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Distance learning system, learning programming languages by using mobile applications

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Abstract

E-learning involves the use of a computer or electronic device (e.g., a mobile phone) in some way to provide training, educational or learning material. E-learning can involve a greater variety of equipment than online training or education, for as the name implies, 'online' involves using the Internet or an Intranet. CD-ROM and DVD can be used to provide learning materials. Distance education provided the base for e-learning's development. E-learning can be 'on demand'. It overcomes timing, attendance and travel difficulties. Today, colleges and university students find themselves with obligations beyond that of getting a degree. Jobs and family commitments make equal demands on their time. Having the option of taking online classes and studying on their own time is critically important. At the same time, many state institutions are unable to accommodate all those who want to take classes on campus, escalating the demand for online learning. The aim of this project is the development of learning management system for all purpose and all courses. You can be as a teacher and upload your course materials to all students in our e-learning system, you can write an article to all students and teachers also. With our e-learning system you are online every time, you can get messages from all students and teacher, without e-mail, just by your username in our system. If you are a student, our e-learning system will be your school. You can study any course that is available. You can make a discussion with another student and your teacher by using comments, you can compile your code and share the result with others by social media links. You can upload any file like quizzes answers and share the link in comment with other students. This system provides you with knowledge about our e-learning system and which tools that we used. The online courses may be unfamiliar to many students and teachers;threfore,this system may be help you to try a new teaching technology with learning management system.In this e-system, we have mentioned about Teacher and student features, these features will make you more attractive to go on and create your courses and start

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teaching your student, or to join other teacher classes and start learning, this e-system will help you to understand how we make the e-learning system by messages or comments, also how you can compile your code with built-in online compiler. Finally, lifelong learning must now be a part of everyone's career plans. In today's job market, taking online courses help workers remain competitive and they don't need to take time off from their jobs to do this. Therefore, our e-learning system provide all facilities to taking online course and be in your community to learn without boring.

Keywords: Online learning, digital ocean, android studio, Paiza. IO, mobile app.

1. Background

The delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g., a mobile phone) in some way to provide training, educational or learning material. E-learning can involve a greater variety of equipment than online training or education, for as the name implies, 'online' involves using the Internet or an Intranet. CD-ROM and DVD can be used to provide learning materials. Distance education provided the base for e-learning's development. E-learning can be 'on demand'. It overcomes timing, attendance and travel difficulties.

One of the most longstanding debates in the field of education has been whether or not we can benefit from e-learning to actually learn. Do we, as human beings, have the ability to soak up information in this fashion, and can we truly learn new skills and expand our knowledge by learning virtually? We realise the reservations of people who will argue that computers promote procrastination and offer distractions; however, we owe it to ourselves to dig a little deeper and see the other side of the coin that pinpoints the unique advantages of learning online. It's true that as individuals we don't all respond to one teaching method in the same way –some learn visually, and others learn with repetition or writing; some prefer (Tan, Naraharisetti, Chin & Lee, 2020)to learn by themselves, whereas others need someone to guide them all along the way; some are extroverts and feel comfortable talking in front of people, whilst others are introverts and are afraid to communicate openly inside the classroom. E-learning responds to those different needs with the use of different tools and a variety of materials. For example, e-learning commonly offers audiovisual content or interactive testing on the go that can be more attractive for younger learners than traditional books. E-learning also lets people communicate through email, forum or chat, allowing even introverts to take part in related conversations. E-Learning, in comparison with traditional learning, significantly reduces the time needed to locate the information. It also offers access to online resources, databases, periodicals, journals and other material you wouldn't normally have access to from a library. If a student has trouble understanding the part of the coursework.

Finding tips on the matter couldn't be easier than having immediate access to supplementary, unlimited and mostly free material online! Those characteristics can potentially maximise the time spent actually learning rather than looking for information (Towell, 2020)(note however that seeking information can be a learning process in and of itself! – the word serendipity describes exactly that, the accident of finding something good or useful even when not specifically searching for it).

Long before the internet was launched, distance courses were being offered to provide students with education on particular subjects or skills. In the 1840s Isaac Pitman taught his pupils shorthand via correspondence. This form of symbolic writing was designed to improve writing speed and was popular amongst secretaries, journalists and other individuals who did a great deal of note taking or writing. Pitman, who was a qualified teacher, was sent completed assignments by mail and he would then send his students more work to be finished using the same system.

In 1924, the first testing machine was invented. This device allowed students to tests themselves. Then, in 1954, BF Skinner, a Harvard Professor, invented the 'teaching machine', which enabled schools to administer programmed instruction to their students. It wasn't until 1960, however, that the first computer-based training program was introduced to the world. This computer-based training

program (or CBT program) was known as Programmed Logic for Automated Teaching Operations. It was originally designed for students attending the University of Illinois, but ended up being used in schools throughout the area.

The first online learning systems were really only set up to deliver information to students but as we entered the 70s online learning started to become more interactive. In Britain, the Open University was keen to take advantage of e-learning. Their system of education has always been primarily focused on learning at a distance. In the past, course materials were delivered by post and correspondence with tutors was via mail. With the internet, the Open University began to offer a wider range of interactive educational experiences as well as faster correspondence with students via email etc.

2. Propose

Whether you're a high-school teacher or college looking to engage your students in a more interactive way, or a corporate trainer hired by a large company to design training (Kumar, Zindani & Davim, 2020)curricula, e-learning packs a punch when it comes to benefits that make the creation and delivery processes easier and hassle-free. Important benefits are outlined in the following paragraphs:

2.1. No boundaries, no restrictions

Along with location restrictions, time is one of the issues that learners and teachers both have to face in learning. In the case of face-to-face learning, the location limits attendance to a group of learners who have the ability to participate in the area, and in the case of time, it limits the crowd to those who can attend at a specific time. E-learning, on the other hand, facilitates learning without having to organise when and where everyone who is interested in a course can be present.

2.2. More fun

Designing a course in a way that makes it interactive and fun through the use of multimedia or the more recently developed methods enhances not only your engagement factor, but also the relative lifetime of the course material in question.

2.3. Cost effective

This is directed to both learners and teachers, but there is a good chance that whatever your role you had to pay exorbitant amounts of money at some point to acquire updated versions of textbooks for school or college. While textbooks often become obsolete after a certain period of time, the need to constantly acquire new editions is not present in e-learning.

3. Advantages of e-learning

3.1. Web-based learning at a glance

Web-based learning is commonly referred to as eLearning or online learning. It essentially includes learning online through the courses that are offered on the net. Emails, live lectures, and videoconferencing are all possible through the net. This enables all the participants to give their views on a particular topic and then discuss them further. They also offer static pages like course materials that are printed for the benefit of all the participants. One of the main advantages of accessing pages on the web is that most of the web pages have hyperlinks that will lead you to another page and thus opens up a vast amount of information on the net.

You don't have the time to actually go to a University and attend classes. Earlier it would have been a major problem, as you wouldn't know how to manage that, but not anymore. With the several courses available online, you can actually sit at home and learn. No more of waking up early and attending classes or that irritating class mate. Now take whichever course at peace and at your convenience. A web-based course would typically include course information, timetable, notice board, curriculum map, teaching materials, such as articles, slides, and handouts, communication through discussion boards and email, summative and formative assessments, student management tools like statistics, records, and student tracking and also links to external and internal websites that are very useful.

3.2. Online learning accommodates everyone's needs

The online method of learning is best suited for everyone. This digital revolution has led to remarkable changes in how the content is accessed, consumed, discussed and shared. Online educational courses can be taken up by office goers and housewives too, at the time that suits them. Depending on their availability and comfort, many people choose to learn at weekends or evenings

3.3. Lectures can be taken any number of times

Unlike classroom teaching, with online learning you can access the content an unlimited number of times. This is, especially, required at the time of revision when preparing for an exam. In traditional form of learning, if you cannot attend the lecture, then you have to prepare for that topic on your own; in eLearning, you can attend the lectures whenever you want with ease.

3.4. Offers access to updated content

A prime benefit of learning online is that it makes sure that you are in synchronisation with modern learners. This enables the learner to access updated content whenever they want it.

3.5. Quick delivery of lessons

eLearning is a way to provide quick delivery of lessons. As compared to traditional classroom teaching method, this mode has relatively quick delivery cycles. This indicates that the time required to learn is reduced to 25%–60% of what is required in traditional learning. There are some of the reasons why the learning time is reduced by eLearning: Lessons starts quickly and also wrapped up in a single learning session. This enables training programs to easily roll out within a few weeks or sometime even days. Learners can define their own speed of learning instead of following the speed of the whole group. Saves time as a student does not need to travel to the training venue. You can learn at the comfort of your own place. Students can choose to study specific and relevant areas of the learning material without focusing on each and every area. For example, they can skip certain areas they do not want to learn.

3.6. Scalability

eLearning helps in creating and communicating new training, policies, concepts and ideas. Whether it is for formal education or entertainment, eLearning is very quick way of learning!

3.7. Consistency

eLearning enables educators to get a higher degree of coverage to communicate the message in a consistent way for their target audience. This ensures that all learners receive the same type of training with this learning mode.

3.8. Reduced costs

E-Learning is cost effective as compared to traditional forms of learning. The reason for this price reduction is because learning through this mode happens quickly and easily. A lot of training time is reduced with respect to trainers, travel, course materials and accommodation.

This cost effectiveness also helps in enhancing the profitability of an organisation. Also, when you are studying at your own place, you are relieved from paying for travel expenses (e.g., accommodation) when training happens in another city/state and/or external learning materials.

3.9. Effectiveness

eLearning has a positive influence on an organisation's profitability. It makes it easy to grasp the content and digest it: It results in improved scores on certifications, tests or other types of evaluation. Higher number of students who achieve 'pass' or mastery' level. Enhanced ability to learn and implement the new processes or knowledge at the workplace. Help in retaining information for a longer time.

4. Advantages of online classes

4.1. Variety of programs and courses

From traditional 4-years universities to completely online career colleges, higher education today offers a variety of options for students. This means that no matter what students wish to study, from nursing to neuroscience, they can find online the courses or degree programs they need. They can also earn every academic degree online, all the way from a career certificate to a doctorate.

