Python Video Downloader - Developer Reference

1. Algorithm Overview

1. User inputs URL of the video.

2. Validate the URL.

3. Identify source (YouTube, Instagram, etc.)

4. Fetch video metadata (title, duration, available qualities).

5. Display available options to the user.

6. User selects quality/format.

7. Download video using source-specific library/API.

8. Save video locally.

9. Optionally allow resuming or multiple downloads.

2. Pseudocode

```
function download_video(url):
    if not validate_url(url):
        return 'Invalid URL'
    source = detect_source(url)
    metadata = fetch_metadata(source, url)
    display_options(metadata)
    choice = user_select_quality()
    video_data = download(source, url, choice)
    save_video(video_data)
    return 'Download Complete'
```
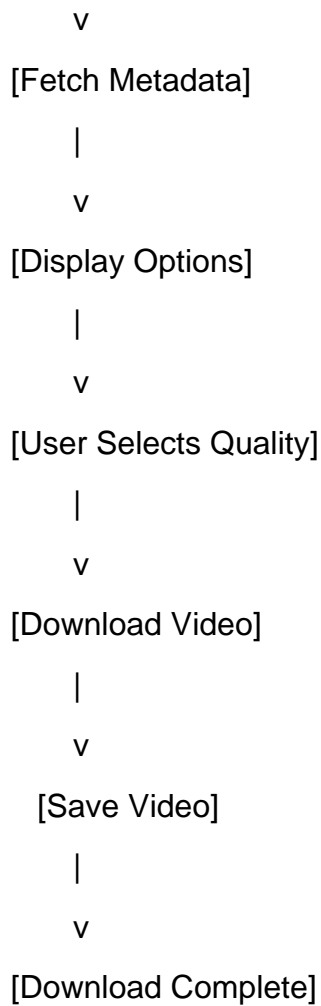
3. Flowchart (Conceptual)

```
[User Input URL] --> [Validate URL]
        |
        v
    [Detect Source]
        |
```

```
          v

    [Fetch Metadata]

        |

        v

    [Display Options]

        |

        v

    [User Selects Quality]

        |

        v

    [Download Video]

        |

        v

      [Save Video]

        |

        v

    [Download Complete]
```

4. Notes and References

- YouTube: pytube or yt_dlp libraries

- Instagram: instaloader or yt_dlp

- Other platforms: investigate source-specific APIs

- Handle errors, retries, and invalid URLs gracefully

- Can extend to choose formats (mp4, mp3) and quality