

CLI, IIT Gandhinagar

In-service Training Program KVS CS PGT

June 08, 2018 to June 19, 2018




Summary Report

Center for Creative Learning(CCL) IIT Gandhinagar conducted the first spell of Inservice Course for Kendriya Vidyalaya Sangathan (KVS) Post Graduate Teachers (PGTs) of Computer Science from June 8-June 19. 52 PGT Teachers from across the country came to the IITGN campus for a 12 day workshop on Basics of Computer Science and Python. The facilitation was done by Computer Science Faculty of IIT Gandhinagar and members of CCL. [Anirban Dasgupta](#) (B Tech IIT KGP, 1999, PhD Cornell University 2005), [Neeldhara Misra](#) (PhD IMSC 2012), Manish Jain (IIT Kanpur 1993), Ravi Sinha (IIT Delhi).

In 2018, for the first time Python is being introduced in the CBSE Curriculum (instead of C++) and the participants were very apprehensive initially wrt to new language. As a result all the CS teachers were apprehensive about teaching python in classrooms. The overarching idea of the workshop was to introduce the teachers to a Python concepts and basics of Computer Science in a manner that can be engaging. There were few lectures but most of the workshop was experiential, in form of lots of exercises, activities, models that teachers made, stories and playing games! Yes games that we can play to understand sorting, searching and even Computer Architecture.

Teachers also made a programmable robotic arm, uncovered the complex concepts of computer science like sorting algorithms using games and group activities. The concepts of curriculum was covered in lucid manner. Right from advanced programming in python, to Django and SQLite was covered. Classroom management techniques were also discussed and teachers were exposed to platform such as rep.it and canva which makes the process of conducting test very easy! The faculty from the Computer Science and Engineering discipline of IITGN were also



involved with the CCL team during the workshop. The teachers got an opportunity to update their knowledge and upgrade their tutorial skills. They gave encouraging feedback to conduct such programs in future also.

OUTCOMES

The biggest accomplishment of the workshop was that teachers became extremely comfortable at transacting Computer Science in a revamped curriculum using python. Their fears of learning a new language and its concepts were mitigated after going through a immersive, 12 days of experiential learning experience. The engagement was also evident from the fact that each participant spent almost 45 minutes filling out the feedback forms which are here [CLICK HERE](#) Almost everyone wanted the second spell to happen in a similar manner at the same place.

Snippets of the feedback of teachers

A This workshop was on a whole different level & reason. It was not to target us but provide better education opportunities to the children through us. It feels superb when the learning is useful for others in dire need.
The platform where the relationship is built first before teaching/lecturing is certainly better.
The assignments were really helpful to achieve the target of learning a new language (& we kind of did achieve it). It was not one way flow like other such workshops. ..

In Comparison to previous workshops:

1. Work in practical manner and exposure by doing himself.
2. New innovatives and approaches to do more.
3. Knowledge is enhanced by 'Learning By Doing' method and proven that experience is knowledge.
4. Good environment, cleanliness, healthy food and facilities for stay.

Here all the participants are completely free to do their work, Computer Lab are opened for 24 Hours, Internet is available 24 hours for any type of help. I haven't feel such experience before.

Other workshop generally follows the same pattern for curriculum teaching but here I saw that mentors focus on making children and making nation. They have different ways of solving problems. They tell us the things which we never thought about and I think if we provide the same teaching & knowledge to our students, it will help in building nation with bright minds. They don't go on rote or fixed method of teaching rather they focus on exploring & finding our new ways to explore the things. That's the unique way of education being imparted here. Here the main goal is ~~to~~ not to cover the syllabus but it is to uncover the syllabus.

