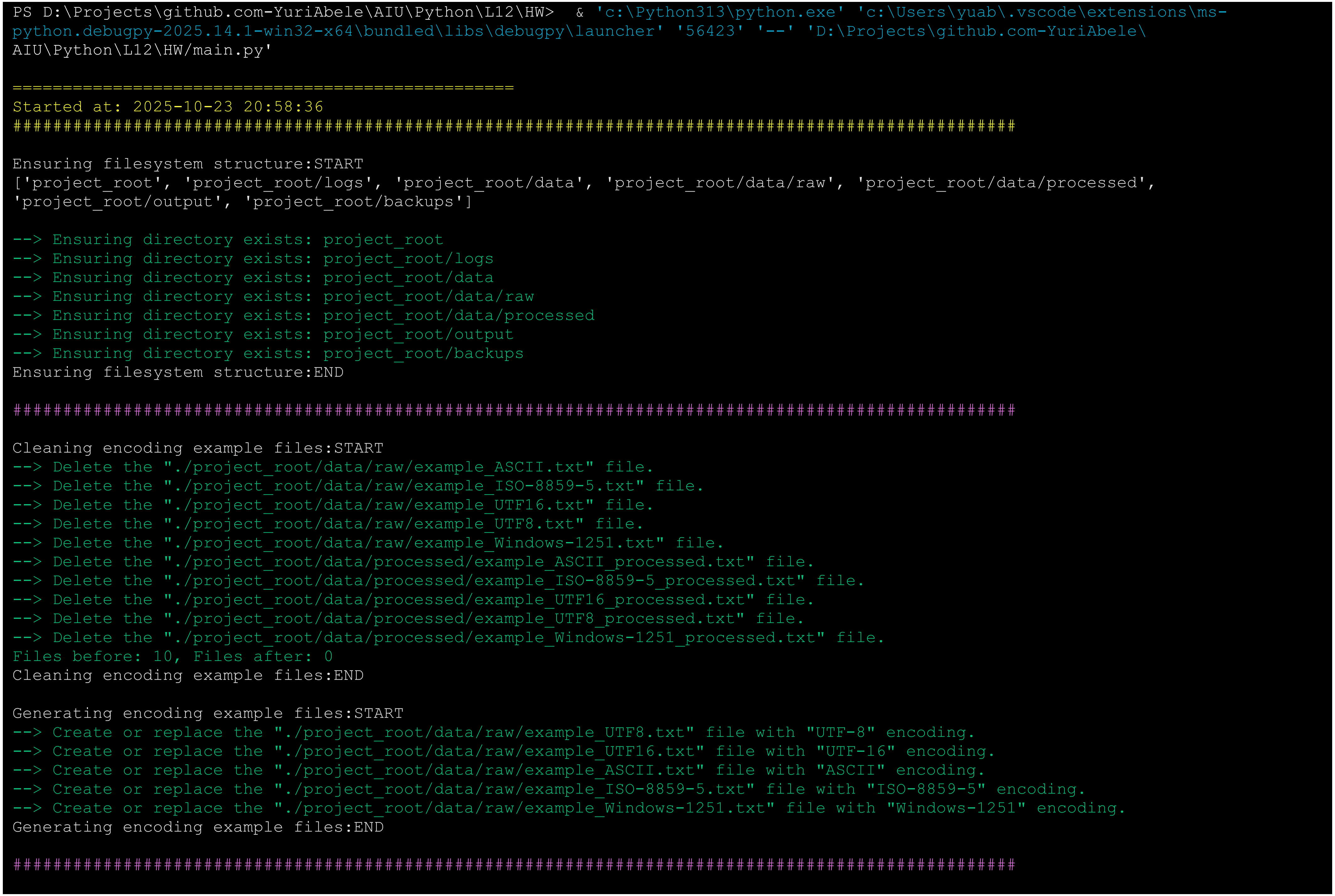
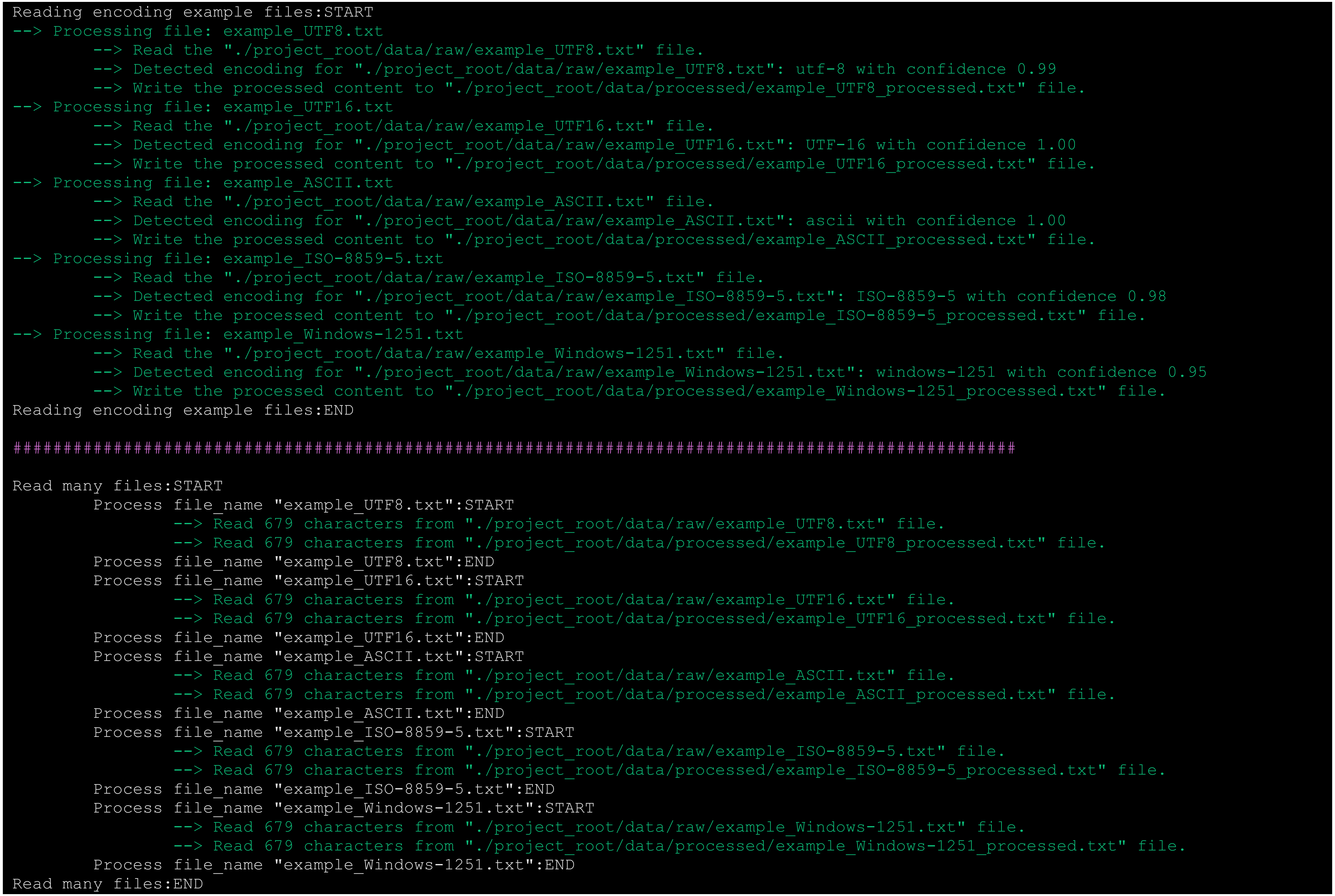
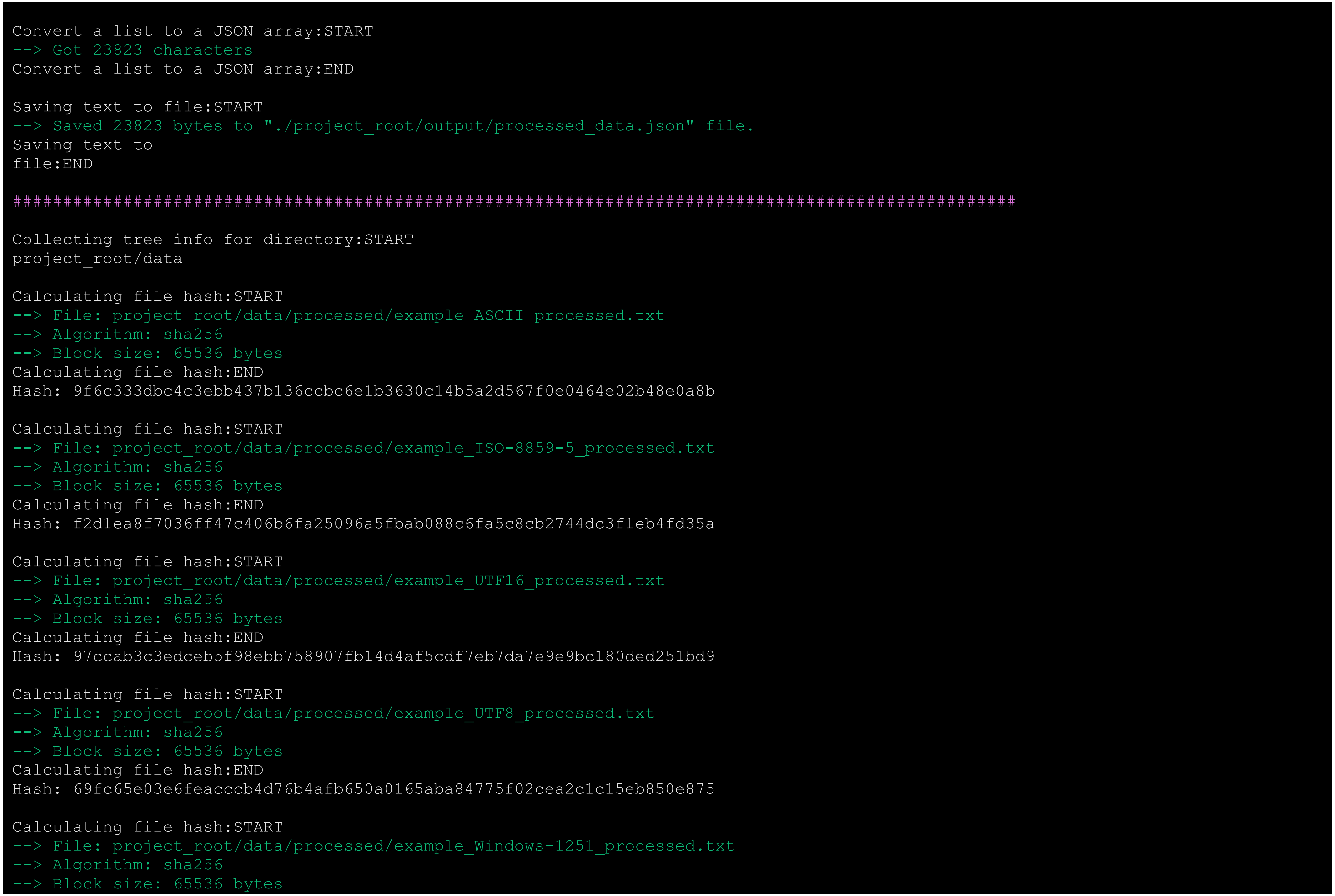


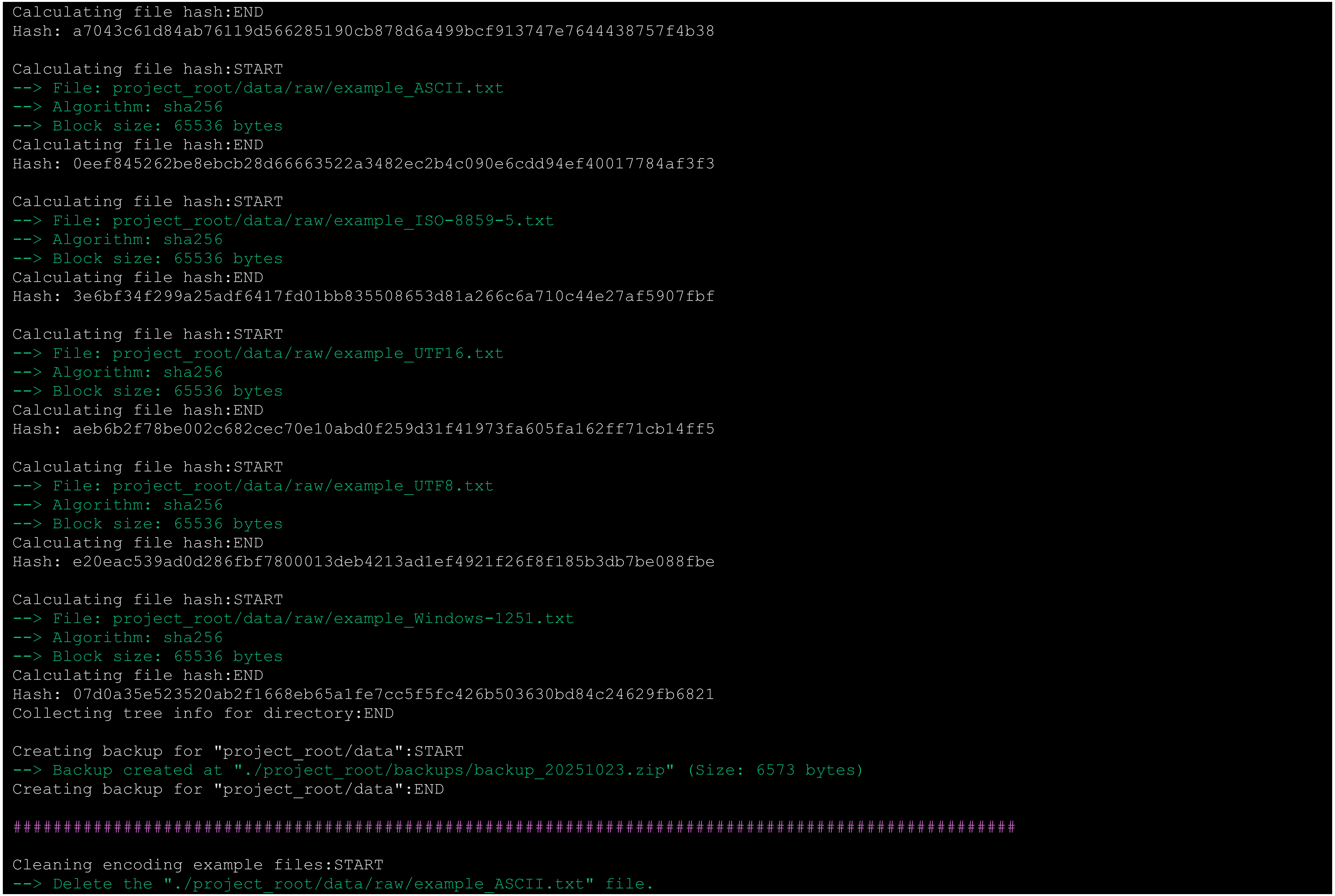
```
PS D:\Projects\github.com-YuriAbele\AIU\Python\L12\HW>  & 'c:\Python313\python.exe' 'c:\Users\yuab\.vscode\extensions\ms-
python.debugpy-2025.14.1-win32-x64\bundled\libs\debugpy\launcher' '56423' '--' 'D:\Projects\github.com-YuriAbele\
AIU\Python\L12\HW/main.py'

==================================================
Started at: 2025-10-23 20:58:36
####################################################################################################

