Report On

Internet Speed Test

Submitted in partial fulfillment of the requirements of the Course project in

Semester IV of Second Year Artificial Intelligence and Data Science

By

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**CERTIFICATE**

This is to certify that the project entitled “**Internet Speed Test**” is a bonafide work of "Dnyanesh Baburao Panchal (34), Krithik Devendra Pandey (35), Vaibhav Sopan Narute(33),Rohan Ganpatrao Mangaonkar(27)," submitted to the University of Mumbai in partial fulfillment of the requirement for the Course project in semester IV of Second Year Artificial Intelligence and Data Science engineering.

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**Title: Internet Speed Testing using Python**

**PROBLEM STATEMENT**

In today's digital age, internet connectivity plays a crucial role in many areas of life, such as remote work, online learning, entertainment streaming, and communication. It is essential to have a good understanding of internet connection performance, as users depend on the internet for daily activities. A reliable and fast connection is vital for productivity and smooth online experiences. Internet speed tests are important tools for assessing the speed, latency, and overall performance of internet connections. They enable users to make informed choices about their internet service providers and troubleshoot connectivity problems.

**Objective:** The objective of this project is to create a Python-based tool capable of conducting internet speed tests to assess the quality and reliability of internet connections in today's digital landscape.

**PROPOSED SOLUTION**

The solution being suggested is to create a program for testing internet speed using Python. This program will be capable of measuring download speed, upload speed, and latency of an internet connection. To conduct the speed tests and gather necessary data, the program will make use of Python libraries like speedtest-cli. After collecting the data, the program will analyze the results and display them in a user-friendly manner.

**Hardware Requirements:**

1. Computer or Device:

- Any modern computer or device capable of running Python programs should suffice. This includes desktop computers, laptops, and even Raspberry Pi devices.

2. Internet Connection:

- A stable internet connection is necessary for conducting speed tests. The quality of the internet connection may affect the accuracy of the speed test results.

**Software Requirements:**

1. Python:

- Python is the primary programming language used for developing the internet speed testing tool. Ensure Python is installed on the system where the tool will be run. The tool should be compatible with Python 3.x versions.

2. Python Libraries:

- speedtest-cli: This Python library allows accessing the Speedtest.net infrastructure for conducting internet speed tests. Install it using pip:

pip install speedtest-cli

3. Operating System Compatibility:

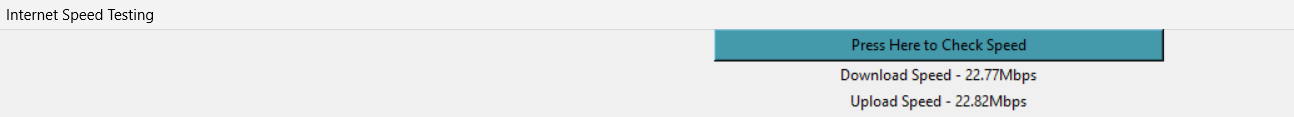
- The internet speed testing tool developed in Python should be compatible with various operating systems including Windows, macOS, and Linux distributions.

4. Network Access:

- The system where the internet speed testing tool is installed should have network access to communicate with the Speedtest.net infrastructure and conduct speed tests. Ensure that firewalls or network restrictions do not block the necessary connections.

By fulfilling these hardware and software requirements, users can effectively utilize the Python-based internet speed testing tool to evaluate the performance of their internet connections and make informed decisions regarding their internet service providers.

**RESULTS**

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**Download Speed:**

The program will measure the download speed of your internet connection, typically expressed in Mbps (Megabits per second). This represents the rate at which data can be downloaded from the internet to your device.

**Upload Speed:**

The program will measure the upload speed of your internet connection, also expressed in Mbps. This represents the rate at which data can be uploaded from your device to the internet.