4.2. Lower total costs

Online programs can be a more affordable option than traditional colleges. Although not all online degrees have less expensive net tuition prices than traditional colleges (link to OEDB article the author wrote about college costs), associated costs are almost always less expensive. For example, there are no commuting costs, and sometimes there is also not any required course materials such as textbooks because those are often available for free online (Mladenovic, Mladenovic & Zanko, 2020). In addition, many colleges and universities have begun to accept credits earned via free massive open online courses, the most recent advance in online education. Free online courses such as these can help students fulfil general education requirements at little to no cost.

4.3. More comfortable learning environment

Commercials that featuring online students studying in the pajamas only skim the surface of one of the primary benefits of online education: there are no physical class sessions. Lectures and other materials are electronically sent to the student, who will then read them and complete assignments. Students will not have to fight traffic, find parking spaces and leave work early to go to class, or miss important family time.

4.4. Convenience and flexibility

Online courses give students the opportunity to plan their study time around the rest of their day, instead of the other way around. Students can study and work when they are at their peak energy, whether that's early morning or late at night. Course material is always accessible online, so there's no need to schedule special trips to a library either. All of this makes online learning a good option for students who need to balance their work and family commitments.

4.5. More interaction and greater ability to concentrate

While there is contradictory evidence about the rate of online student participation versus participation in traditional courses, one thing is certain: online courses offer shy or more reticent students the opportunity to participate in class discussions or chats with more ease than face-to-face class sessions. Some students even report that online courses are easier to concentrate in because they are not distracted by other students and classroom activity.

4.6. Career advancement

Students can take online courses and even complete entire degrees while working, while in-between jobs, or while taking time to raise a family. This academic work will explain any discontinuity or gaps in a resume as well. Also, earning a degree can show prospective employers that you are ambitious and want to remain informed and prepared for any new challenges.

4.7. Continue in your profession

Even if someone wants to complete a degree program, it does not mean that they want to leave their current job. For most students today, college costs mean that it is necessary to continue working while in school. The previously mentioned flexibility of online degree programs enables students to keep working while also pursuing academic credentials.

4.8. Avoid commuting

During snowstorms and thunderstorms, colleges may cancel classes; if they don't, you run the risk of getting hurt in dangerous driving conditions. Rather than miss important class sessions, students in online courses can always 'attend' by participating on discussion boards or in chat sessions, turn in their work on time, and watch lectures or read materials. Many students also find that the amount they save on fuel costs can be substantial if they don't have to commute to a physical campus in general, no matter what the weather conditions may be.

4.9. Improve your technical skills

Even the most basic online course requires the development of new computer skills, as students learn to navigate different learning management systems and programs. The skills students learn to participate in their online courses translate to many professions, including creating and sharing documents, incorporating audio/video materials into your assignments, completing online training sessions, etc.

4.10. Transfer credits

For college students who want to attend summer classes, but who live too far from their colleges or have to work summer jobs, taking online classes from an accredited college and transferring the

credits to their primary college is a good idea. Students will be able to earn college credit while still enjoying their summer vacation or fulfilling the responsibilities of their seasonal jobs. Similarly, if a college or university is unable to offer enough open sections of a required course, students can take the course online at another college and transfer the credits.

5. Programming language compiler used

5.1. What is paiza.IO?

Paiza.IO is online editor and compiler where you can write and run code instantly. Whenever you come up with new idea, learn or teach programming, you and others can just write and run code.

5.2. Paiza.IO engine

Paiza.IO engine is the lightest container-based code runner engine that support all (20+) popular compiler or script languages. Paiza.IO engine provides stable running time, extremely low latency without any polling and scalable infrastructure.

6. Mobile app

6.1. Mobile app overview

A mobile application software or mobile app is application software designed to run on mobile devices, such as smart phones and tablet computers. Mobile apps often stand in contrast to desktop applications that run on desktop computers and with web applications which run in mobile web browsers rather than directly on the mobile device. The term 'app' is a shortening of the term 'application software'. It has become very popular, and in 2010 it was listed as 'Word of the Year' by the American Dialect Society. In 2009, technology columnist David Pogue said that newer smart phones could be nicknamed 'app phones' to distinguish them from earlier less sophisticated smart phones. Most such devices are sold with several apps bundled as pre-installed software, such as a web browser, email client, calendar, mapping program, and an app for buying music or other media or more apps. Some pre-installed apps can be removed by an ordinary uninstall process, thus leaving more storage space for desired ones. Where the software does not allow this, some devices can be rooted to eliminate the undesired apps. Apps that are not preinstalled are usually available through distribution platforms called app stores. They began appearing in 2008 and are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store and BlackBerry App World. However, there are independent app stores, such as Cydia, GetJar and F-Droid. Some apps are free, while others must be bought. Usually, they are downloaded from the platform to a target device, but sometimes they can be downloaded to laptops or desktop computers. For apps with a price, generally a percentage, 20%–30%, goes to the distribution provider (such as iTunes), and the rest goes to the producer of the app. The same app can therefore cost a different price depending on the mobile platform. Apps can also be installed manually, for example, by running an Android application package on the Android devices. Mobile apps were originally offered for general productivity and information retrieval, including email, calendar, contacts, stock market and weather information. However, the public demand and the availability of developer tools drove rapid expansion into other categories, such as those handled by desktop application software packages. As with other software, the explosion in number and variety of apps made discovery a challenge, which in turn led to the creation of a wide range of review, recommendation, and curation sources, including blogs, magazines, and dedicated online app-discovery services.

In 2014, government regulatory agencies began trying to regulate and curate apps, particularly medical apps. Some companies offer apps as an alternative method to deliver content with certain

advantages over an official website. Usage of mobile apps has become increasingly prevalent across mobile phone users. A May 2012 com Score study reported that during the previous quarter, more mobile subscribers used apps than browsed the web on their devices: 51.1% versus 49.8% respectively. Researchers found that the usage of mobile apps strongly correlates with user context and depends on user's location and time of the day. Mobile apps are playing an ever-increasing role within healthcare and when designed and integrated correctly can yield many benefits. Market research firm Gartner predicted that 102 billion apps would be downloaded in 2013 (91% of them free), which would generate $26 billion in the US, up 44.4% on 2012s US$18 billion. By Q2 2015, the Google Play and Apple stores alone generated $5 billion. An analyst report estimates that the app economy creates revenues of more than €10 billion per year within the European Union, while over 529,000 jobs have been created in 28 EU states due to the growth of the app market.

6.2. Development

Developing apps for mobile devices requires considering the constraints and features of these devices. Mobile devices run on battery and have less powerful processors than personal computers and also have more features, such as location detection and cameras. Developers also have to consider a wide array of screen sizes, hardware specifications and configurations because of intense competition in mobile software and changes within each of the platforms (although these issues can be overcome with mobile device detection).

Mobile application development requires use of specialised integrated development environments. Mobile apps are first tested within the development environment using emulators and later subjected to field testing. Emulators provide an inexpensive way to test applications on mobile phones to which developers may not have physical access. [citation needed]

Mobile user interface (UI) Design is also essential. Mobile UI considers constraints and contexts, screen, input and mobility as outlines for the design. The user is often the focus of interaction with their device, and the interface entails components of both hardware and software. User input allows for the users to manipulate a system, and device's output allows the system to indicate the effects of the users' manipulation. Mobile UI design constraints include limited attention and form factors, such as a mobile device's screen size for a user's hand. Mobile UI contexts signal cues from user activity, such as location and scheduling that can be shown from user interactions within a mobile application. Overall, mobile UI design's goal is primarily for an understandable, user-friendly interface. Mobile UIs, or front-ends, rely on mobile back-ends to support access to enterprise systems. The mobile back-end facilitates data routing, security, authentication, authorisation, working off-line and service orchestration. This functionality is supported by a mix of middleware components including mobile app servers, Mobile Backend as a service, and SOA infrastructure. Conversational interfaces display the computer interface and present interactions through text instead of graphic elements. They emulate conversations with real humans. There are two main types of conversational interfaces: voice assistants (like the Amazon Echo) and chat bots. Conversational interfaces are growing particularly practical as users are starting to feel overwhelmed with mobile apps (a term known as 'app fatigue'). David Limp, Amazon's senior vice president of devices, says in an interview with Bloomberg, 'We believe the next big platform is voice.

6.3. Google play

Google Play (formerly known as the Android Market) is an international online software store developed by Google for Android devices. It opened in October 2008. In July 2013, the number of apps downloaded via the Google Play Store surpassed 50 billion, of the over 1 million apps available. As of September 2016, according to Statista, the number of apps available exceeded 2.4 million. The store generated a revenue of 6 billion U.S. dollars in 2015.

6.4. Enterprise management

Mobile application management (MAM) describes software and services responsible for provisioning and controlling access to internally develop and commercially available mobile apps used in business settings. The strategy is meant to off-set the security risk of a Bring Your Own Device (BYOD) work strategy. When an employee brings a personal device into an enterprise setting, MAM enables the corporate IT staff to transfer required applications, control access to business data and remove locally cached business data from the device if it is lost, or when its owner no longer works with the company. Containerisation is an alternate BYOD security solution. Rather than controlling an employee's entire device, containerisation apps create isolated and secure pockets separate from all personal data. Company control of the device only extends to that separate container.

6.5. App wrapping versus native app management

Especially, when employees 'bring your own device', mobile apps can be a significant security risk for businesses because they transfer unprotected sensitive data to the Internet without knowledge and consent of the users. Reports of stolen corporate data show how quickly corporate and personal data can fall into the wrong hands. Data theft is not just the loss of confidential information, but makes companies vulnerable to attack and blackmail. Professional MAM helps companies protect their data. One option for securing corporate data is app wrapping. But there also are some disadvantages like copyright infringement or the loss of warranty rights. Functionality, productivity and user experience are particularly limited under app wrapping. The policies of a wrapped app cannot be changed. If required, it must be recreated from scratch, adding cost. Alternatively, it is possible to offer native apps securely through enterprise mobility management without limiting the native user experience. This enables more flexible IT management as apps can be easily implemented and policies adjusted at any time

7. Project overview

The initial main idea of the program is to make an application that the students can do their programming assignments on their phones instead of PCs or laptops, also, the student can join to a programming classroom that has been made by their lecturer.

Therefore, the application has two type of users which are students and lecturers of the teachers.

Let's talking of what student can do:

1. Register as a student account
2. Join to a classroom
3. Learn some basic information about the programming (i.e. codes, syntax, and more)
4. Write codes on the built-in compiler and test it
5. Send the code that he has made it to his lecturer
6. Start a live chat with his lecturer
7. And more on.

What teacher can do?