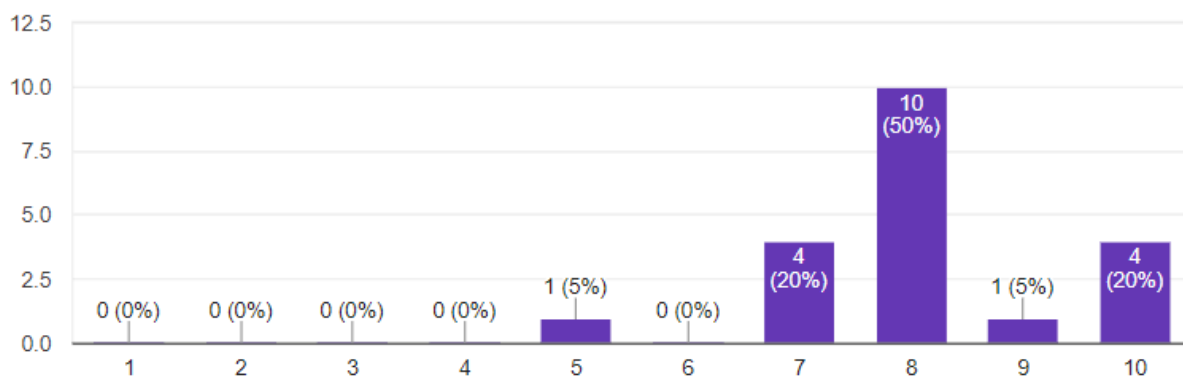
The thing that touched my heart is the meaningful, ~~stories~~ interesting & educational stories being told to us by respected Manish Jain Sir. They were like boosters and will always remain stored in my heart & mind.

This course will really help for teachers to know about their field of interest. It will give them the right direction in their future. It will give the teachers a hands on experience which may be very helpful for them.

We did a survey and interview to measure the impact of the program. The following are the key highlights

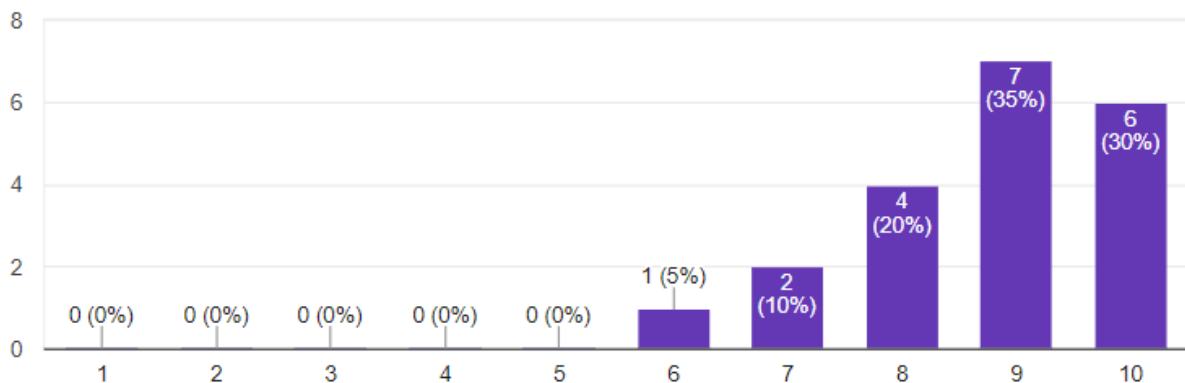
- **Boost to Creativity and Confidence**

Of all the respondents who took the survey, more than 75% of them felt confident after going through the inservice coursework that they will be able to teach python in the classroom. This is significant improvement from the baseline when all the participants were worried about the change in language of the course and had apprehension about learning python.



- **Interdisciplinary nature of curriculum**

The diverse curriculum open the minds of educators to possibilities. They can now integrate the STEM subject along with the computer science. They also now appreciate that computer science is not something which is used in isolation. Its use in variety of fields such as bioinformatics, robotics etc. The introduction of microcontroller gave them a tool to create live projects at affordable cost in their classroom itself.



- Empower educators with tools to make classroom management effective

More than 80% of the participants, approached the course instructors to take special session on using innovative pedagogy along with technology to enhance their teaching ability. Tools like Canva and repl.it which automates the test taking session and correction, saves a lot of non-academic hassle and enable teachers to give more time to clearing the doubts of children.

- Of all the respondents who took the survey, >90 % wants to have the second spell here

Almost all the respondents expressed their interest to have periodic follow up session at IIT Gandhinagar. They also stressed the importance of making such innovative pedagogy reach all the CS teachers in India so that they become neoteric agents via to make learning fun and conceptual for every child.

Navneet Sadh, a teacher from KV Kokrajhar, Assam expressed his thoughts about the workshop, *"This workshop was on a whole different level. The target was to provide better education opportunities to children through us. My classes are going to be full of such activities."*

Elaborating on the workshops, Mr. Manish Jain, Head of CCL, IITGN said, *“The curriculum of KVS has been revamped. So now, the teachers have to teach Computer Science in Python language instead of C++. We showed them how Computer Science can be taught in lucid manner using Python. For instance, teachers learnt about graphs, sorting, parallel computing and computer architecture by playing many games.”*

Centre for Creative Learning (CCL) was established with an aim to provide a joyous learning environment, which can lead to conceptual understanding. It emphasizes the importance of hands-on learning instead of mere chalk n’ talk approach of teaching to make education engaging, effective and easier for students to understand.