Ensuring filesystem structure:START
['project_root', 'project_root/logs', 'project_root/data', 'project_root/data/raw', 'project_root/data/processed',
'project_root/output', 'project_root/backups']

--> Ensuring directory exists: project_root
--> Ensuring directory exists: project_root/logs
--> Ensuring directory exists: project_root/data
--> Ensuring directory exists: project_root/data/raw
--> Ensuring directory exists: project_root/data/processed
--> Ensuring directory exists: project_root/output
--> Ensuring directory exists: project_root/backups
Ensuring filesystem structure:END

####################################################################################################

Cleaning encoding example files:START
--> Delete the "./project_root/data/raw/example_ASCII.txt" file.
--> Delete the "./project_root/data/raw/example_ISO-8859-5.txt" file.
--> Delete the "./project_root/data/raw/example_UTF16.txt" file.
--> Delete the "./project_root/data/raw/example_UTF8.txt" file.
--> Delete the "./project_root/data/raw/example_Windows-1251.txt" file.
--> Delete the "./project_root/data/processed/example_ASCII_processed.txt" file.
--> Delete the "./project_root/data/processed/example_ISO-8859-5_processed.txt" file.
--> Delete the "./project_root/data/processed/example_UTF16_processed.txt" file.
--> Delete the "./project_root/data/processed/example_UTF8_processed.txt" file.
--> Delete the "./project_root/data/processed/example_Windows-1251_processed.txt" file.
Files before: 10, Files after: 0
Cleaning encoding example files:END

Generating encoding example files:START
--> Create or replace the "./project_root/data/raw/example_UTF8.txt" file with "UTF-8" encoding.
--> Create or replace the "./project_root/data/raw/example_UTF16.txt" file with "UTF-16" encoding.
--> Create or replace the "./project_root/data/raw/example_ASCII.txt" file with "ASCII" encoding.
