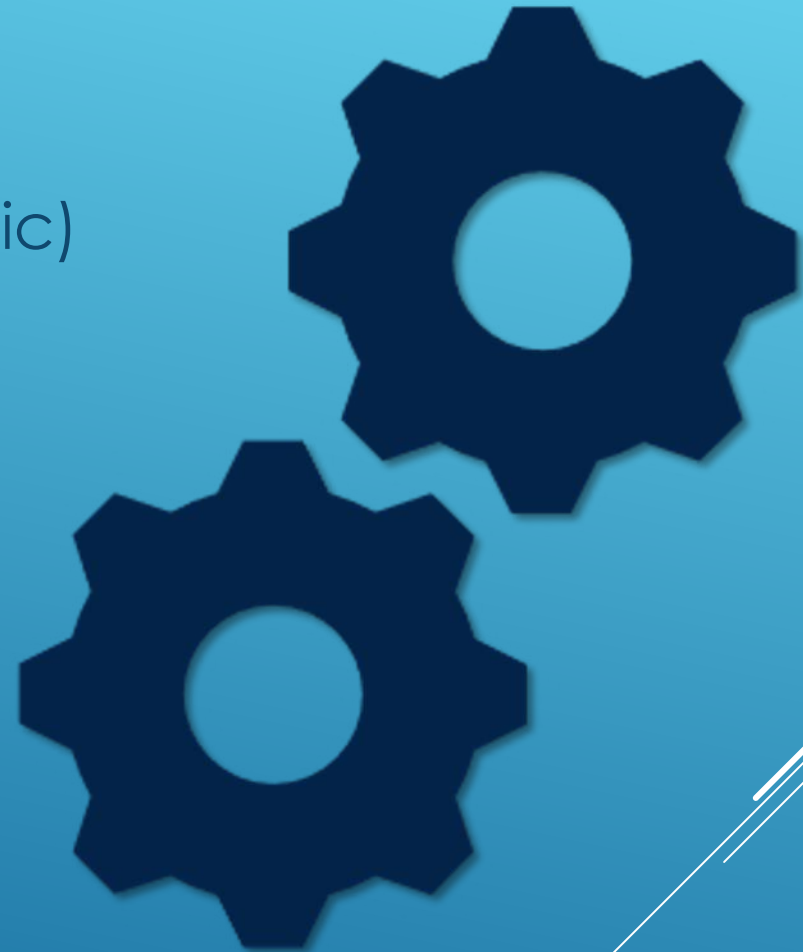
ID	Features	As a	Acceptance Criteria
1	User Registration	User	<ol style="list-style-type: none">1. Display Website.2. Display Register or sign in option.3. A user cannot register without completing all mandatory fields.4. Information from the form is stored in the registration database.5. Existing user cannot register again.6. Commencement and maintaining the session while logged in.7. Triggers session termination.
2	Login	User	<ol style="list-style-type: none">1. Login with username/e-mail.2. Enter password.3. Forgot username/password.
3	Compilers for C, C++, C#, Java and Python	User	<ol style="list-style-type: none">1. Display a drop-down menu of the programming languages.2. Display two text areas for entering the source code and for viewing output/error of the code.
4	Compile the code	User	<ol style="list-style-type: none">1. Display a run button.2. Programming language should be selected by user from the drop-down menu.3. There should be code written by the user in the "Enter your code" text area.
5	Save the Code	User	<ol style="list-style-type: none">1. The user must be registered and logged in in-order to use the save feature.2. Display "Save" button.3. The programming language should be selected and there should be a code written by the user in the source code area.

