

Digitalize

“In this digital age, we have an opportunity to transform lives of people in ways that was hard to imagine a couple of decades ago.” - Narendra Modi

Digitalization is the integration of digital technologies into everyday life by the digitization of everything that can be digitized. The literal meaning of digitalization gives an idea of development and technology dependent world. Briefly defining, digitalization means computerization of systems and tasks for better ease and accessibility.

Aim: Participants are invited to come up with innovative new Prototype or Methods that will help in efficiently solving one or more Problems mentioned below.

Note:

1.The following Problem Statements are just guidelines to help you. You are free to think like an unconventional thinker and come up with great innovations. So do not limit yourselves to these problem statements.

2.The projects should also be applicable in village areas. The projects applicable in village areas will be given more weightage.

Sectors

1. Power Distribution Utility:

Power Sector is undergoing dramatic changes from the conventional utility to a modern day Smart Utility and consumers are taking on the role of prosumers with Renewable Energy Integration ,Open Access, Micro Grids, Energy Storage solutions ,Energy Efficient appliances ,Electric Vehicle charging Infrastructure on the anvil.

Also the consumer of today is becoming more and more demanding in terms of service parameters on the commercial and technical front with requirements of quality ,uninterrupted and reliable supply .

Problem Statement:

How will the conventional utility transform into a digital utility with the help of Data Analytics, Artificial Intelligence, Mobility solutions and other digitalization interventions to serve customers for a better customer experience (residential, commercial & industrial consumers).

Come up with Innovative solutions in terms of digital interventions that a Power Distribution Utility should deploy for making it Smarter so as to not only fulfill but go beyond customers' expectations and at the same time ensuring Safe ,Green, Economical and Reliable Power Supply to end consumers .

Best Practices across various Power Distributions Utilities worldwide may be referred to for developing /improving on existing offerings to consumers.

2. Safety and Security:

Cyber Security

Cyber-attacks is a major problem faced by our country, one of the common attack was Wanna Cry Ransomware attack. Major sectors which we need to work upon
Seeing the current scenario, various types of cyber-attacks are occurring in our country, one of the major virus was WannaCry Ransomware attack which was suffered by all the country.

Women Safety

Various apps subjecting to women safety exist but they are not that reliable and effective so Techfest feels this is as a need of hour to work upon this segment.

Problem Statement: Come up with different innovative ideas with prototype that acts efficient tool that can be directly implemented for the women safety purpose.

3. Education for underprivileged:

The scenario of education in India is getting better. The curriculum is revamped every year and the classes are becoming smarter, but there is a major chunk of population still which is deprived of even the most basic education. For the underprivileged people in India, education is perceived as a high-priced luxury, and this false outlook continues with every new generation. The educational scene of this section of India comprising major part of population should improve and it is the responsibility of the educated portion to contribute so that financial conditions do not become a barrier to quality education.

Problem Statement:

Come up with an innovative idea or prototype to improve the scene of education in this underprivileged section of our population with the aid of Digital

4. Agriculture Sector

Agriculture not only provides for the food requirements of a country, it also makes the country self-sufficient and moreover, Agriculture has got a prime role in the Indian economy. Though the share of agriculture in national income has come down, still it has a substantial share in GDP. Agriculture sector, at present, provides livelihood to 65 to 70 per cent of the total population. The sector provides employment to 58.4 per cent of country's workforce and is the single largest private sector occupation. But unfortunately, this sector hasn't kept the same pace of development as others. Major technological interventions are needed to counter the growing uncertainties of nature. Only then will our Agriculture industry thrive and our farmers feel safe.

Problem Statement:

Participants have to present innovative ideas with prototype to resolve the problems in Agriculture sector with the help of digitalization.

5. Healthcare:

Healthcare is one the major fields in which digital transformation can play a vital role. The life expectancy in India is a mere 68.01 years. Also, the infant mortality rate is abnormally high at about 40 per 1000 live births. Numerous digital tools can be made to take care of the health of a person by which various fatal diseases can also be dealt with. The revolutionary technological advances can be put to great use here.

Problem Statement:

Participants have to come up with smart healthcare tools which may be helpful for both, a healthy person or a patient.

6. Corporate sector:

We are very well aware of importance of digitalization in corporate world. Nowadays customers can directly interact with a company. It creates a lot of transparency between the company and customer. Other than that, working culture of corporate world is undergoing a digital transformation, but still there are certain gaps to be filled, so that optimum usage of digitalisation can be made.

Problem statement:

Try to bring a innovative idea and prototype which would make our corporate world smarter than what it is at present.