About Centre for Creative Learning(Earlier CLI)



We all learn best when we do, make, explore. Pull things apart, put them back together. Our current system, competitive and fast-paced environment, however, seldom provides space for such learning.

With this aim, we started Creative Learning Initiative (CLI) at IIT Gandhinagar almost a year ago. This journey, which started from an empty 400 sq feet room and now full with STEM (Science, Technology, Engineering, Mathematics) based models/toys/exhibits made by us, has been extremely rewarding.

Since then, we have worked with over 6000 teachers , 1000+ college professors from states all across India. We have conducted short courses with Ahmedabad University on Hands-on recreational STEM focusing on making things and then exploring the concepts behind.

We have designed 200+ new activities, tinkering with different kind of materials which are there in the lab.

Our current team includes Manish Jain (B.Tech IITK 1993, EE), Ravi Sinha (BTech IITD), Gaurav Kumar (BTech IITB), Neeraj Sharma (Btech ME), and Pankaj Godara (BTech EE) who are all passionate about making STEM education joyous. Most of their time is spent on designing and creating interesting toys as well as in dissemination.

Website: <http://initiatives.iitgn.ac.in/iitgncli/>

Youtube channel: <http://youtube.com/iitgncli>

Facebook: <https://www.facebook.com/pg/iitgncli/>

Day Wise Schedule

Sessions		I		II		III		IV		
Days	Date	10:00 - 10:30		10:30- 01:00		2.00 - 3.30		03:45 - 05:00		
Day-1	8.06.2018	Registration		Tea Break	Inauguration +Kichdi + Selling Iron(Manish)	Lunch Break	Pre-Test			
Sessions	S. No	Date	9.00 - 9.15	I	15 min	II	1 hr	III	10 min	IV
			9.15	09:30 - 11:00		11:15- 01:00		2.00 - 3.30		03:40 - 05:00
Day-2	9.06.2018	Sa		Context of CS as engineering (Manish)	Tea Break	Context of CS as science (Anirban)	Lunch Break	Turtle (Ravi)	Tea Break+ Nimbu Pani	Project discussion
Day-3	10.06.2018	Su		Comp Arch (Manu)		Comp Arch (Manu)		Comp Arch - Game (Manu, Manish)		Intro Arduino(Ravi)
Day-4	11.06.2018	Mo		Python (Neel) variables, expressions, control flow		Python(Anirban) functions, lists/tuples, dictionaries		Python (Neel) variables, expressions, control flow		Python(Anirban) functions, lists/tuples, dictionaries

Day-5 Tu	12.06. 2018		Python(Neel) regular expressions		Python(Anirban) File input/output, requests(?)		Python (Practical Exercise) Lab 7/108		Python (Practical Exercise) Lab 7/108
Day-6 We	13.06. 2018		Python (Practical Exercise) Lab 7/108		Python (Practical Exercise) Lab 7/108		CS Unplugged		Arduino Basics
Day-7 Th	14.06. 2018		Adv Python(Neel) django Lab 7/108		Adv Python(Anirban) OOP Lab 7/108		Python (Neel) Lab 7/108 RegExp		Mid - test + CLI Straw Activities
Day-8 Fr	15.06. 2018		Python libraries (Neel)		Python libraries (Anirban) + Exceptions handling		Python Group Project		Python Group Project
Day-9 Sa	16.06. 2018		9:30-10: Manish Sir 10-11: Installation		11:15-12: Anirban 12-1: Neel (Django)		Making and Programming Mechanical Arm(Pankaj)		Making and Programming Mechanical Arm(Pankaj)
Day-1 0 Su	17.06. 2018		Making and Programming Mechanical Arm(Pankaj)		Making and Programming Mechanical Arm(Pankaj)		Demo Session		Laser cutting + Robotic Frog
Day-1 1 Mo	18.06. 2018		Post Test:9:30-10:30 Project Work		Project Work		1:15 : Group Photograph 1:30-2:30: Panel Discussion- 1-101 (ethics in CS) Science City		Science City
Day-1 2 Tu	19.06. 2018		Project Presentation		Open House		Display/Feedback/Ce rtificate		Display/Feedbac k/Certificate

Day Wise Summary



Blog Link <https://iscpgtcs18.wordpress.com/>

DAY-1 (08-06-2018)

The first day of the in service course begins with the registration of participants and an introductory session followed by a tea break. After the tea break, a session was conducted by Mr. Manish Jain in which he emphasised the importance of clarity of concepts through an example of selling iron and “kichdi” concept.