1. Register as a teacher (lecturer) account
2. Create classrooms
3. Give his students assignment to do
4. Also, he can Write his own code on the built-in compiler and see the result
5. Receive and check his student's assignments and make notes
6. Start a live chat with his student

Now let's describe the steps of the program

These pictures will explain the steps of the program for every type of user.

8. Student perspective

HOME PAGE

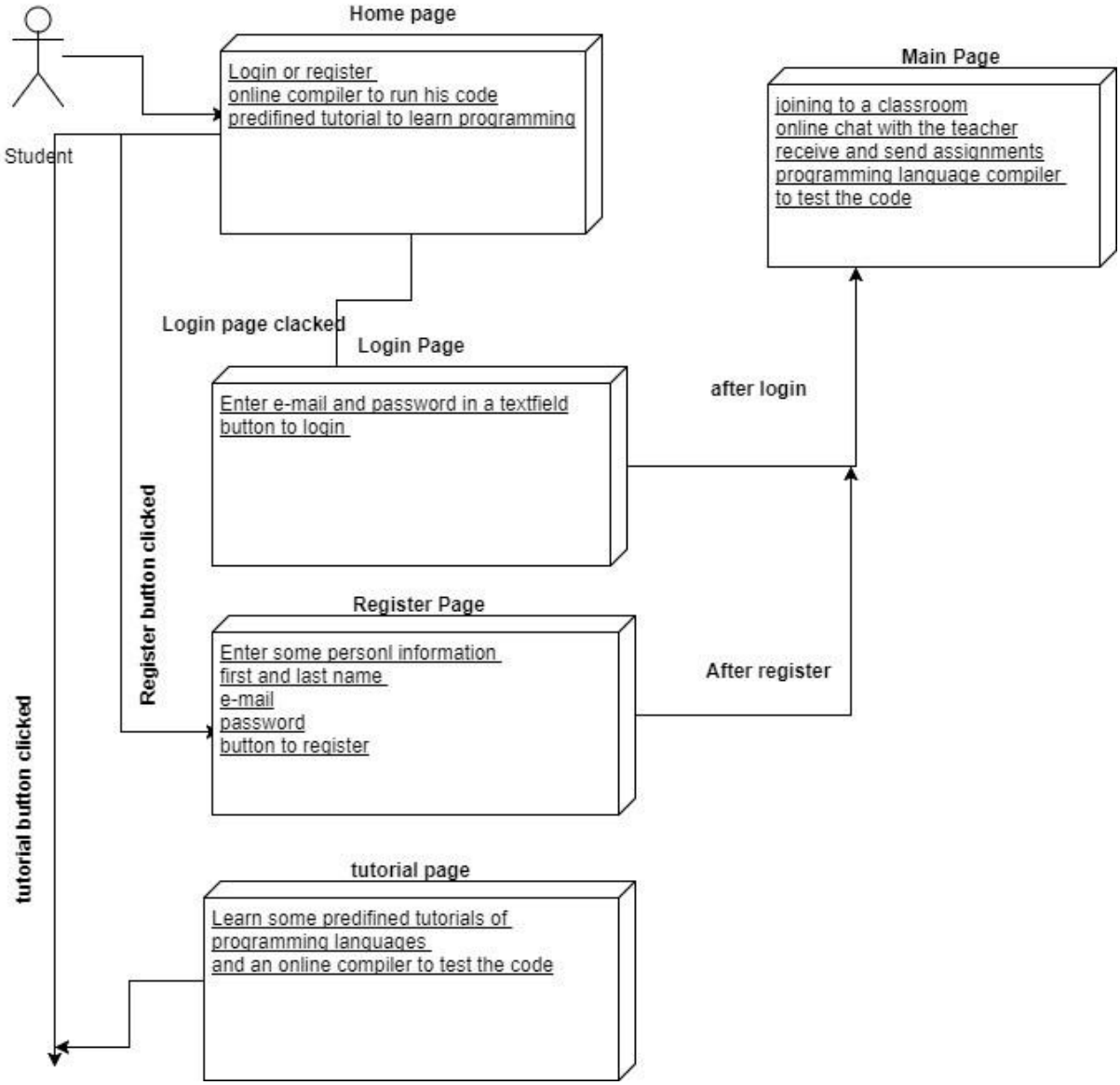


Figure 1. Student perspective

MAIN PAGE

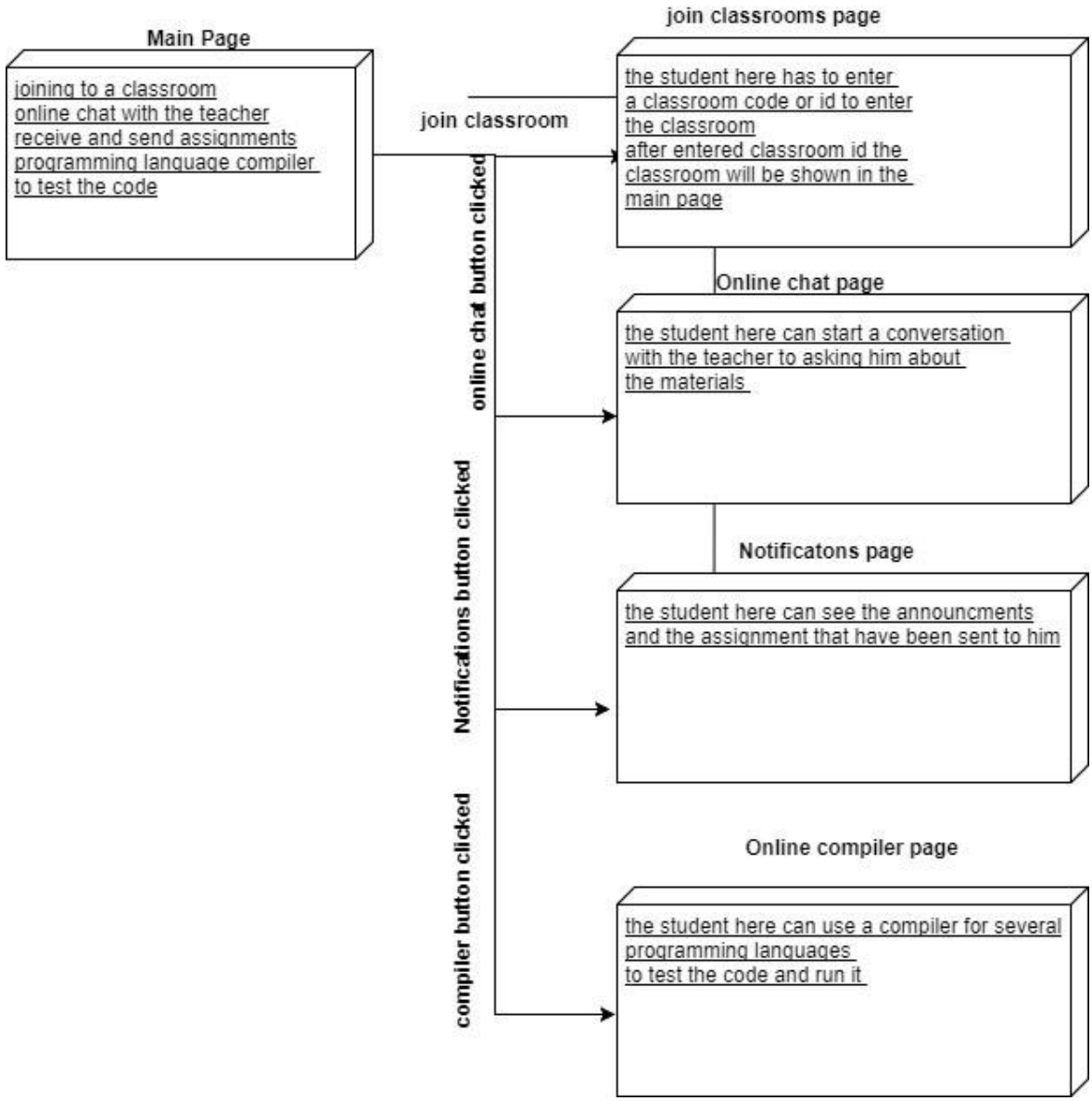


Figure 2. Main page

8.1. Teacher perspective

There is no difference in the teacher perspective of Home Page the real difference is at Main Page as shown below.