7. Government sector:

Nowadays, Digitization has brought much needed transparency between the government and public, which indeed has improved the working of the government, to quite an extent. The most significant benefit of this is the decrease in corruption in our country. But for a country like India having such a large bureaucratic system, there is a great scope of innovative ideas for digital transformation.

Problem Statement:

Participants are expected to bring innovative ideas and prototype solution to improve the working of government system in India and bring in more transparency between government and public.

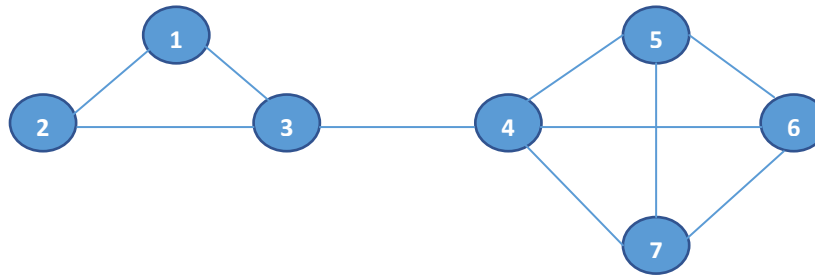
Brain teasers

Following are some interesting coding problems to solve.

Problem 1:

All Cliques Identification Problem

A complete subgraph of a graph is part of a graph in which all nodes are connected to each other. A clique is a maximal complete subgraph (not subsumed by any other complete subgraph). Given a general undirected graph identify all cliques with number of nodes ≥ 3



Input:

Each undirected edge of the network as an (i,j) pair where i,j = set of nodes

Example Input:

1,2
1,3
2,3
3,4
4,5
4,6
4,7
5,6
5,7
6,7

Output:

All cliques with number of nodes ≥ 3

Example Output:

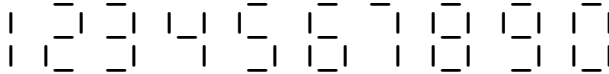
Number of nodes = 3
1,2,3
Number of nodes = 4
4,5,6,7

Note:

All the 3-node cliques that are contained in the 4-node clique should not be reported in the set of 3-node cliques

Problem 2:

Matchsticks are ideal tools to represent numbers. A common way to represent the ten decimal digits with matchsticks is the following:



This is identical to how numbers are displayed on an ordinary alarm clock. With a given number of matchsticks you can generate a wide range of numbers. We are wondering what the smallest and largest numbers are that can be created by using all your matchsticks.

Both numbers should be positive and contain no leading zeroes.

Input

On the first line one positive number: the number of testcases, at most 100. After that per testcase, one line with an integer n ($2 \leq n \leq 100$): the number of matchsticks you have.

Output

Per testcase, one line with the smallest and largest numbers you can create, separated by a single space.

Sample Input

```
4
3
6
7
15
```

Sample Output

```
7 7
0 111
8 711
108 7111111
```

Problem 3:

Given three strings, you are to determine whether the third string can be formed by combining the characters in the first two strings. The first two strings can be mixed arbitrarily, but each must stay in its original order.

For example, consider forming "tcræete" from "cat" and "tree":

- String A: cat
- String B: tree
- String C: tcræete

As you can see, we can form the third string by alternating characters from the two strings. As a second example, consider forming "catrtee" from "cat" and "tree":

- String A: cat
- String B: tree
- String C: catrtee

Finally, notice that it is impossible to form "cttaree" from "cat" and "tree".

Input

The line of input consists of three strings, separated by a single space. All strings are composed of lower case letters only. The length of the third string is always the sum of the lengths of the first two strings. The first two strings will have lengths between 1 and 200 characters, inclusive.

Output

Print:

- Data set n: yes (if the third string can be formed from the first two)
- Data set n: no (if it cannot)

Sample Input

```
cat tree tcræete  
cat tree cttaree
```

Sample Output

```
Data set 1: yes  
Data set 2: no
```


Eligibility

- 1) Individuals or teams from the following categories are allowed:
 - a. Students/research scholars of authorised institutions (Students have to Show their Valid College ID).
 - b. Early stage startups OR upto 3 years old college passouts.
- 2) A team is allowed to have maximum 4 members.
- 3) If the participating team feels that their idea requires more participants in their team, they can forward their request, with suitable reasons, to digitalization@techfest.org with the subject "Ideate: Team number increase request".

Registration and Submission

The Participants have to register on the official Techfest Website and fill all the necessary details: www.techfest.org > Ideate > Explore More > digitalize > Register.

Abstract Submission:

Teams will be required to submit one report to digitalize@techfest.org. This report should contain the idea they are looking forward to work on.