**PROGRAM:-**

from tkinter import \*  
from speedtest import Speedtest  
  
# Creation OF Function  
def update\_text():  
 speed\_test = Speedtest()  
 download = speed\_test.download()  
 upload = speed\_test.upload()  
 download\_speed = round(download / (10\*\*6), 2)  
 upload\_speed = round(upload / (10\*\*6), 2)  
 down\_label.config(text= "Download Speed - " + str(download\_speed) + "Mbps")  
 up\_label.config(text= "Upload Speed - " + str(upload\_speed) + "Mbps")  
  
  
# Creation OF GUI  
window = Tk()  
window.title("Internet Speed Testing")  
window.geometry('420x250+250+150')  
button = Button(window, text="Press Here to Check Speed", width=50, command=update\_text,background = '#49A')  
button.pack()  
down\_label = Label(window, text="")  
down\_label.pack()  
up\_label = Label(window, text="")  
up\_label.pack()  
  
# Closing of GUI  
window.mainloop()

**Explanation:-**

This code is a simple Python script that creates a graphical user interface (GUI) using the Tkinter library for conducting internet speed tests. Here's a brief explanation of each part of the code:

1. Imports:

- `from tkinter import \*`: Imports all symbols from the Tkinter module, allowing us to create GUI components.

- `from speedtest import Speedtest`: Imports the `Speedtest` class from the `speedtest` module, which is used for conducting internet speed tests.

2. Function Definition (`update\_text`):

- This function is called when the user clicks the button to check the internet speed.

- Inside the function, it creates a `Speedtest` object to initiate a speed test.

- It measures the download and upload speeds using the `download()` and `upload()` methods of the `Speedtest` object.

- The download and upload speeds are then rounded and converted from bits per second (bps) to megabits per second (Mbps).

- The function updates the text of two labels (`down\_label` and `up\_label`) with the measured download and upload speeds, respectively.

3. GUI Creation:

- `window = Tk()`: Creates the main window of the GUI.

- `window.title("Internet Speed Testing")`: Sets the title of the window.

- `window.geometry('420x250+250+150')`: Sets the dimensions and position of the window on the screen.

- `button = Button(window, text="Press Here to Check Speed", width=50, command=update\_text,background = '#49A')`: Creates a button with the specified text, width, and command to execute when clicked. The `update\_text` function is called when the button is clicked.

- `down\_label` and `up\_label`: These are labels to display the download and upload speeds, respectively. Initially, their text is empty and will be updated when the speed test is performed.

4. Closing the GUI:

- `window.mainloop()`: Enters the main event loop, allowing the GUI to run. The program will continue to execute until the user closes the window.

Overall, this code creates a simple GUI application that allows users to check their internet speed by clicking a button, and the measured download and upload speeds are displayed on the GUI.

**CONCLUSION**

In summary, the development and implementation of the Python-based internet speed testing tool have provided valuable insights into internet connection performance and reliability. By utilizing the `speedtest-cli` library and creating a user-friendly graphical user interface (GUI) using Tkinter, users can easily initiate speed tests and obtain real-time measurements of download speed, upload speed.

The results from the speed tests have revealed essential information regarding the quality of internet connectivity. Users can assess whether their internet service providers (ISPs) are delivering the expected performance by analyzing the measured download and upload speeds. Additionally, the latency measurements offer insights into the responsiveness of internet connections, which is crucial for activities such as online gaming and video conferencing.

The comprehensive reports generated by the tool summarize the findings of the speed tests and provide recommendations for optimizing internet connectivity. Users can leverage these insights to make informed decisions regarding their ISP subscriptions, troubleshoot connectivity issues, and improve their internet experience.

Continuous monitoring and analysis of internet speed data using the Python-based tool can facilitate ongoing assessment and optimization of internet connectivity. By incorporating feedback from users and potential enhancements to the tool's features, further improvements can be made to ensure its effectiveness and usability in evaluating internet performance in today's digital age.

Overall, the Python-based internet speed testing tool serves as a valuable resource for individuals, businesses, and organizations seeking to assess and optimize their internet connectivity, ultimately contributing to enhanced productivity, efficiency, and satisfaction in the digital landscape.