TEST CASES

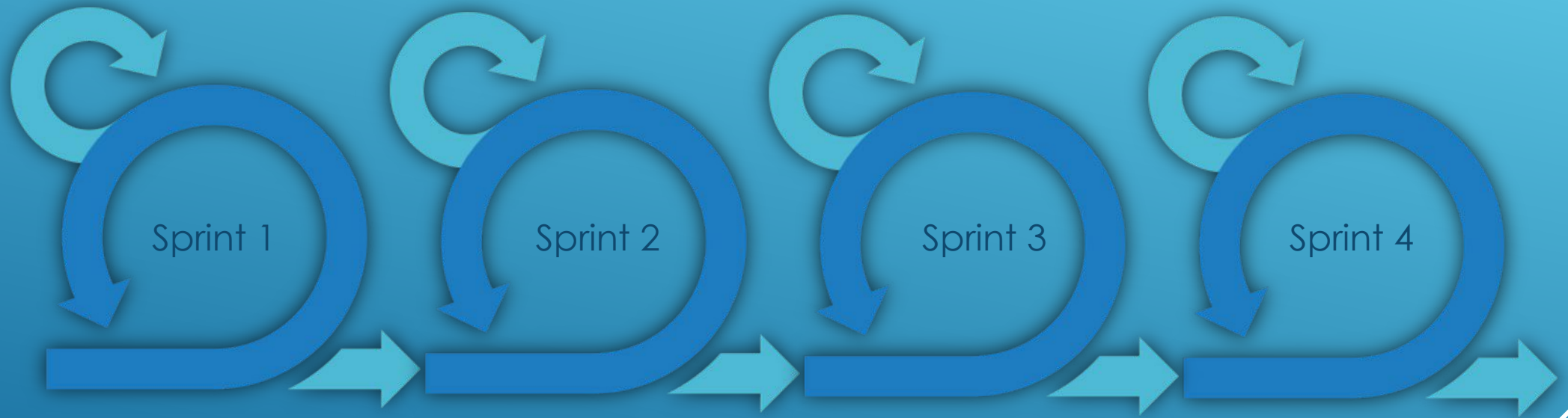
Test Cases for	Test Case ID	Test Scenario	Test Data	Expected Results	Actual Results	Pass/Fail
Registration	1	Check registration form with First name	Sanath	NO Validation Errors	NO Validation Errors	PASS
	2	Check registration form without first name	*Blank*	Validation Errors	Validation Errors	PASS
	2	Check registration form with Last name	Gholap	NO Validation Errors	NO Validation Errors	PASS
	4	Check registration form without Last name	*Blank*	Validation Errors	Validation Errors	PASS
	5	Check registration form with valid email	<u>sanath2097@gmail.com</u>	NO Validation Errors	NO Validation Errors	PASS
	6	Check registration form without email	*Blank*	Validation Errors	Validation Errors	PASS
	7	Check registration form with Password	testpassword	NO Validation Errors	NO Validation Errors	PASS
	8	Check registration form without Password	*Blank*	Validation Errors	Validation Errors	PASS
	9	Check registration form with invalid email	sanathgholap.com	Validation Errors	Validation Errors	PASS
	10	Check registration form with confirming Password	*Wrong password in confirm field*	NO Validation Errors	NO Validation Errors	PASS
Login	11	Check Login page with Password	testpassword	NO Validation Errors	NO Validation Errors	PASS
	12	Check Login page without Password	*Blank*	Validation Errors	Validation Errors	PASS
	13	Registration with pre-registered e-mail ID	<u>sanath2097@gmail.com</u>	User Already Exists Error	User Already Exists Error	PASS
Compile	14	Choosing the language from the drop-down menu with selecting a language	Java/Python/C/C++/C#	NO Validation Errors	NO Validation Errors	PASS
	15	Choosing the language from the drop-down menu without selecting a language	*Blank*	Validation Errors	Validation Errors	PASS
	16	Enter source code in the text area with entering text	Any code	NO Validation Errors	NO Validation Errors	PASS
	17	Enter source code in the text area without entering text	*Blank*	Validation Errors	Validation Errors	PASS
Save	18	Check if the source code text area contains code with actual code	Any code	NO Validation Errors	NO Validation Errors	PASS
	19	Check if the source code text area contains code without actual code	*Blank*	Validation Errors	Validation Errors	PASS

TECHNOLOGIES USED

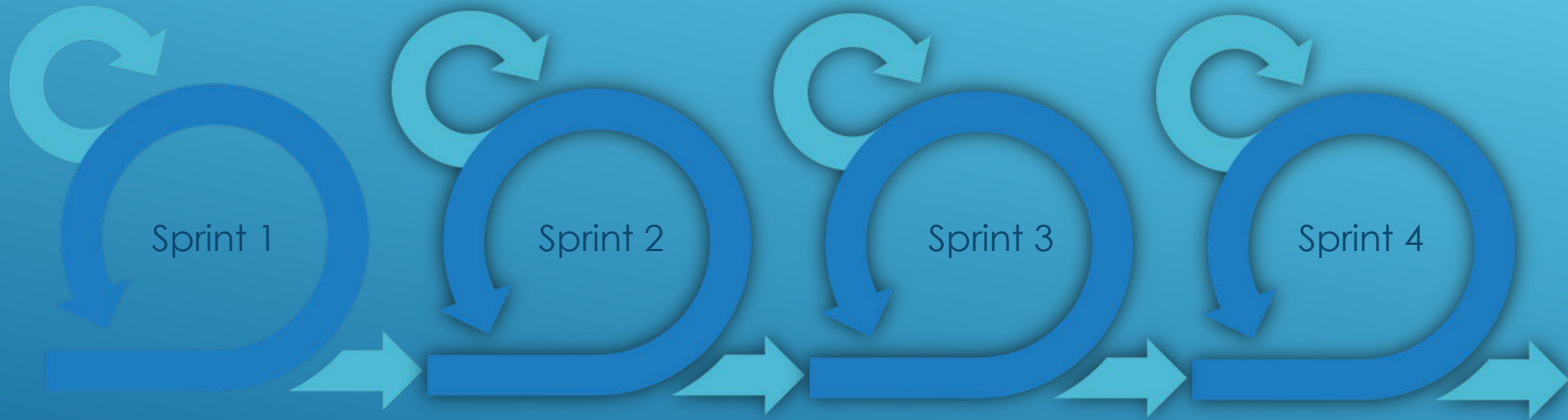
1. Google Cloud Platform
2. Python(Flask) (Middleware Business Logic)
3. HTML/CSS (Front-end)
4. MongoDB (Database)