HOME PAGE

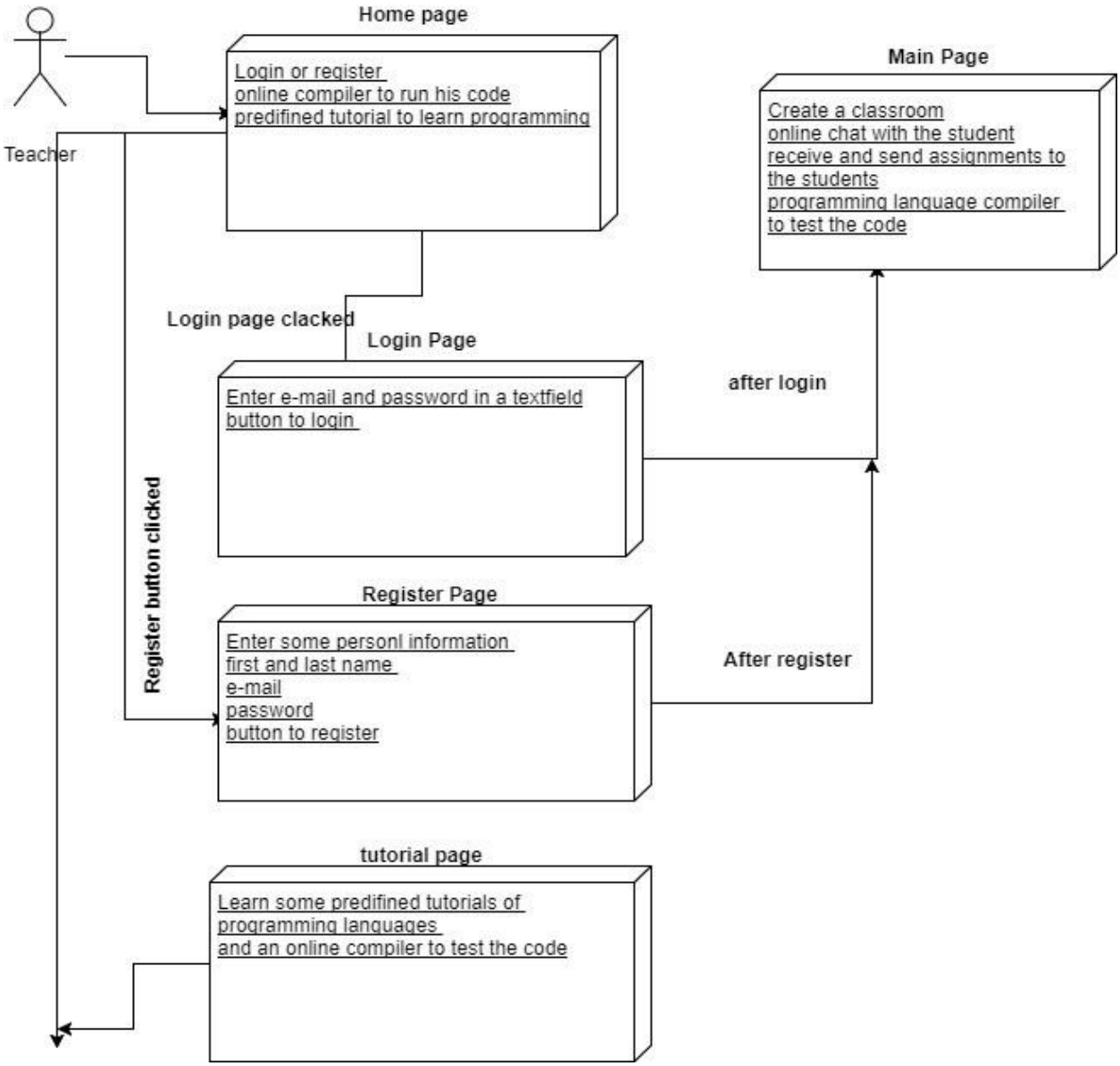


Figure 3. Teacher perspective

Main Page

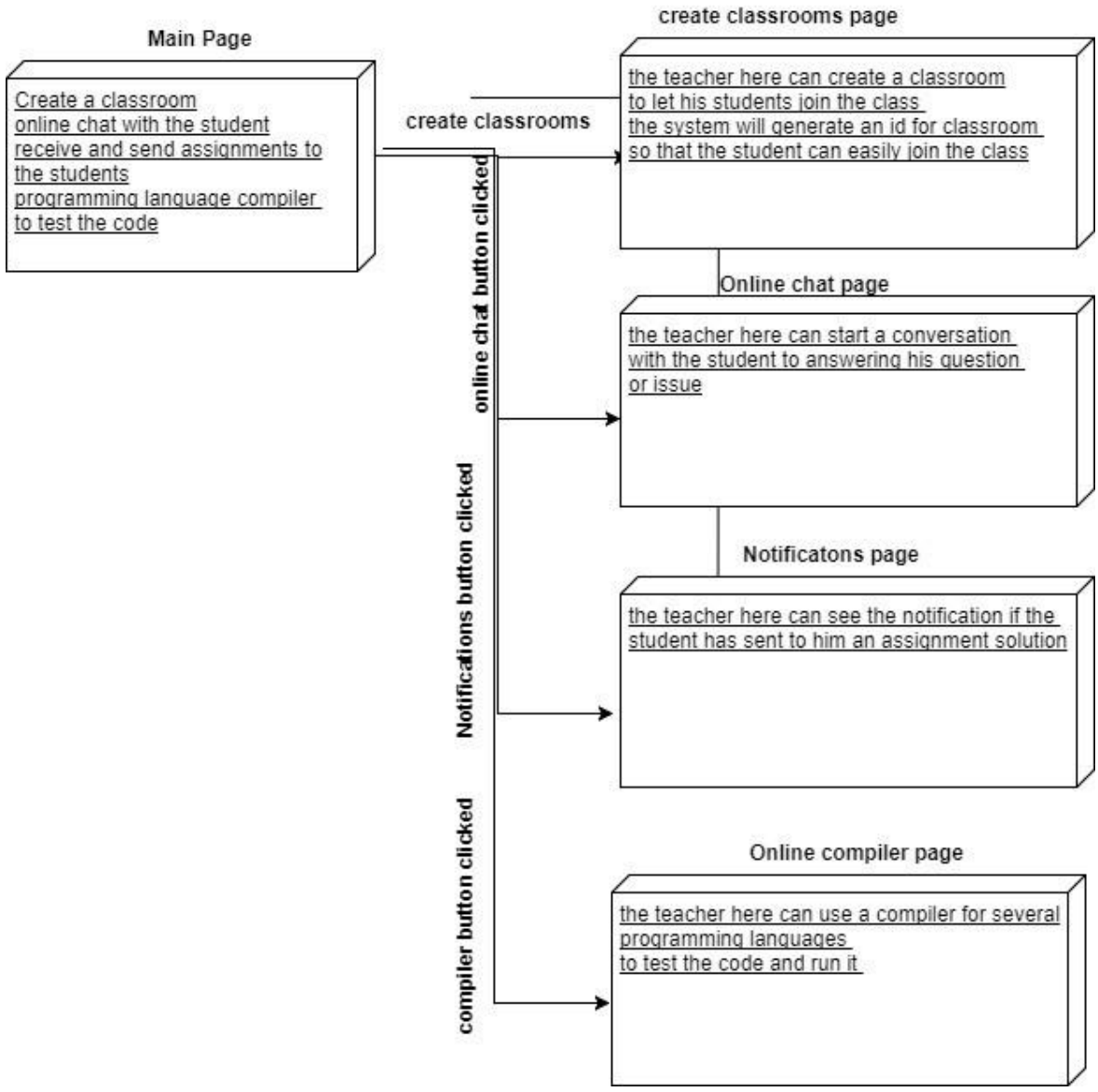


Figure 4. Main page

9. Project development

9.1. Setup the server

The first phase of this project was to launch an Ubuntu instance on a DigitalOcean Droplet

there are two ways to create a Droplet. You can either:

- Click the large, blue **Create Droplet** button. This button is only visible when you do not have any Droplets.
- Click the green **Create** button in the top right and choose **Droplets**.

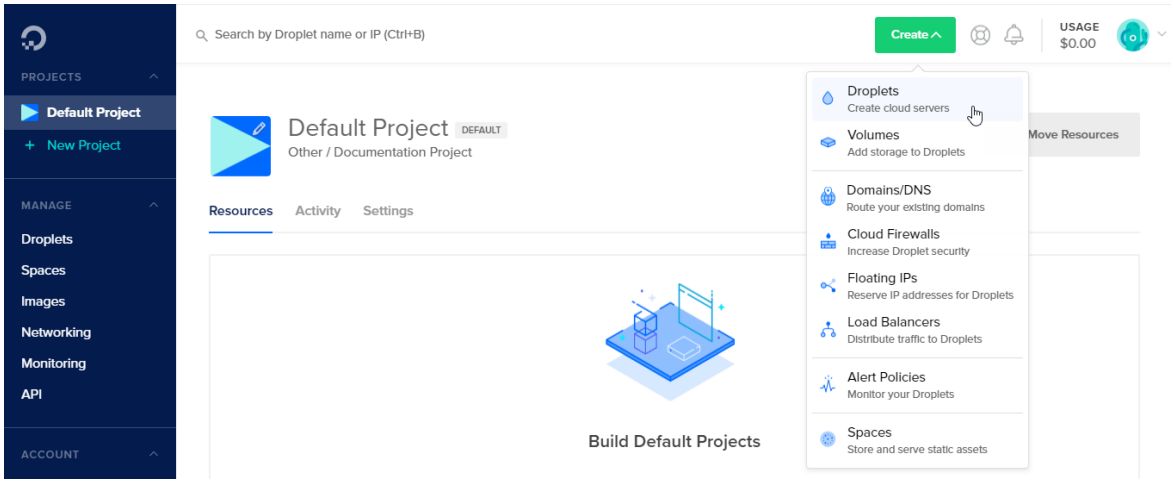
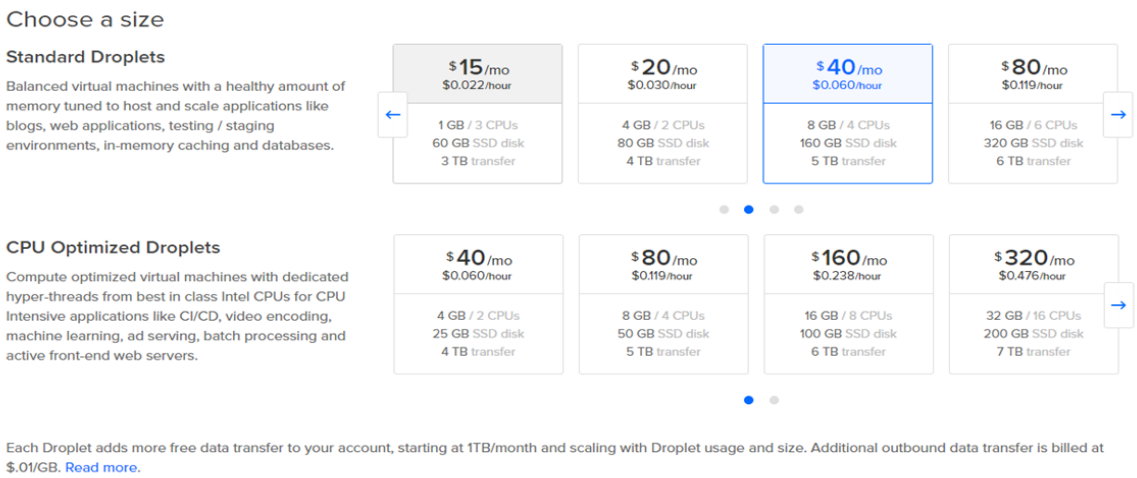


Figure 5. Setup the server

Whichever link you use, you'll be taken to the Create Droplet page. This page lets you specify configuration options for your Droplet, like how much memory it has and which features (like backups) are enabled.

9.2. Choose a size

The next configuration section allows you to choose the size of your Droplet, i.e. the amount of RAM and storage space it has.