--> Create or replace the "./project_root/data/raw/example_ISO-8859-5.txt" file with "ISO-8859-5" encoding.
--> Create or replace the "./project_root/data/raw/example_Windows-1251.txt" file with "Windows-1251" encoding.
Generating encoding example files:END

####################################################################################################
```



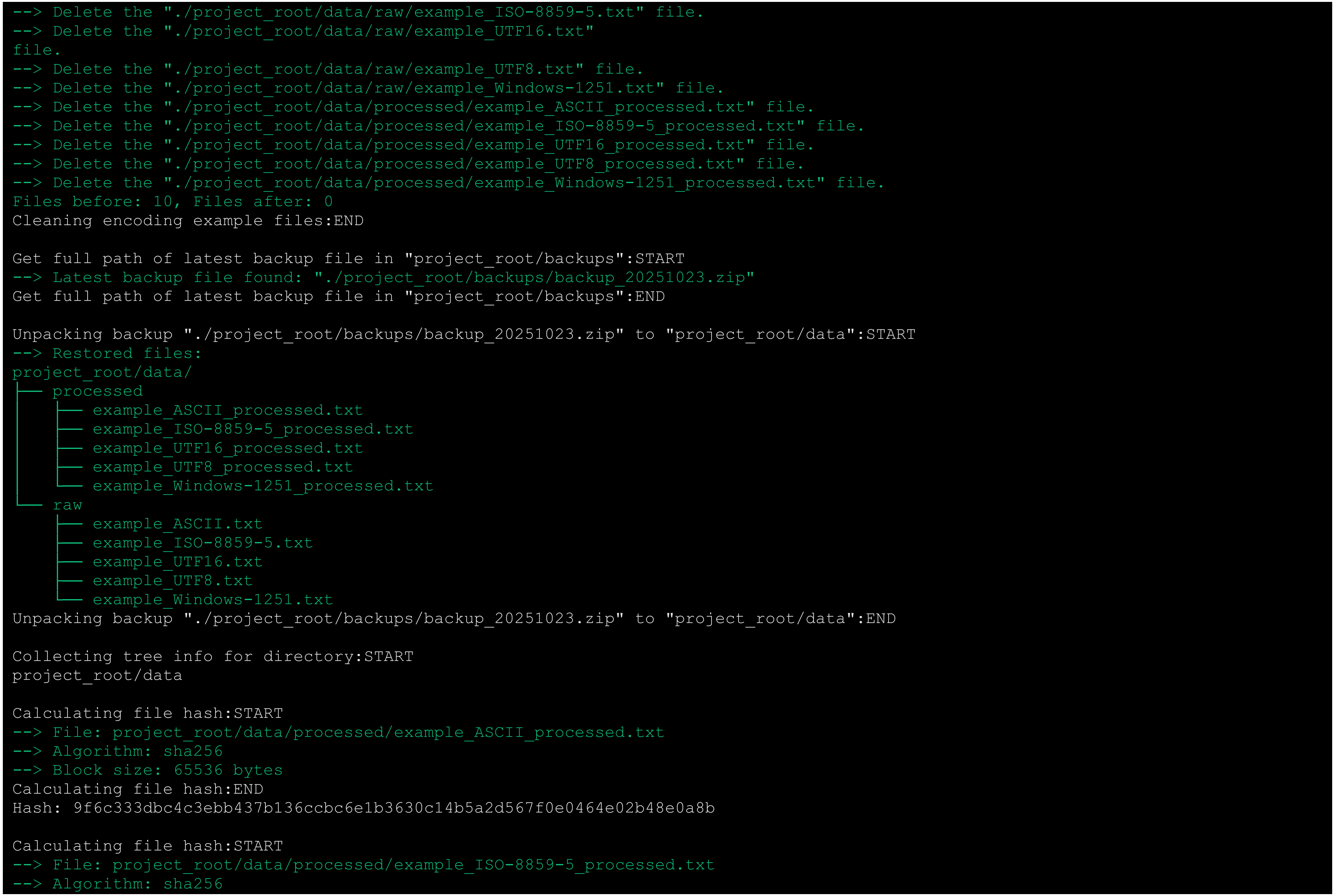
```
Reading encoding example files:START
--> Processing file: example_UTF8.txt
        --> Read the "./project_root/data/raw/example_UTF8.txt" file.
        --> Detected encoding for "./project_root/data/raw/example_UTF8.txt": utf-8 with confidence 0.99
        --> Write the processed content to "./project_root/data/processed/example_UTF8_processed.txt" file.
