Python Hack-a-Thon on MIDAS Solutions

Join **VIT Vellore** and **MIDAS**

in a Python Hack-a-Thon, an initiative by
School of Civil Engineering,
School of Architecture &
School of Computer Science and Engineering.

Tackle real-world bridge design challenges and showcase your coding skills!

INSTITUTION'S INNOVATION COUNCIL
(Ministry of Education Initiative)

Mark Your Calendars!

Hack-a-Thon Dates: *8th November 2024, 6:00 PM – 10th November 2024, 2:00 PM*

About VIT

Vellore Institute of Technology (VIT) was founded with the intention of offering superior higher education on par with global norms. It consistently looks for and employs novel approaches to raise the standard of higher education. It was formed in 1984 as a self-supporting institution called the Vellore Engineering College and was done so in accordance with Section 3 of the University Grants Commission (UGC) Act, 1956. Vellore Engineering College received university status from the Union Ministry of Human Resources Development in 2001. Dr. G. Viswanathan, the University's Founder and Chancellor, previously served as a member of parliament and a minister in the Tamil Nadu government. Four branch campuses of the Vellore Institute of Technology are located in Vellore, Chennai, Andhra Pradesh, and Bhopal. For more detail, visit https://vit.ac.in/

VIT
Celebrating 40 years of Excellence

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MIDAS: Engineering Excellence

MIDAS is a globally renowned software suite designed to tackle some of the most complex challenges in civil engineering, particularly in bridge design. It has been the foundation behind iconic structures like the Burj Khalifa and numerous landmark bridges across the world. **Images of a few renowned structures designed with MIDAS are featured here.**

Empowering Engineering with Python APIs

The MIDAS Python API unlocks automation, customisation, and advanced analysis in structural design. Like banking and insurance, engineering holds immense potential for digital transformation in the AI and LLM era, enabling automation, complex geometry generation, and design optimisation.

"Engineering is the next frontier where AI-driven solutions can revolutionise the field, and MIDAS is at the forefront of this exciting transformation."

Russky Island Bridge

Burj khalifa

Master Python with MIDAS

Think Python is just for basic scripts? Think again! In this Hack-a-Thon, you'll explore how Python powers real-world civil engineering designs with MIDAS.

Welcome to the perfect challenge to push your Python skills beyond the ordinary! Dive into advanced applications that blend programming with structural design, and discover how Python can be a game changer in real-world engineering. Just bring your curiosity and coding prowess—everything else is ready for you to conquer!

Plan, Compete, and Grow

Participating in this Hack-a-Thon is your chance to learn advanced Python features with practical applications, no matter your current skill level. Whether you're just starting with coding or already proficient, you'll have the opportunity to collaborate and get ahead in both civil and computer engineering.

Rest assured, all the tools, training, and support you need to succeed will be provided, along with exposure to exciting new domains in engineering.

Pre-requisite for the Hack-a-Thon

To make the most of this Hack-a-Thon, participants should have a basic understanding of Python. Here are the essential topics you should be familiar with:

- **Basic Python Syntax**: Variables, data types, operators, control structures (if-else, loops), and functions.
- **Data Structures**: Using lists, dictionaries, tuples, and sets to manage and store data effectively.
- **File Handling**: Reading from and writing to files for importing and exporting data, especially in MIDAS workflows.
- **Numerical Computation**: Basic operations using libraries like NumPy for handling MIDAS-related data efficiently.
- **Python Libraries**: Installing and importing libraries, managing dependencies, and interacting with the MIDAS API.
- **Scripting**: Automating repetitive tasks like model setup and analysis runs using Python scripts.
- **MIDAS API**: Familiarity with how the Python API maps to MIDAS software, including handling exceptions and logging errors for debugging.

No prior deep knowledge of Object-Oriented Programming (OOP) is required, though a basic understanding of functions and modular programming will be helpful.

A Few MIDAS Users

Eligibility Criteria

This Hack-a-Thon is open to **all UG and PG first-year Students admitted to VIT Vellore in 2024.** This hack-a-thon is designed for enthusiastic students eager to explore the intersection of programming and engineering.

Teams of **three students** can collaborate on exciting challenges, and participants can form teams with freshers from any degree program. For example, a team may consist of B.Tech students from different streams, along with M.Tech or M.Arch students, or any other discipline. Please note that teams are limited to a maximum of **three members**.

Hack-a-Thon Flow!

1. Pay the registration fee of **Rs 1,000.00** (Inclusive of GST) at the registration link.
   Note: *Registration Fee is for a team of* **THREE** *members.*
2. Gain access to the MIDAS license and the training material and familiarise yourself with Python APIs.
3. Participate in the team Shortlisting Quiz.
4. Successful teams solve the series of challenges provided.
5. Winners will be honoured.