There are two types of plans:

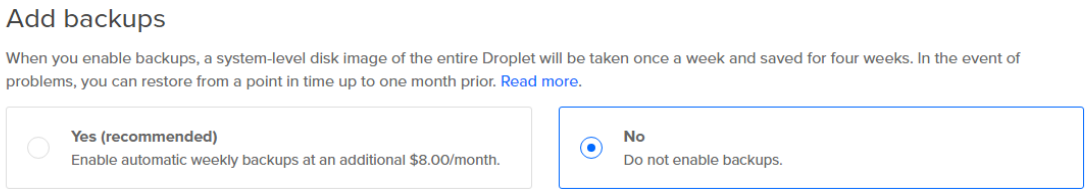
- **Standard Droplets**, a flexible option best for most use cases, like website hosting, staging environments and low intensity compute needs.
- **CPU Optimized Droplets**, best for CPU intensive tasks and projects that require predictable performance or rely on CPU more than RAM or I/O, like batch processing large data sets, large builds, and video encoding.

If your Droplet will have less than 3 GB of RAM, and especially if it will have less than 1 GB, we recommend using a 32-bit operating system. This is because processes can require significantly more memory on a 64-bit architecture. On servers with a limited amount of RAM, any performance benefits

that might be gained from a 64-bit architecture would be offset by having less memory available for buffers and caching.

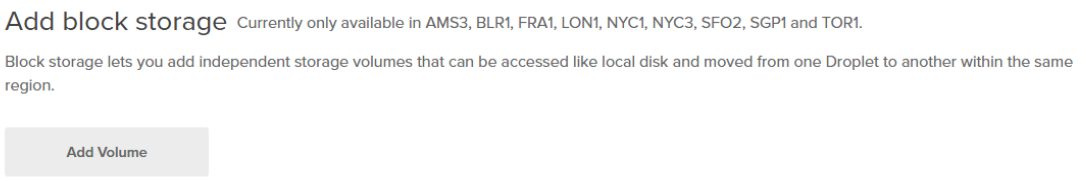
Add backups

Backups enable automatic weekly backups of the Droplet and cost about 20% of the monthly price of the Droplet.



9.3. Add block storage

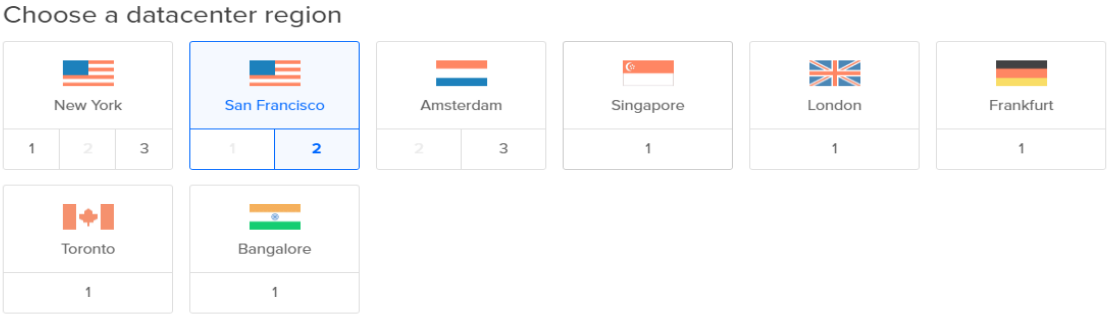
Digital Ocean Block Storage allows you to create and attach additional storage volumes to your Droplets.



Volumes are independent resources that can be moved from one Droplet to another within the same data centre. Attached volumes function like locally connected storage drives, allowing you to manage your storage with familiar tools and techniques.

9.4. Choose a data centre region

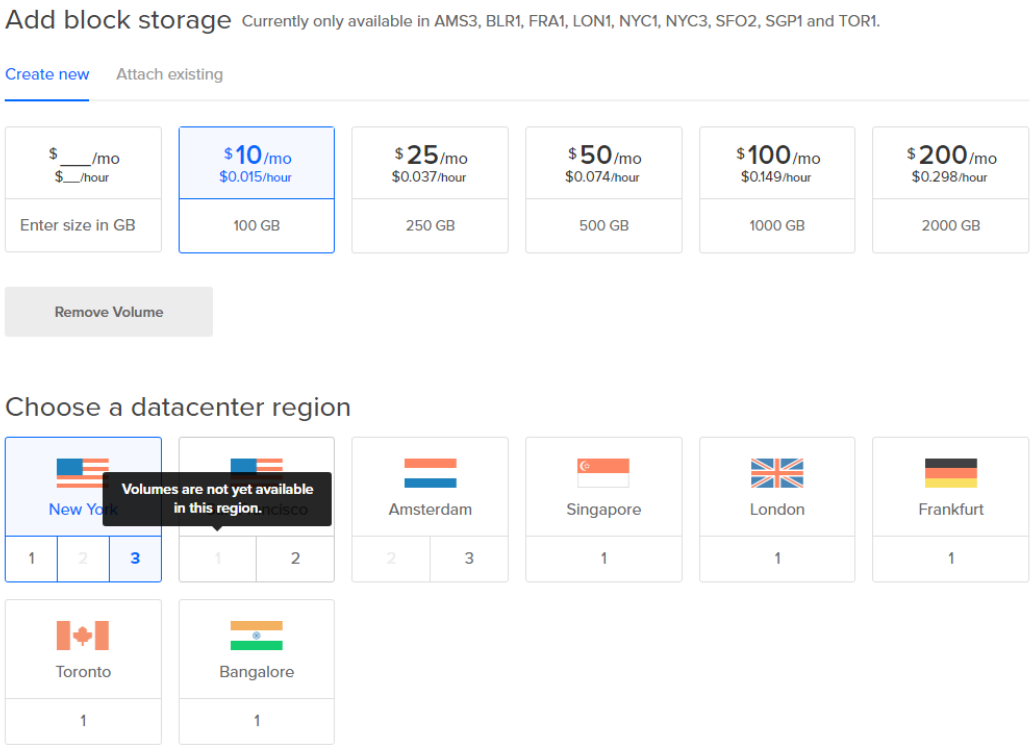
Next, you're given a choice of data centre regions.



For the best performance, choose the data centre nearest to you and your users. More distant server locations may increase the server's latency without providing any practical benefits.

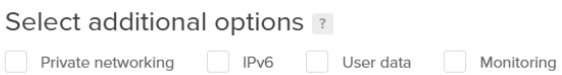
Your decision may also be guided by features which are not yet available in all regions when they are first introduced. This **Create** page will provide guidance when features have limited availability.

For example, if you selected Block Storage during its rollout, certain regions would be grayed out. A message in the **Add block storage** section and tooltips over the disabled data center region would explain:



9.5. Select additional options

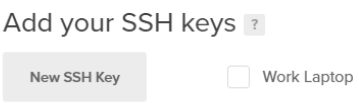
The **Select additional options** section allows you to choose from several additional services, most of which add no extra cost.



- **Private Networking** enables an additional networking interface that can only be accessed by other Droplets within the same datacentre. This can be helpful to keep traffic between Droplets from being routed outside the datacentre over the public internet. Private networking is provided at no extra cost.
- **IPv6** enables IPv6 access for your Droplet and incurs no additional cost.
- **User data** enables you to pass arbitrary data into the user-data key of the DigitalOcean Metadata service. This setting is required for CoreOS Droplets. Using user data adds no extra cost.
- **Monitoring** adds the DigitalOcean agent to collect extended metrics and create alert policies. Monitoring is provided at no additional cost.

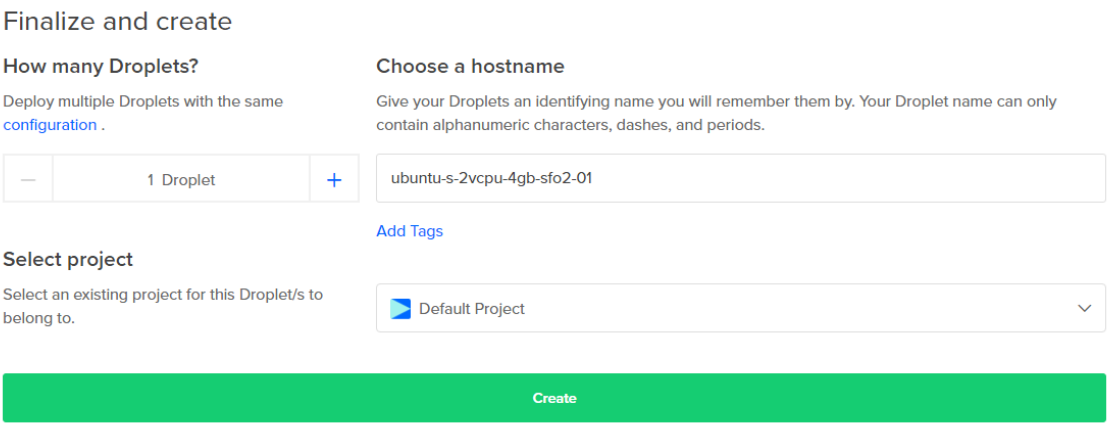
9.6. Add your SSH keys

SSH keys provide more security than using a password and some users find them more convenient as well. You have the option to use them in the **Add your SSH keys** section. Once you create and upload a key, it is available in your account. Now and in the future, you can check the box by the key name to add it to Droplets.



9.7. Finalise and create

The **Finalise and create** section of the **Create** page allows you to choose the number and name(s) of the Droplets you're creating, add tags, and assign the Droplet to a project.

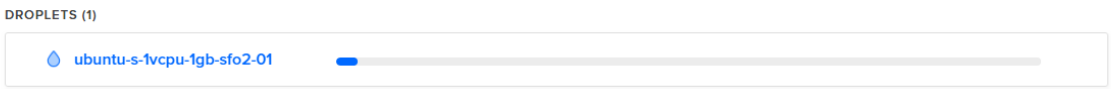


By default, a single Droplet will be created. Adjust the number of Droplets by clicking the plus, **+**, or minus, **–**, buttons.

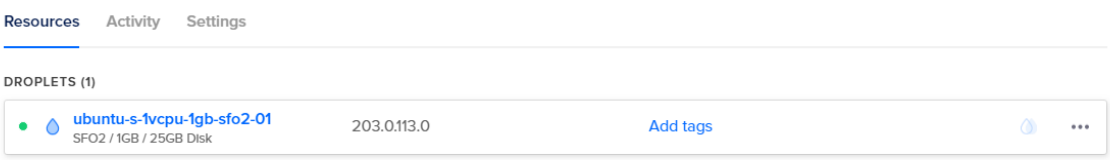
Each Droplet must have a name. These names are used in the Digital Ocean Control Panel and as the server's hostname. A default name is provided based on the options you selected, but you can modify the name(s) to suit your needs.

Using an FQDN (fully qualified domain name)(e.g., droplet1.example.com) as the Droplet's name will automatically generate PTR records for your Droplet based on that name. This also applies if you rename a Droplet after creation.