--> Processing file: example_UTF16.txt
        --> Read the "./project_root/data/raw/example_UTF16.txt" file.
        --> Detected encoding for "./project_root/data/raw/example_UTF16.txt": UTF-16 with confidence 1.00
        --> Write the processed content to "./project_root/data/processed/example_UTF16_processed.txt" file.
--> Processing file: example_ASCII.txt
        --> Read the "./project_root/data/raw/example_ASCII.txt" file.
        --> Detected encoding for "./project_root/data/raw/example_ASCII.txt": ascii with confidence 1.00
        --> Write the processed content to "./project_root/data/processed/example_ASCII_processed.txt" file.
--> Processing file: example_ISO-8859-5.txt
        --> Read the "./project_root/data/raw/example_ISO-8859-5.txt" file.
        --> Detected encoding for "./project_root/data/raw/example_ISO-8859-5.txt": ISO-8859-5 with confidence 0.98
        --> Write the processed content to "./project_root/data/processed/example_ISO-8859-5_processed.txt" file.
--> Processing file: example_Windows-1251.txt
        --> Read the "./project_root/data/raw/example_Windows-1251.txt" file.
        --> Detected encoding for "./project_root/data/raw/example_Windows-1251.txt": windows-1251 with confidence 0.95
        --> Write the processed content to "./project_root/data/processed/example_Windows-1251_processed.txt" file.
Reading encoding example files:END

####################################################################################################

Read many files:START
        Process file_name "example_UTF8.txt":START
                --> Read 679 characters from "./project_root/data/raw/example_UTF8.txt" file.
                --> Read 679 characters from "./project_root/data/processed/example_UTF8_processed.txt" file.
        Process file_name "example_UTF8.txt":END
        Process file_name "example_UTF16.txt":START
                --> Read 679 characters from "./project_root/data/raw/example_UTF16.txt" file.