After this session Mr. Ravi gave a brief description of the schedule of 12 days in service course. Then Miss Neeldhara conducted a session on problem solving techniques and how to arrive at a best possible solution. Then there was lunch Break.

After the lunch break, a Pre Test was conducted for the participants. The First day of the in service course concluded after the completion of Pre Test.





DAY-2 (09-06-2018)

The day started with the morning assembly presented by the members of JAVA group. After the assembly there was an interesting small session of introduction in which participants gave their introduction including their thoughts.

Then Manish Jain sir delivered a lecture focusing on computer science and technology. In his lectured he shared his experience in the area of Chip Design. After that Anirban Sir deeply explained us about history of Computer Science and its correlation with Mathematics. Then we enjoyed delicious lunch.

Immediately after lunch we assembled in computer lab and had very exciting practical session on Python Turtle by Ravi sir and Neeldhara Madam.

After tea there was an useful session on project development in computer science, the session was taken by Anirban sir and Neeldhara Ma'am jointly. All the participants pitched their ideas for their respective Projects. A the end we found Day 2 very exciting and fruitful.



DAY-3 (10-06-2018) (Fortran Group)

सुप्रभात,

केन्द्रीय विद्यालय संगठन के स्नातकोत्तर संगणक विज्ञान शिक्षको के लिए आयोजित बारह दिवसीय सेवाकालीन प्रशिक्षण के तीसरे दिवस की रिपोर्ट प्रस्तुत है :-

दिवस का आरम्भ मधुर और प्रेम भरी ईश वन्दना से हुआ ! जिसमे सभी सहभागियों ने सर्व-कल्याण की कामना की ! तदुपरान्त श्रीमान मनु अवस्थी (Asstt. Prof. Computer Sc.) ने संगणक संरचना विषय पर हमें रोचक जानकारी दी तथा सभी प्रशिक्षुको द्वारा इसे सराहा गया! अल्पाहार के उपरांत श्रीमान मनु अवस्थी ने असेंबली भाषा का ज्ञान प्रदान किया.! सभी ने अल्पाहार ग्रहण किया ! तत्पश्चात श्रीमान मनु अवस्थी () ने हमें असेंबली भाषा में की जाने वाली प्रोग्रामिंग के तथ्यों से अवगत कराया ! सभी ने मध्यकाल का भोजन ग्रहण किया और स्वयं अध्ययन के लिए प्रयोगशाला में गये ! श्रीमान मनीष जैन , श्रीमान मनु अवस्थी और सहभागियों ने प्रोग्राम क्रियान्वन के पदों की जानकारी एक्टिविटी द्वारा समझी तथा सभी ने सक्रिय रूप से भाग लिया ! सभी ने सायंकालीन अल्पाहार का आनंद लिया ! तत्पश्चात श्रीमान रवि ने आर्डुइनो सॉफ्टवेयर की विधि को समझाया तथा स्वयं

प्रणाली को

धन्यवाद !



निर्मित यन्त्र की कार्य दर्शाया !



DAY-4 (11-06-2018)(Group 4 Cobol)

Report was presented by Bharti Yadav, Naranul. Day Four was started with Prayer of God by members of Fortran Group in which Mrs. Savita sung motivational song where as Mr. Satish sung a devotional song and mesmerize all the audience. Thereafter a brief introduction on Python given by Miss. Neeldhara, faculty of IIT, she tell us about the various variable declaration, conversion, operators and different expression and slicing of string. That session help us a lot to understand how Python program is basically running.

After Tea break Mr. Anirban, Faculty of IIT, continued the Python language and tell us about functions, list and different operations on string, indentation, if else, and nested if structure in Python. In that session he had given us some problems also to sort out and a healthy discussion gone on different queries.

After lunch break, Neeldhara Madm , provided an assignment on repl.it and help all the left out students to join repl.it. In that she also tell us about how string works on range and extracting different index of given string.