Once you have selected your options, click **Create**. A progress bar displays how close your Droplet is to being ready.

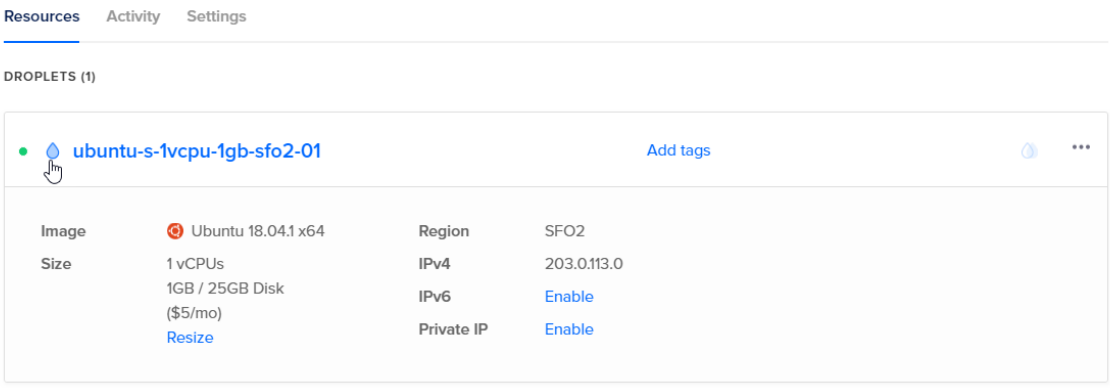


When the setup is 100% complete, the IP address of your Droplet will be displayed.



When the progress bar reaches 100% and the IP address is displayed, you're ready to log in to your Droplet.

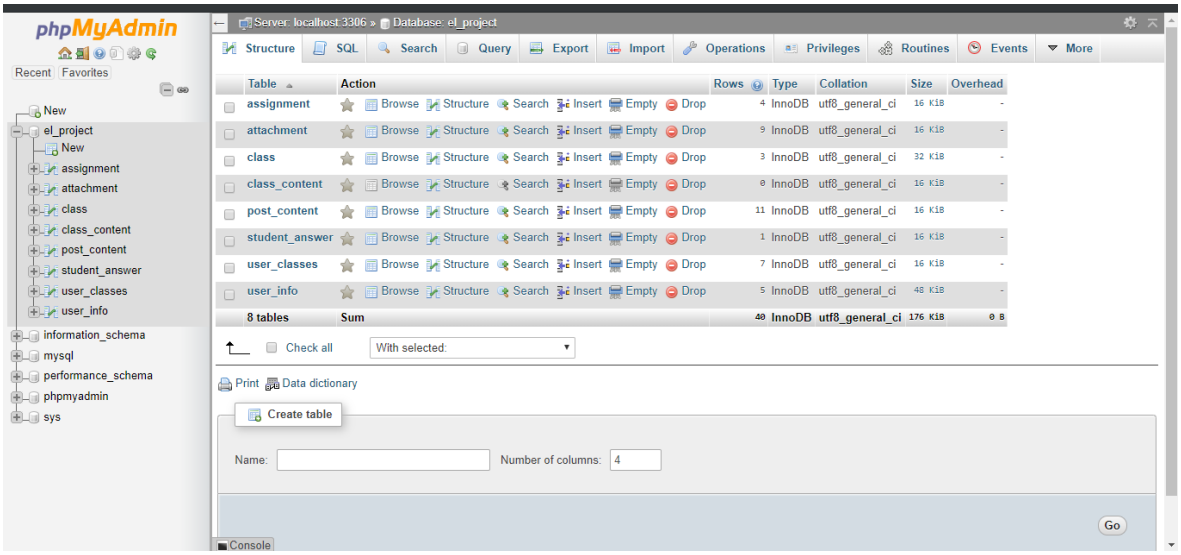
To go to a Droplet's detail page where you can make changes, click its name or go straight to the task you want using the More menu. You can also get a quick view of the Droplet's details by clicking the icon by the Droplet's name.



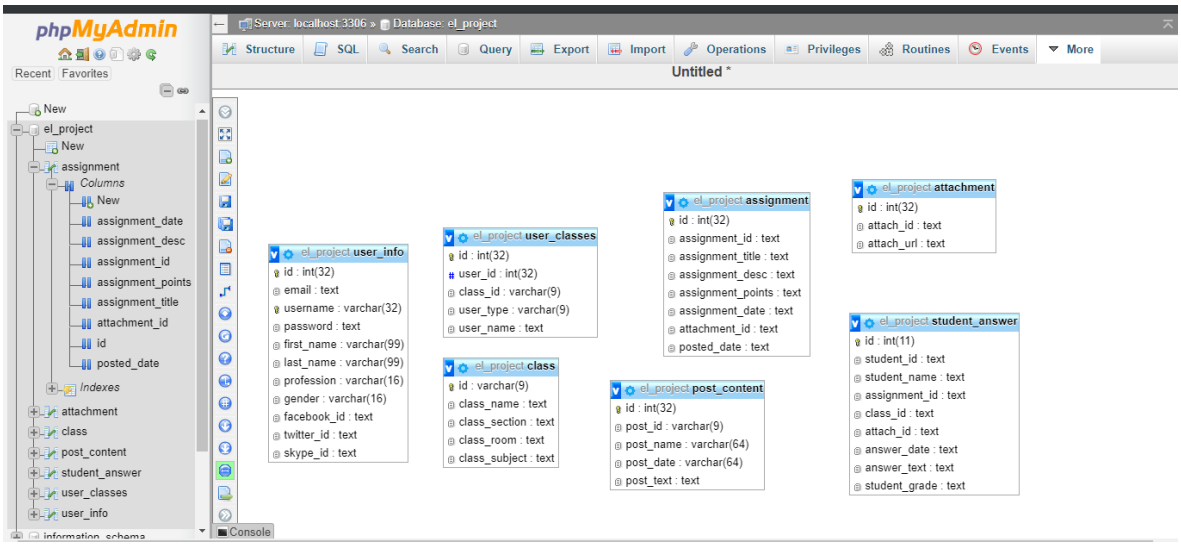
9.8. Setup the database

As a part of my project is the database of the application where all the data will be stored in this database for future accessing, I used php My Admin for creating and designing the database.

The classes that have been created are below:



The database relation between the tables is:

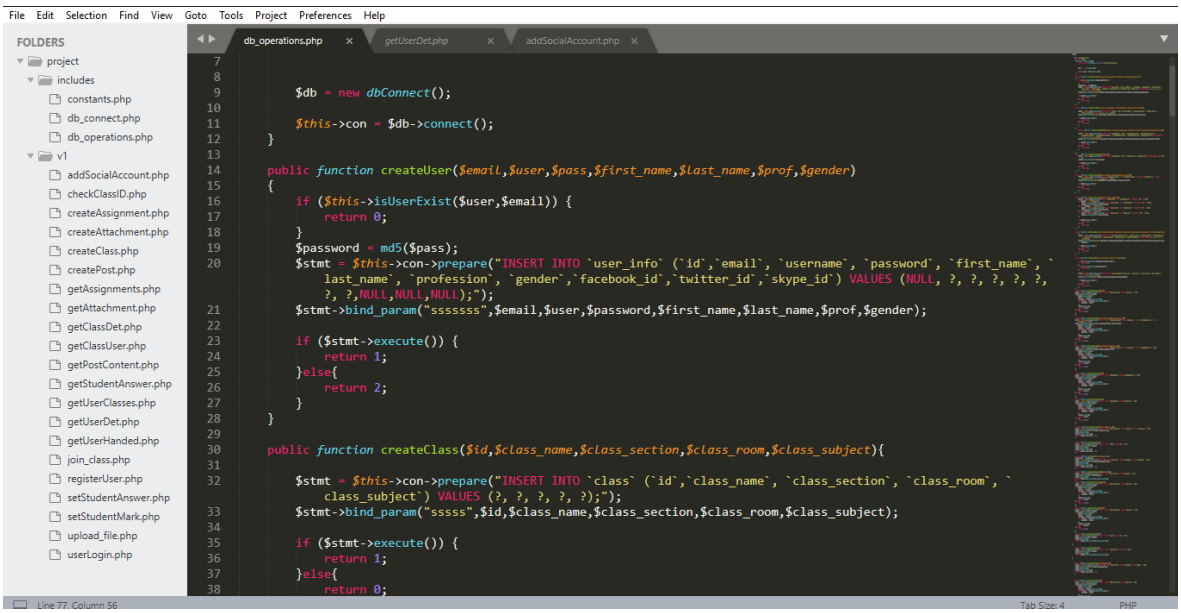


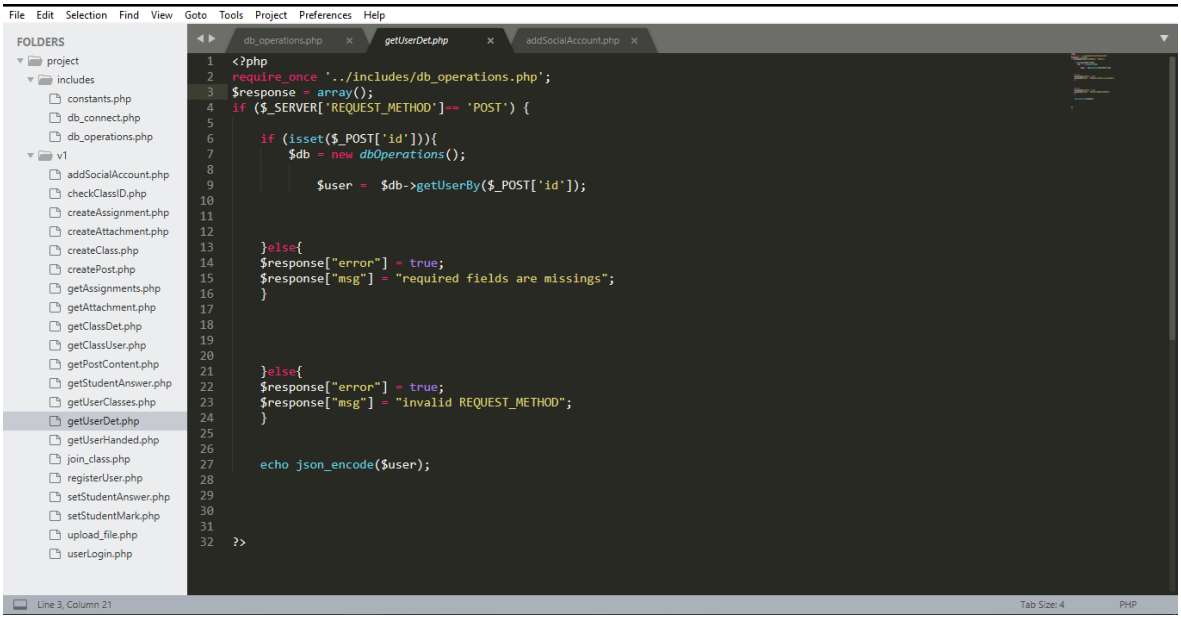
9.9. Up the server side system

As we know we need a server-side system (PHP) to communicate between the database and the application using some methods and class in php,