                --> Read 679 characters from "./project_root/data/processed/example_UTF16_processed.txt" file.
        Process file_name "example_UTF16.txt":END
        Process file_name "example_ASCII.txt":START
                --> Read 679 characters from "./project_root/data/raw/example_ASCII.txt" file.
                --> Read 679 characters from "./project_root/data/processed/example_ASCII_processed.txt" file.
        Process file_name "example_ASCII.txt":END
        Process file_name "example_ISO-8859-5.txt":START
                --> Read 679 characters from "./project_root/data/raw/example_ISO-8859-5.txt" file.
                --> Read 679 characters from "./project_root/data/processed/example_ISO-8859-5_processed.txt" file.
        Process file_name "example_ISO-8859-5.txt":END
        Process file_name "example_Windows-1251.txt":START
                --> Read 679 characters from "./project_root/data/raw/example_Windows-1251.txt" file.
                --> Read 679 characters from "./project_root/data/processed/example_Windows-1251_processed.txt" file.
        Process file_name "example_Windows-1251.txt":END
Read many files:END
```



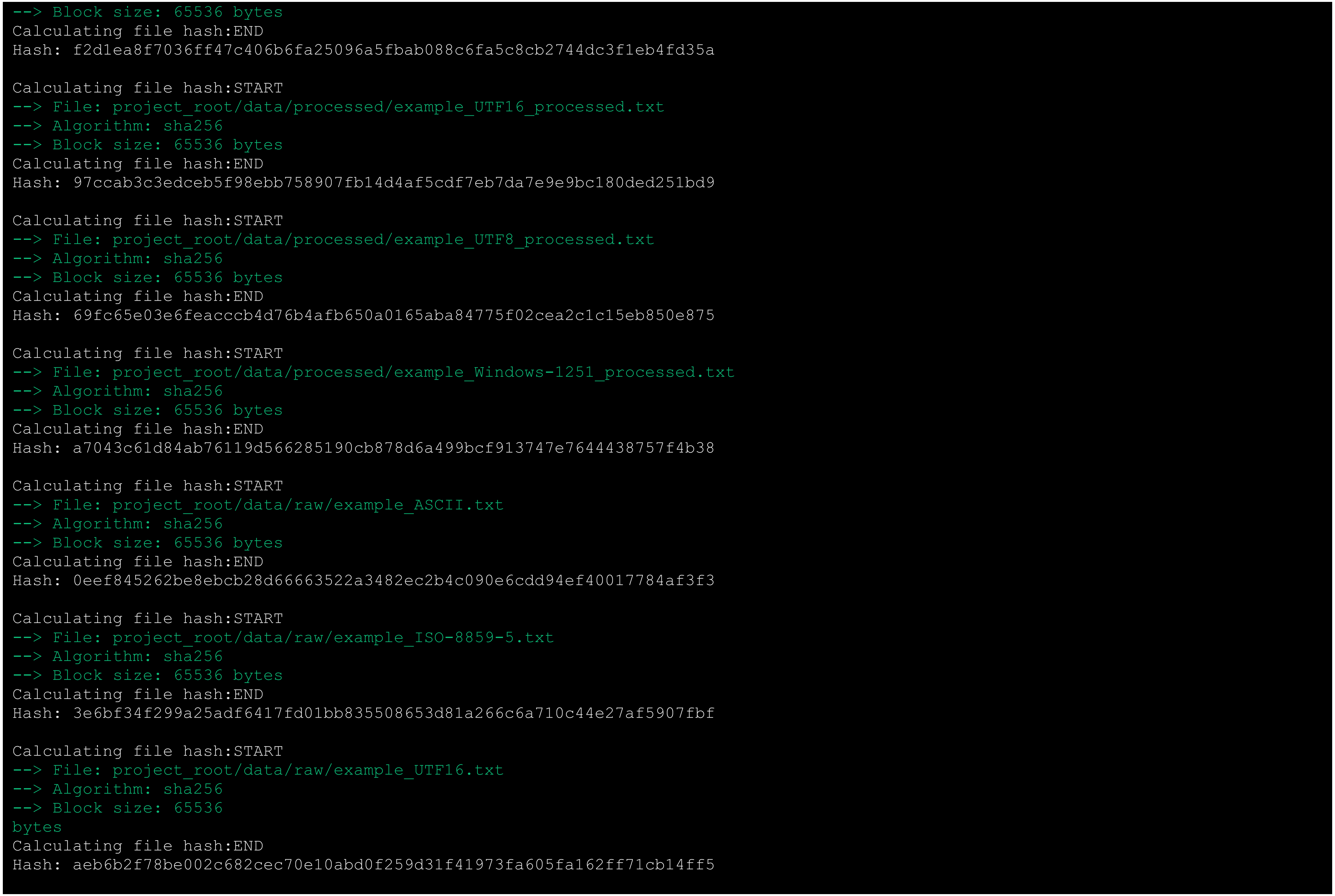
```
Convert a list to a JSON array:START
--> Got 23823 characters
Convert a list to a JSON array:END

Saving text to file:START
--> Saved 23823 bytes to "./project_root/output/processed_data.json" file.
Saving text to
file:END

####################################################################################################

Collecting tree info for directory:START
project_root/data

Calculating file hash:START
--> File: project_root/data/processed/example_ASCII_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 9f6c333dbc4c3ebb437b136ccbc6e1b3630c14b5a2d567f0e0464e02b48e0a8b

Calculating file hash:START
--> File: project_root/data/processed/example_ISO-8859-5_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: f2d1ea8f7036ff47c406b6fa25096a5fbab088c6fa5c8cb2744dc3f1eb4fd35a

Calculating file hash:START