Abstract Format

1. Title
2. Sectors
3. Background and Research:
 - a. Present methods of tackling the problem (if any)
 - b. Limitations of present solutions.
 - c. Alternate approaches
 - d. Proposed Solution
 - e. Novelty of Approach: How is or will be your solution better than existing products and overcome previous limitations?
4. Problems it solves and its Beneficiaries
5. Plan (with timeline) and current status
6. Technical Details:
 - a. Technical aspect of the proposed solution.
 - b. Detailed technical specifications and Pictorial representations (block diagrams/ flow chart).
 - c. Description of the flow of operations demonstrating key features and functionality.
 - d. Performance estimate of the solution.
 - e. Experimentation done to establish the workability of the above.
7. A link of the Google Drive Folder which contains Pictures and Video of the working model/ prototype.

8. Results

- a. Actual findings, significant output of tests and analysis (Must be readable)
- b. Include problems encountered, credibility of results, accuracy estimates
- c. Pros and cons of your solution
- d. Utility of results

9. Future prospects and research in it and further development (in brief)

10. Any other Details: (Patent/ Business plan etc.)

Submission Format:

The project report should be emailed to digitalize@techfest.org with the subject Ideate: Digitalize Project Report: Team Id (For example Ideate: Digitalize: DT1234). Teams must follow the following details for the submission:

1. The abstract must be submitted in pdf format only
2. Font: Arial
3. Size: 11
4. Spacing between two lines: 6 pts
5. Spacing between two paragraphs: 10 pts
6. Bottom margin: 1 inch

EVALUATION

1. Creativity and novelty : How novel is the idea? How different is it from the current solutions available? The innovation must be ingenious and novel in its area of application and should have a high potential for leaving an impact on the society.
2. Originality: The innovation should not, by any means, be or include copied or stolen work, such applications will be disqualified immediately.
3. Performance
4. Cost/Market Value and Acceptance
5. Durability and Usability: Durability of the prototype/method proposed.
6. Implementation ability: Is the solution implementable as described? Is it repeatable? Is the solution feasible for diverse and changing conditions?
7. Scalability: Does the solution is scalable to a higher level, how easy is to scale up and what are the factors affecting it
8. Potential of Impact : How does it benefit society? The Scale of problem it solves, Intensity of the solution and number of people catered from the solution directly and indirectly.
9. Design: has the design been considered? How optimized is the product?
10. Ergonomics (if the team decides to make a well-designed product)

In case of any discrepancies, the decision of the organizers or Judges will final and binding on all.

SHORTLISTING

Top 20 teams will be selected and would get the chance to present their model/idea in the Final Round at Techfest, IIT Bombay which is from 29th-31st December, 2017. Participants will get a slot for presenting their model/idea to the Judges based on which they will be evaluated.

General Rules

1. All projects being displayed will have a fair chance of receiving further development opportunities offered by funding organizations and Venture capitalists.
2. Every team has to register online on our website for the competition. A Team ID will be allocated to the team on registration which shall be used for future references.
3. A team can register at any point of time before 20th November 2017 and can submit final abstract and video (as mentioned in the structure).
4. The decision of the organizers or judges shall be treated as final and binding on all. Techfest has all the rights to verify the identity and accuracy of the details provided by the participants.
5. No responsibility will be held by Techfest, IIT Bombay for any late, lost or misdirected entries.
6. The idea presented by the teams should be original (not protected by means of patent/copyright/technical publication by anyone).
7. Note that at any point of time the latest information will be that which is on the website. However, registered participants will be informed through mail about any changes on the Website.
8. All mode of official communication will be through the techfest e-mail.

International Participants

All international participants will have to register before 9 th November 2017, and will have to submit the complete report along with video prototype before 9 th November 2017. The shortlisted international teams' details will be put up on the website by 27th November 2017.

Certificate policy

Only those teams that are shortlisted for the finals and also give a final presentation about their work during Techfest 2017-18 would be awarded a Certificate of Participation. The top entries from this event would be provided with Certificate of Excellence.

Timeline

First Project Report Submission	19th September 2017	Submission of First Draft Report
Mentorship Stage	25th September to 24th October 2017	Mentors will be allocated for the guidance of the participants.
Last Date of Registration	9th November 2017	Participants need to register before this date.
Final Project Report Submission	9th November 2017	Submission of final project report along with video prototype (if any) has to be submitted before this date.
Declaration of Result	27th November 2017	Declaration of shortlisted teams for final presentation at Techfest, IIT Bombay on the basis of final report and the supporting materials.
Improvisation Stage	27th November to 14th December 2017	Shortlisted participants are to improve upon their model and prepare a presentation for the final round.
Final Presentation and Video submission	15th December 2017	Participants have to submit the final video of prototype and presentation to be displayed during the festival before this date.
Presentation Stage	29th-31st December 2017	Final presentation along with demonstration of working prototype.