SPRINTS



SPRINT 1



- Researched about the technologies that can be related to the project
- Decided on who will work on which module.

SPRINT BACKLOG

Sprint Task	Module	Priority	Issues Encountered	Start Date	End Date	Status
Sprint 1 : Task 1	Database	High	We cannot use structured database	09/04/2020	09/18/2020	Completed
Sprint 1 : Task 2	Cloud Service	High	Decision of selecting the cloud and storage service depending upon the cost and usage.	09/07/2020		In-Progress

RETROSPECTIVE SPRINT 1

What went well +

Formed a group and researched on project topics.

+ 0

Routinely meetings and discussed about the tasks where each member could be comfortable working on.

+ 0

made sprint plan 1 and following up with every members on tasks.

+ 0

was able to successfully assigned each tasks to each members.

+ 0

What needs improvement +

Decision on what project tools and technologies to be used.

+ 0

Needs to improve time management in execution of tasks assigned for sprint plan 1.

+ 0

Pending decision on Database (MySQL or MongoDB).

+ 0

Unclear about cloud requirements whether to use AWS or Azure and its charges according to the duration.

+ 0

Next Steps +

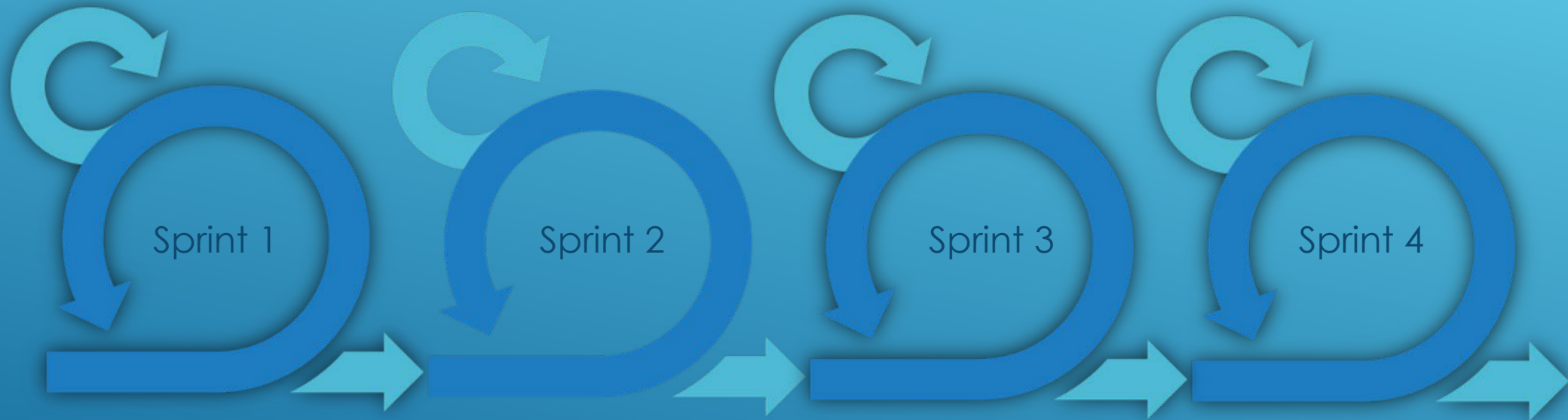
Learn and apply the tools and technology that are going to be used in front-end and back-end.

+ 0

Going to spend more time on learning back-end and hosting technologies.

+ 0

SPRINT 2



- Selection and learning about web application technology.
- Learning about compatibility of database.
- Started initial development of web application.