We need to retrieve the data from the database and convert it to a JSON and send it to the application to deal with (will be discussed later)

And here an example of the code



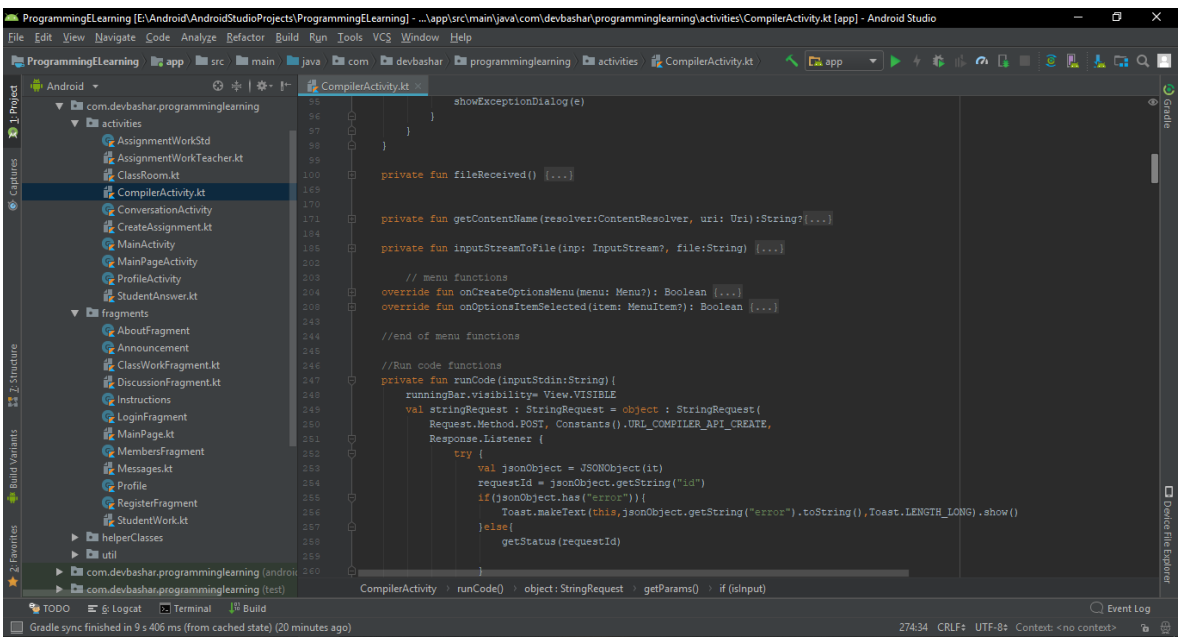


As shown above the code is organised by files and folders to easy access and update or modify the code The files constans.php and db_connect.php are to establish a connection with the database The file db_operations.php contains the methods to communicate with the database's tables as shown above And the rest files in the folder v1 Are to retrieve and set a data from the database

9.10. Setup the android studio (code)

After setup the server, database and the server-side system now it is time to setup the android application code by using android studio IDE I created the classes, the activities and the fragments.

All the codes and the files have been organised and setup in folders to help me read them well for future updates or modify



In the activities folder I got all the activities they have been applied to the app such as Compiler Activity as shown above. In the fragments folder I got all the fragment or sub activity In the helper Classes folder I got all the classes that helps me to connect with the server and doing other jobs. And finally, the util folder is to read and write from and into the device storage By using Kotlin as a main language for the app, it does help me a lot writing the code And integrate all the functions to make the app work Also, I used some SDK or libraries to help me write the code

9.11. Setup the android studio (User Interface design)

As a UI the main language to use is XML

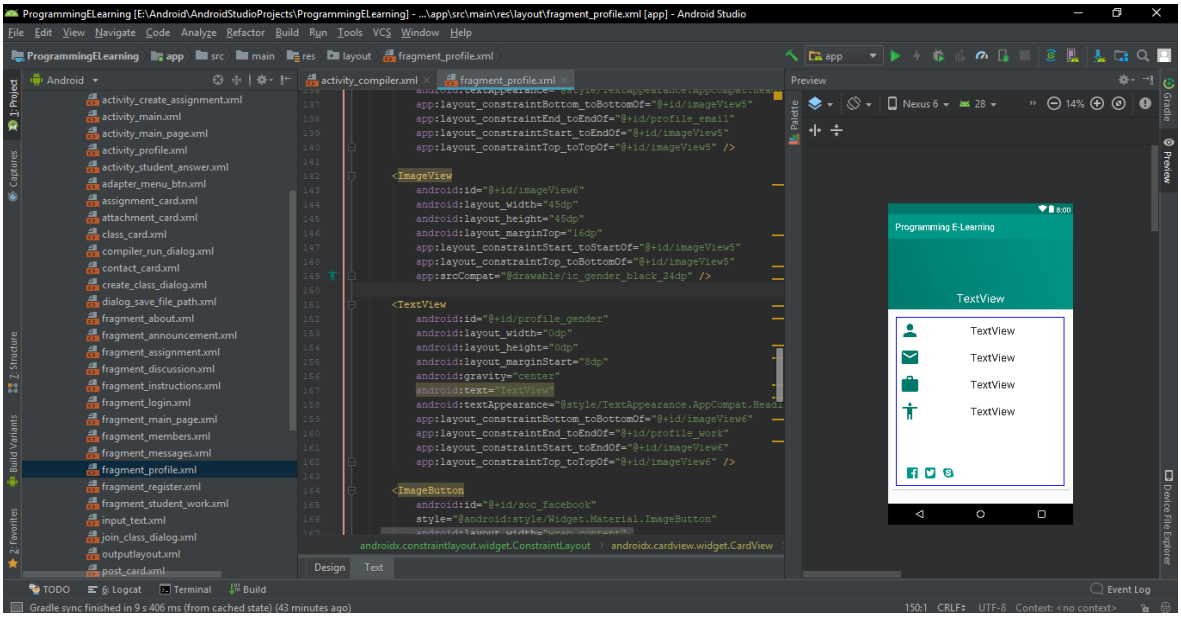
Extensible Markup Language (**XML**) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The W3C's XML 1.0 Specification and several other related specifications—all of them free open standards—define XML.

The design goals of XML emphasise simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services.

Several schema systems exist to aid in the definition of XML-based languages, while programmers have developed many application programming interfaces to aid the processing of XML data

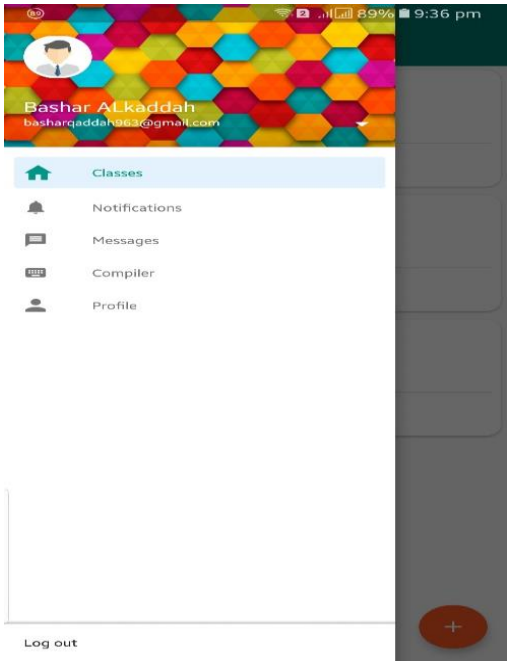
All the XMLs UI have been designed in Material design to give the user the best experience using the app

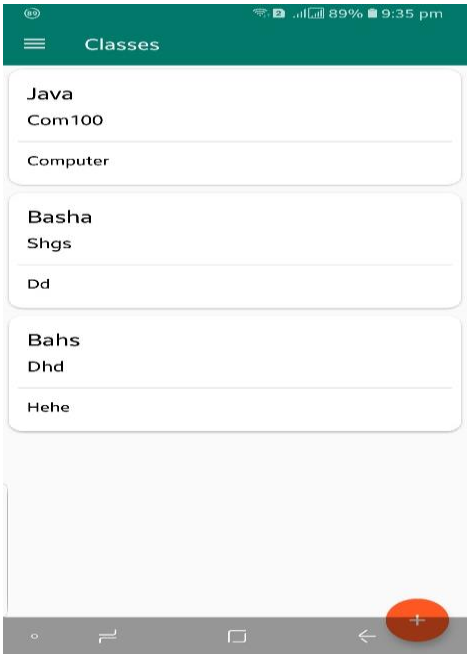
The figure below shown an example from the app for xml file