The timeline is given below:

Important Dates

Team Registration	: **20 - 24** Sept 2024
Training Release	: 25 Sept 2024
Team Shortlisting	: 06 Nov 2024
Problem Statement:	: 08 Nov 2024, 6:00 PM
Hack-a-Thon	: 08 Nov 2024, 6:00 PM – 10 Nov 2024, 2:00 PM
Judging & Results	: 10 Nov 2024, 2:00 PM – 5:30 PM

Hack-a-Thon's Focus

- **Process Automation**
- **Data Visualisation**
- **API Integration**
- **Performance Monitoring**
- **User Experience Enhancement**
- **Collaboration Tools**
- **Machine Learning Applications**

Competition Structure

The hack-a-thon will consist of multiple rounds, each designed to challenge participants and evaluate their skills. Progression through the rounds will be based on performance against the outlined criteria. A clear winner will be decided after assessing submissions across all rounds.

Participants will begin with a *filtering round* by way of MCQs, where proficiency in Python and the MIDAS Python API must be demonstrated. This initial assessment will ensure that all teams possess the necessary skills for effective engagement in subsequent challenges.

To support participants, periodic byte-sized tutorials and MCQs will be designed to enhance understanding throughout the event. Usage of the MIDAS software will be monitored to ensure effective application.

Team-building activities will also play a crucial role in the hack-a-thon. Teams are encouraged to:

- Choose a name for their team and share the team members' names.
- Maintain photos or video evidence of working together and create videos or slideshows.
- Maintain role clarity throughout the hack-a-thon.
- Engage in individual and collaborative learning.

Prize Categories

Categories
Prizes will be awarded in the following three categories:

Most Data-Rich Interpretation and Automation
- Criteria include the ability to effectively interpret data and automate processes within MIDAS.

Best Technical Implementation
- Criteria focus on code quality, effective use of Python and MIDAS features, and performance efficiency.

Best Team Collaboration
- Criteria assess clear roles, teamwork evidence, and the involvement of civil or architectural students in technical decisions.

Note: The competition is the same for all teams. Involvement by civil or architectural students is considered advantageous in all categories.

Judging Criteria

All projects will be evaluated based on the following specific criteria:

Most Data-Rich Interpretation and Automation (Total: 50 points)
Data Interpretation (20 points): Clarity and effectiveness in interpreting and presenting data relevant to the problem.

Automation (20 points): Level of automation achieved in the processes within MIDAS.

Innovation (10 points): Originality and creativity in the approach taken.

Judging Criteria (Contd...)

Best Technical Implementation (Total: 50 points)
Code Quality (20 points): Clarity, structure, and adherence to coding standards in the submitted code.

Effective Use of Tools (20 points): Appropriate and efficient use of Python and MIDAS features in the solution.

Performance Efficiency (10 points): Speed and resource usage of the implemented solution.

Best Team Collaboration (Total: 50 points)
Role Clarity (20 points): Well-defined roles and responsibilities among team members.

Teamwork Evidence (20 points): Demonstration of effective collaboration and communication throughout the project.

Diverse Group Contribution (10 points): Active involvement of team members from different disciplines, showcasing varied perspectives in decision-making.

Note: *The competition is the same for all teams. Involvement by civil or architectural students is considered advantageous in all categories.*

Tie-Breaker Clause
In the event of a tie in total scores, the winner will be determined by the effective use of MIDAS software (measured in hours), participation in pre-hack-a-thon events, and the overall quality of the project presentation and demonstration. The judges' criteria are final, with no liability from MIDAS or requirement to justify decisions.

Participant Guidelines

Rules and Regulations

- Teams shall have THREE members. Participants must develop an understanding of Python and the MIDAS software API.
- The license issued must be installed and demonstrated during the event.
- Participants must use the secured Wi-Fi provided at the venue.
- All team members are required to be present for the entire duration of the event.
- Teams should exhibit effective time management, team spirit, and technical prowess.
- All participants must adhere to the honour code throughout the event.

Honour Code

Participants are expected to uphold integrity and fairness by conducting themselves honestly throughout the event. Collaboration within teams is encouraged, but seeking external assistance is prohibited. Respect for the ideas and contributions of others is essential, and each participant is accountable for their own work, ensuring that all contributions are original and properly attributed.

Participation Benefits

All participants will Receive:

- 100 days of MIDAS Civil Software Access
- 1 Year Access to MIDAS Academy
- Access to AICTE-MIDAS Virtual Internship Program
- Certificates from MIDAS.

Qualification for VIT MIDAS Hack-a-Thon 2025

Prizes & Opportunities

- **Cash Prizes**: Attractive cash rewards for the top-performing teams.

  Prizes Worth
  ## INR 60,000.00

- **Special Mentions**: Standout teams will receive special mentions and recognition.
- **Publicity**: Successful winners will be featured on the official **MIDAS website**, showcasing their innovative solutions.
- **Paid Internships**: Get the opportunity for paid internships at **MIDAS** and other leading organisations in the industry.
- **Student Ambassadorship**: Exceptional participants may be offered student ambassadorship roles to represent **MIDAS**.

Registration Link

https://events.vit.ac.in/
Register and login on the registration link and look for the event title 'Python Hack-a-Thon on MIDAS Solutions.'

Contact Details

You can contact the VIT organising team for help on the email ID
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Mentorship and Hack-a-Thon Pivot, MIDAS

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