SPRINT BACKLOG

Sprint Task	Module	Priority	Issues Encountered	Start Date	End Date	Status
Sprint 2 : Task 1	Web Application	Medium	Selecting the layout of the front-end	09/23/2020	10/02/2020	Completed

RETROSPECTIVE SPRINT 2

What went well +

Conducted meetings routinely and discussed about the tasks where each member could be comfortable working on.

+ 0

was able to successfully assigned each tasks to each members.

+ 0

made sprint plan 2 and following up with every members on tasks.

+ 0

was able to identify the hands-on experience on technology that are going to be used in front-end and back-end and database of the project.

+ 0

What needs improvement +

Unclear about cloud requirements whether to use AWS or Azure and its charges according to the duration.

+ 0

Needs to improve time management in execution of tasks assigned for back-end services.

+ 0

Still Researching and deciding on database(Mysql or MongoDB).

+ 0

Next Steps +

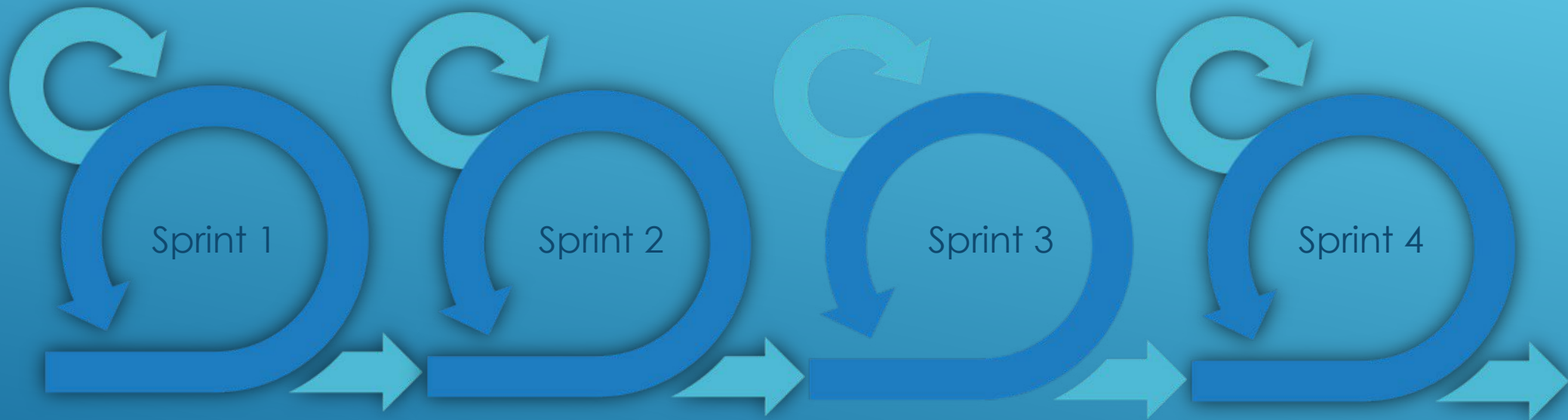
Going to change the dynamics of the current schedule.

+ 0

Going to spend more time on learning back-end and hosting technologies.

+ 0

SPRINT 3



- Researched and experimented on subprocess module of Python for compiler.
- Developed the frontend for compiler module.
- Developed the module for saving the source code.

SPRINT BACKLOG

Sprint Task	Module	Priority	Issues Encountered	Start Date	End Date	Status
Sprint 3 : Task 1	Compiler	High	Cannot take string as an argument for execution.	10/06/2020		In-Progress
Sprint 3 : Task 2	Compiler	High	Source code cannot take any input.	10/06/2020		In-Progress
Sprint 3 : Task 3	Save	Low	Connection between database and web application has not been established.	10/15/2020		In-Progress

RETROSPECTIVE SPRINT 3

What went well +

Collaboration with team members, Delegation of technical paper topics to each members and completed it successfully.

+ 0

Decided about which database to be used, and finally got to know by researching on our data type, MongoDB will be suitable for our database.

+ 0

Discussion on creating Login and Registration page, and its Authentication. Also, discussed planning on storing user's credentials on database.

+ 0

The decision on using tools and technologies on the front-end and back-end.

+ 0

What needs improvement +

Our planning for deciding on cloud is still going on and will start working on it next semester.

+ 0

Learning Flask and how to connect our web application using flask.

+ 0

Next Steps +

We will be Working on database queries to keep record of login credentials of users.