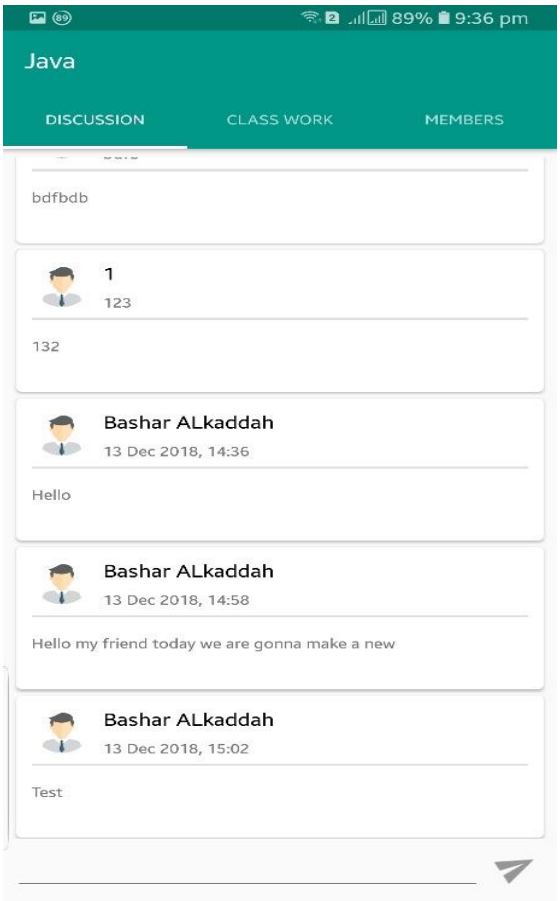


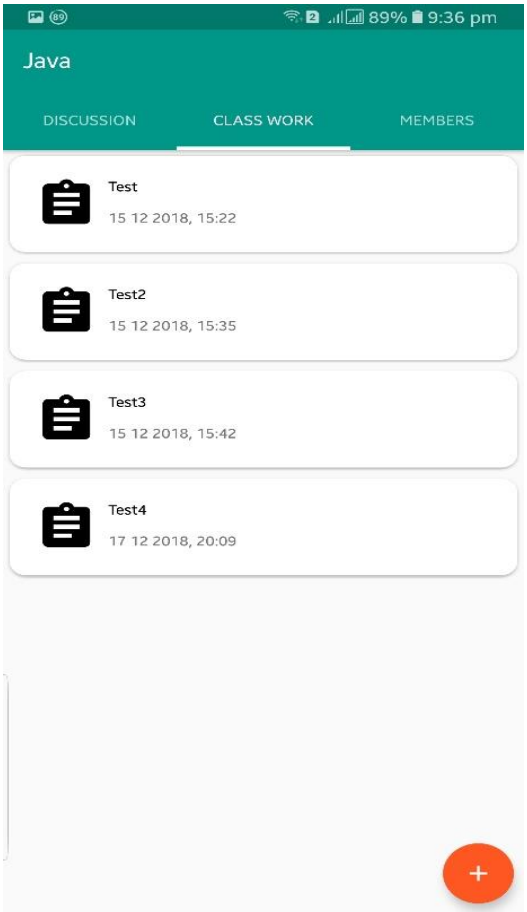
Salama, R., Uzunboylu, U. & Alkaddah, B. (2020).Distance learning system, learning programming languages by using mobile applications. *New Trends and Issues Proceedings on Humanities and Social Sciences. 7*(3), 23–47. Available from: www.prosoc.eu

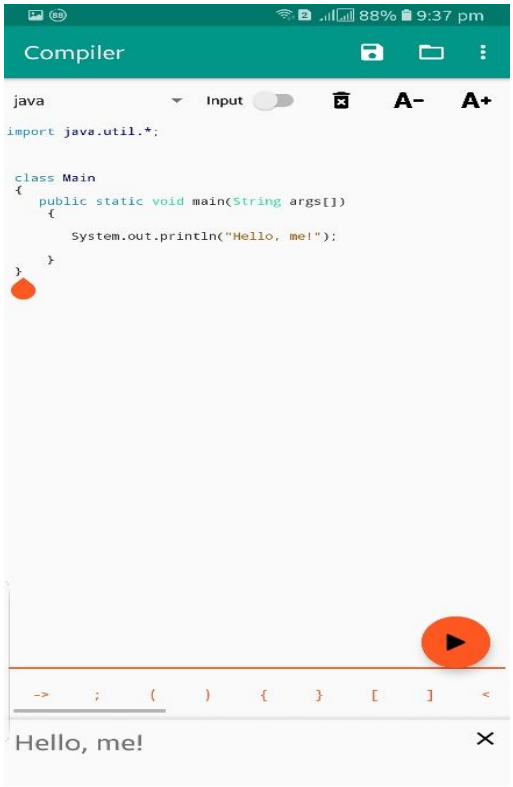
Screenshots of the app

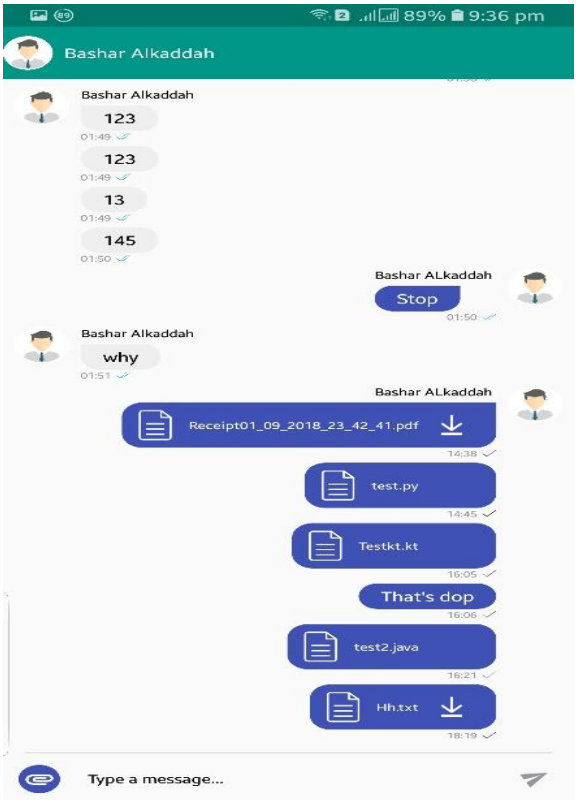


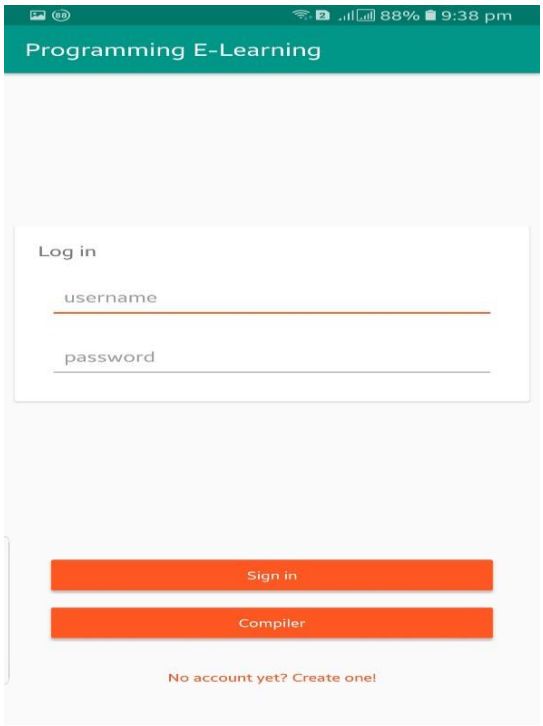


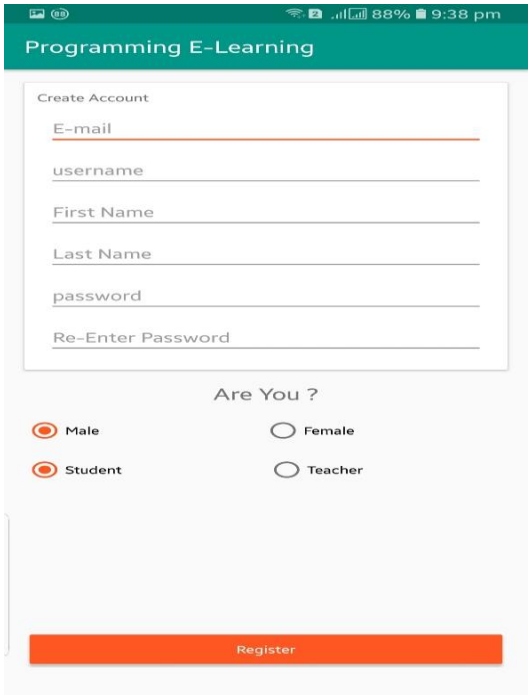

89% 9:36 pm
Java
DISCUSSION
CLASS WORK
MEMBERS
bdfbdb
1
123
132
Bashar ALkaddah
13 Dec 2018, 14:36
Hello
Bashar ALkaddah
13 Dec 2018, 14:58
Hello my friend today we are gonna make a new
Bashar ALkaddah
13 Dec 2018, 15:02
Test


89% 9:36 pm
Java
DISCUSSION
CLASS WORK
MEMBERS
Test
15 12 2018, 15:22
Test2
15 12 2018, 15:35
Test3
15 12 2018, 15:42
Test4
17 12 2018, 20:09


Compiler
java
Input
A-
A+
import java.util.*;
class Main
{
public static void main(String args[])
{
System.out.println("Hello, me!");
}
}
Hello, me!


Bashar Alkaddah
Bashar Alkaddah
123
123
13
145
Bashar ALkaddah
Stop
Bashar Alkaddah
why
Bashar ALkaddah
Receipt01_09_2018_23_42_41.pdf
test.py
Testkt.kt
That's dop
test2.java
Hh.txt
Type a message...


Programming E-Learning
Log in
username
password
Sign in
Compiler
No account yet? Create one!


Programming E-Learning
Create Account
E-mail
username
First Name
Last Name
password
Re-Enter Password
Are You ?
Male
Female
Student
Teacher
Register

Application Features

App Sections

1. Courses
2. Announcement and news
3. Chat Camp Messages
4. Online Compiler
5. Profile
6. About App

Teacher's features

1. Register as a teacher (lecturer)
2. Create classrooms
3. Discussion page for all his/her student
4. Give his students assignment to do
5. Also, he can Write his own code on the built-in compiler and see the result
6. Receive and check his student's assignments and make notes
7. Start a live chat with his student
8. Profile page to share with users his/her social media accounts
9. Notifications

Student's features:

1. Register as a student account
2. Join to a classroom
3. Discussion page to discuss topics with others
4. Learn some basic information about the programming (i.e. codes, syntax, and more)
5. Write codes on the built-in compiler and test it
6. Send the code that he has made it to his lecturer
7. Start a live chat with his lecturer
8. Profile page to share with users his/her social media accounts
9. Notifications system

10. Conclusion

This paper provides you with knowledge about our e-learning system and which tools that we used.

The online courses may be unfamiliar to many students and teachers, so this paper may be help you to try a new teaching technology with the learning Management system.

In this paper, we have mentioned about Teacher and student features, these features will make you more attractive to go on and create your courses and start teaching your student, or to join other teacher classes and start learning.

This paper will help you to understand how we make the e-learning system by messages or comments, also how you can compile your code with built-in online compiler.

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