The session was completed by the healthy discussion on a query given by Mr.Anirban, which all the members of this workshop were tried to sort out, but at last solution was given by one of the member, Mr.Dharmender, who voluntary given the solution. At last I could say that forth day was completed with lot of knowledge and Python Programming done by all the PC's under the guidance of our course Resource person Mrs. Vandana and Mr. Amit Saxena. The report was ended by Mrs. Bharti,PGT(C.S), K.V.Raghunathpura, with Sundar Pichai quote "It is important to follow your dreams and Heart. Do something that excites you"



DAY-5 (12-06-2018) (Python Group)

Fifth day of In-Service Course for PGT (Comp Sc.) started with Morning Assembly as usual. During the activities of Morning Assembly Jyoti Madam presented a poem which was center of attraction. After morning assembly Asst. Prof. Neeldhara explained about Python concepts like tuple, list, dictionary etc by demonstrating on projector with a number of examples. She responded the queries raised by the participants. After Tea Break Prof Anirban from IIT Gandhinagar given lecture on the Python Concepts (Functions and File Handling). He demonstrated typical problems and their solutions. Post Lunch session was scheduled for Hands on practice for participants. Participants practiced the concepts of Python by solving assignments using repl.it platform. All participants did their assignments enthusiastically. The day ended with increased knowledge and skills.





DAY-6 (13-06-2018) (Group 6)

The day 6 was started with a beautiful morning prayer to see God's guidance, comfort, protection and presence presented by Group 5 (Python). The thought was given by Mr. Kapil, news was given by Mrs. Monika and report of the day was read by Mrs. Geeta . All participants took part in the special item "The Laughter Lassi" which was presented by Mr. amit & Mr. Anoop was really enjoyed by all after that Mr. Amit Saxena our resource person gave some useful suggestion about Morning Assembly followed by the link of PGT CS 2018 In-service Course website shared by Mr. Navneet.

Morning session was started by Practical Session. Energizing tea breaks was given to the participants but they are so busy in doing their Python assignment given by Ms. Neeldhara that nobody wanted to get up .

After having lunch break Mr. Anirban professor of IIT Gandhinagar told about CS Unplugged. CS Unplugged is a collection of free teaching material that teaches Computer Science through engaging games and puzzles that use cards, string, crayons and lots of running around. The goal of CS Unplugged is to promote Computer Science to young people as an interesting

,engaging and intellectually stimulating discipline. He also told about the sorting by learning by doing method with the help of Mr. Ravi and participants. We all enjoyed the activity “Card Flip magic and Sorting method” and learned a lot.

After that Mrs. Neeldhara told about how to guess a number and same was presented by Mr. Dharmendra in between Mr. Manish told how to count numbers more than 20 thousand on finger and about Martin gardner who was an popular Mathematics and Science writer and promised to share the name of book on the last of our In-service Course .

At last Mr. Ravi told about how to install Arduino and distributes the kit to all the participants. All this was about the Day 6 which was really fruitful.





DAY-8 (15-06-2018) Report by Group 8 (SQL)

Good morning to one and all present here. The day 7 was started with the prayer, thought, and after that a special item presented by Sonia and Ms. Shikha in which they asked some riddle which was really a enjoyable for all of us.

After that a session of Ms. Neeldhara about how to develop a webpages and Django or our project in which our project on Flock. After that a tea break and a brief description on development of different type of exception and how to solve that exception by Mr. Anirban In that he tells about error occur due to divide by Zero , I/O error, type error etc with the help of try, except code , user defined exception and matplotlib lib which was really knowledge session for all of us.

After that we all of us has a great lunch then a session of group distribution of project s and how to implement that project was discussed in the lab along with Mr. Ravi and Mr. Ritwik a student IIT Gandhinagar and then different project was suggested by Mr. Ravi based on Web based application , Ardino based project.etc And after that different projects was chosen by them .

At last, Mr. Anirban and Ms. Neeldhara Maam has explained us about the role of us in that project and really that session was really a knowledgeable session for us.