+ 0

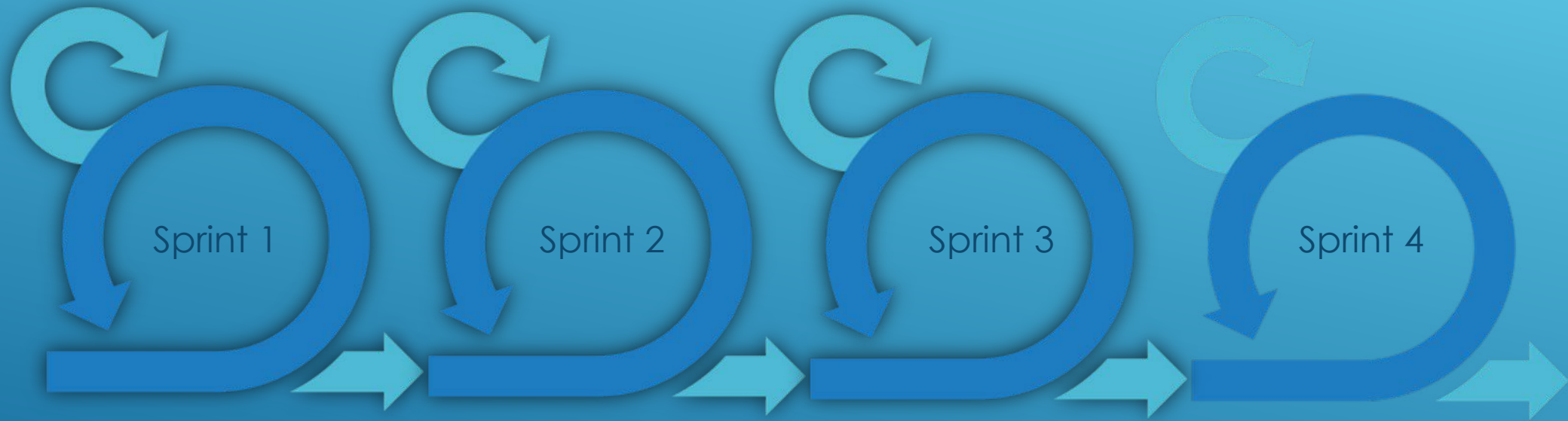
Will be researching and working on the back-end such as compilers.

+ 0

Creation of Web Application with all the supported features.

+ 0

SPRINT 4



- Developed the registration and login module with authentication.
- Created tables in MongoDB for registration and login.
- Created Integrated APIs for web application.

SPRINT BACKLOG

Sprint Task	Module	Priority	Issues Encountered	Start Date	End Date	Status
Sprint 4 : Task 1	API	Medium	Update of Rest API is not working.	10/28/2020		In-Progress
Sprint 4 : Task 2	Database	Medium	Aggregation of user table is not working.	10/30/2020	11/15/2020	Completed
Sprint 4 : Task 3	Login and Database	High	Not able to store user information in session for further functioning of application	11/02/2020	11/20/2020	Completed
Sprint 4 : Task 4	Registration	High	Cannot encode the password using secret key in Python	11/09/2020	11/16/2020	Completed

RETROSPECTIVE SPRINT 4

What went well +

Sync up with team members, tasks division to each member, and documentations and uploading process on the wiki page.

+ 0

Creation of Web pages such as UI and integrated API with front-end to the back-end including database for communication.

+ 0

Combined web app to database and able to store registration and login credentials to the database.

+ 0

Successfully learned and applied Flask development for our web application.

+ 0

Learned and applied required join queries to the database for registration and login page, and saving other data.

+ 0

+ 0

saving other data: registration and login page, and join queries to the database for

What needs improvement +

Our planning for deciding on cloud according to its availability is still going on and will start working on it next semester.

+ 0

Deciding about the overall final design of web application.

+ 0

Still working on saving users' source code and merging compilers so that users can edit and update their source code during compilation.

+ 0

Next Steps +

Will be working on cloud computing for our web application in the next semester and connecting our application to it.

+ 0

Formatting the output and the error message.

+ 0

Taking arguments for the source code.

+ 0

We will try to test the compile module if it is working properly with the flask. Also we will make sure if the input entered by the user will be processed as a whole string.

+ 0

SCRUM MEETINGS

The format of our daily scrum meetings consist of 3 main points :

- What did you do yesterday?
- What is the plan for today?
- How close we are to reaching our sprint objectives?



FUTURE SCOPE

- We can add a discussion area where registered users can help each other with their difficulties in the code.
- We can update our web application to make it more user friendly.
- We can expand our application for compiling various other programming languages.
- Implement strict privacy for user's data safety.



GITHUB LINK

□ <https://github.com/sg99356n/OnlineCC/wiki/Online-Compiler-Using-Cloud-Computing>



THANK YOU!