Glimpses of Cultural Night

DAY-10 (17-06-2018)

रिपोर्ट-दिवस १०

समूह: पर्ल

दिनांक १६-०६-२०१८

प्रातः प्रार्थना सभा समूह आठ (SQL) के द्वारा आयोजित की गई जिसके अंतर्गत विशेष कार्यक्रम में योग क्रियाओ से सभी प्रतिभागियों को लाभान्वित किया गया ।

महोदय श्री मनीष जैन जी द्वारा हेमिंग कोड की जानकारी दी गई ।प्रशिक्षण के प्रथम सत्र में श्री ऋत्तिक द्वारा एनाकोंडा सॉफ्टवेयर के इन्स्टोलेसन का प्रायोगिक प्रशिक्षण दिया गया ,तत्पश्चात श्री अनिर्वन सर द्वारा पाईथन के अंतर्गत डाटा डिक्शनरी व् डाटा फ्रेम की विस्तृत जानकारी दी गई ।

चाय मध्यांतर के पश्चात् नीलधारा मैडम द्वारा d-jango में प्रायोगिक प्रशिक्षण दिया गया व् webapp से अवगत कराया गया ।दोपहर भोजन उपरांत यांत्रिक कार्यशाला में श्री पंकज,श्री आशीष व् ईशिता मैडम द्वारा सभी प्रतिभागियों से समूह रूप में अलग-अलग यांत्रिक रोबोट बनाने का कुशल प्रशिक्षण दिया गया ।

अंत में प्रशिक्षण दिवस का समापन दो प्रतिभागियों के जन्मोत्सव मनाकर संपन्न किया गया ।

धन्यवाद ।


समूह: पर्ल

सदस्य:

श्री प्रवीण कुमार पवैया । श्री रणधीर मीणा

श्रीमती वानी कोछड़ । श्री दीपक सुल्तानिया

श्री भूपेंद्र नवदया





DAY-11 (18-06-2018) Group: PHP

The Day '10' Of Inservice Course Was Started With Morning Prayer Followed By The Thought Presented By Mr Randhir Meena, News By Ms Vani Kocher, Report By Mr Deepak Sultania And Quiz As Special Item By Mr Bhupender Navadaya Of The 'pearl' Group.

The Morning Session Of Inservice Course Was Started With The Motivational Stories By Mr Manish Jain That Describe Different Concepts Of Science. Mr Manish Jain And His Team Shows The Way To Develop The Code Of Robotic Arms Using The Arduino Project That Was Developed By The Different Team Participants Of Inservice Course On The Day '9'. Following The Instruction Given To Develop The Code, All Participants Actively Participated In The Development And Testing Of Code For Robotics And Different Movements Of Arm. Participants

Had Tried The Different Pattern Path For Movements Of Robotic Arms With The Support Of Mr Pankaj And Ms Ishita Of Iit Gandhi Nagar.

After Taking A Break, Mr Pankaj, Mr Neeraj And Its Team Shown The Different Developed Projects Of Cli Lab With The Detailed Working Of Different Projects Having Concept Of Science.


Taking Delicious Lunch, There Was A Session Of Fine Cutting Of Cardboard Sheets Used During The Making Of Robotic Arms With The Help Of Laser Machine. Each Participant Design Their Logo's In The 'dxf' Format To Be Cut By Laser Machine. Each Participant Visit The Laser Machine Room No. 109 Of Block 5 For The Cutting Of Their Logo's And Felt Happier. The Day Ended With The Preparation And Planning Of The Next Day.

Members name:

Resource person 1	Sh. Amit Saxena (PGT CS Sec 3 Rohini)
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Resource person 2	Smt. Vandana Tyagi (KV JNU)
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Team Members of IIT Gandhinagar:

1. Mr. Manish Jain
 2. Mr. Anirban Dasgupta
 3. Ms. Neeldhara Mishra
 4. Mr. Manu Avashti
 5. Mr. Ravi Sinha
 6. Mr. Ayush
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7. Mr. Pankaj Godara
 8. Mr. Neeraj Sharma

Relevant Resources:

- <https://www.arduino.cc/>
- <https://repl.it/>
- <http://pythonslides.netlify.com/>
- <https://html5up.net/>
- <https://hellowebbooks.com/setup/>
- <https://code.visualstudio.com/>
- <https://github.com/anirbandasgupta/KVPython>
- <http://blog.neeldhara.com/post/2018/june/firstdjangoapp/>
- <https://iscpgtcs18.wordpress.com/guest-lecture/>
- <https://www.pythonanywhere.com/>
- <https://getbootstrap.com/docs/3.3/css/>
- <http://pythonslides.review/>
- <https://repl.it/@navsx/squireblocks>
- <http://goo.gl/wnZoh2>
- Blog Link <https://iscpgtcs18.wordpress.com/>

Pictorial Glimpses of the overall session



