--> File: project_root/data/processed/example_UTF16_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 97ccab3c3edceb5f98ebb758907fb14d4af5cdf7eb7da7e9e9bc180ded251bd9

Calculating file hash:START
--> File: project_root/data/processed/example_UTF8_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 69fc65e03e6feacccb4d76b4afb650a0165aba84775f02cea2c1c15eb850e875

Calculating file hash:START
--> File: project_root/data/processed/example_Windows-1251_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
```



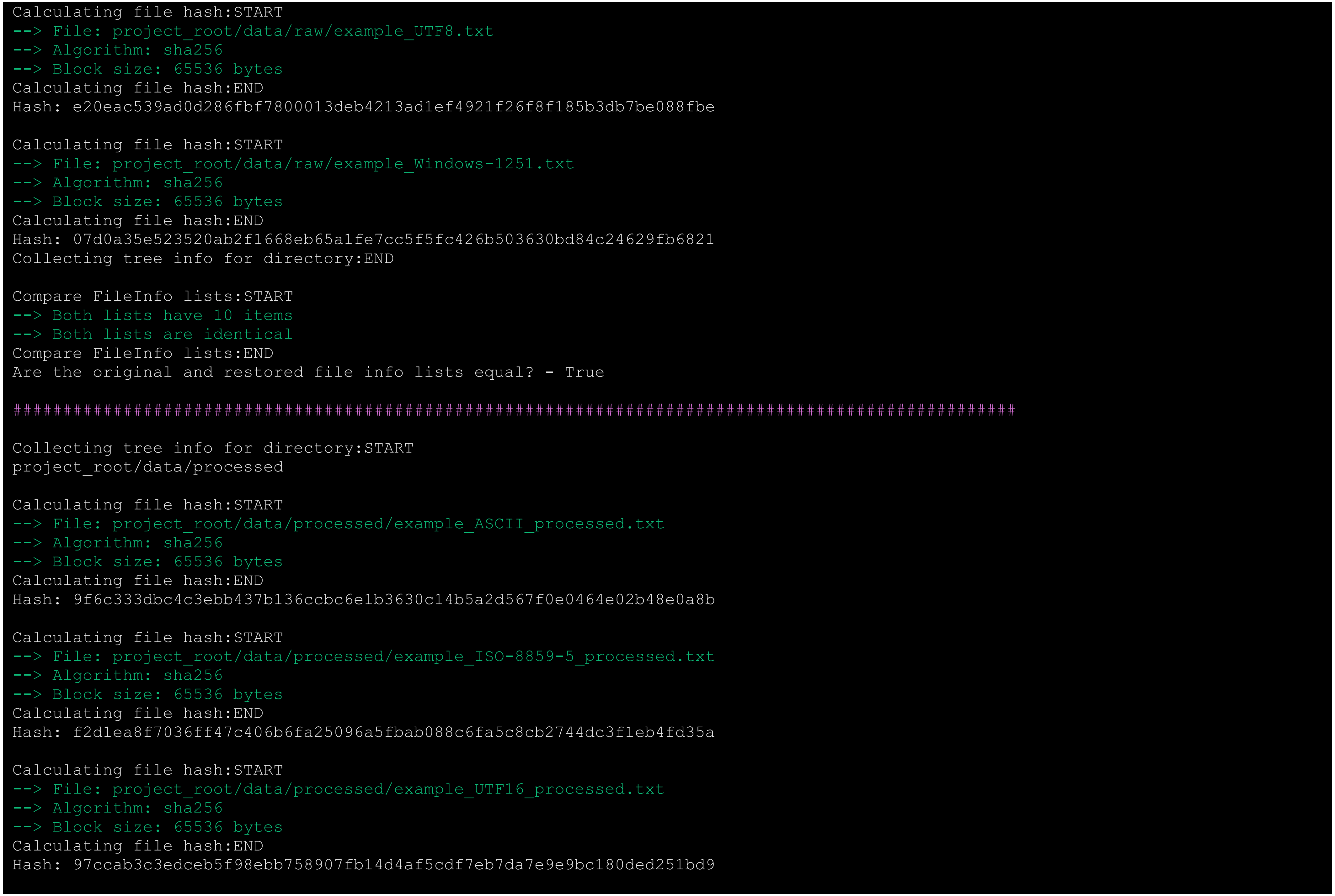
```
Calculating file hash:END
Hash: a7043c61d84ab76119d566285190cb878d6a499bcf913747e7644438757f4b38

Calculating file hash:START
--> File: project_root/data/raw/example_ASCII.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 0eef845262be8ebcb28d66663522a3482ec2b4c090e6cdd94ef40017784af3f3

Calculating file hash:START
--> File: project_root/data/raw/example_ISO-8859-5.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 3e6bf34f299a25adf6417fd01bb835508653d81a266c6a710c44e27af5907fbf

Calculating file hash:START
--> File: project_root/data/raw/example_UTF16.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: aeb6b2f78be002c682cec70e10abd0f259d31f41973fa605fa162ff71cb14ff5

Calculating file hash:START
--> File: project_root/data/raw/example_UTF8.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: e20eac539ad0d286fbf7800013deb4213ad1ef4921f26f8f185b3db7be088fbe

Calculating file hash:START
--> File: project_root/data/raw/example_Windows-1251.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 07d0a35e523520ab2f1668eb65a1fe7cc5f5fc426b503630bd84c24629fb6821
Collecting tree info for directory:END

Creating backup for "project_root/data":START
--> Backup created at "./project_root/backups/backup_20251023.zip" (Size: 6573 bytes)
Creating backup for "project_root/data":END

####################################################################################################

Cleaning encoding example files:START
--> Delete the "./project_root/data/raw/example_ASCII.txt" file.
```



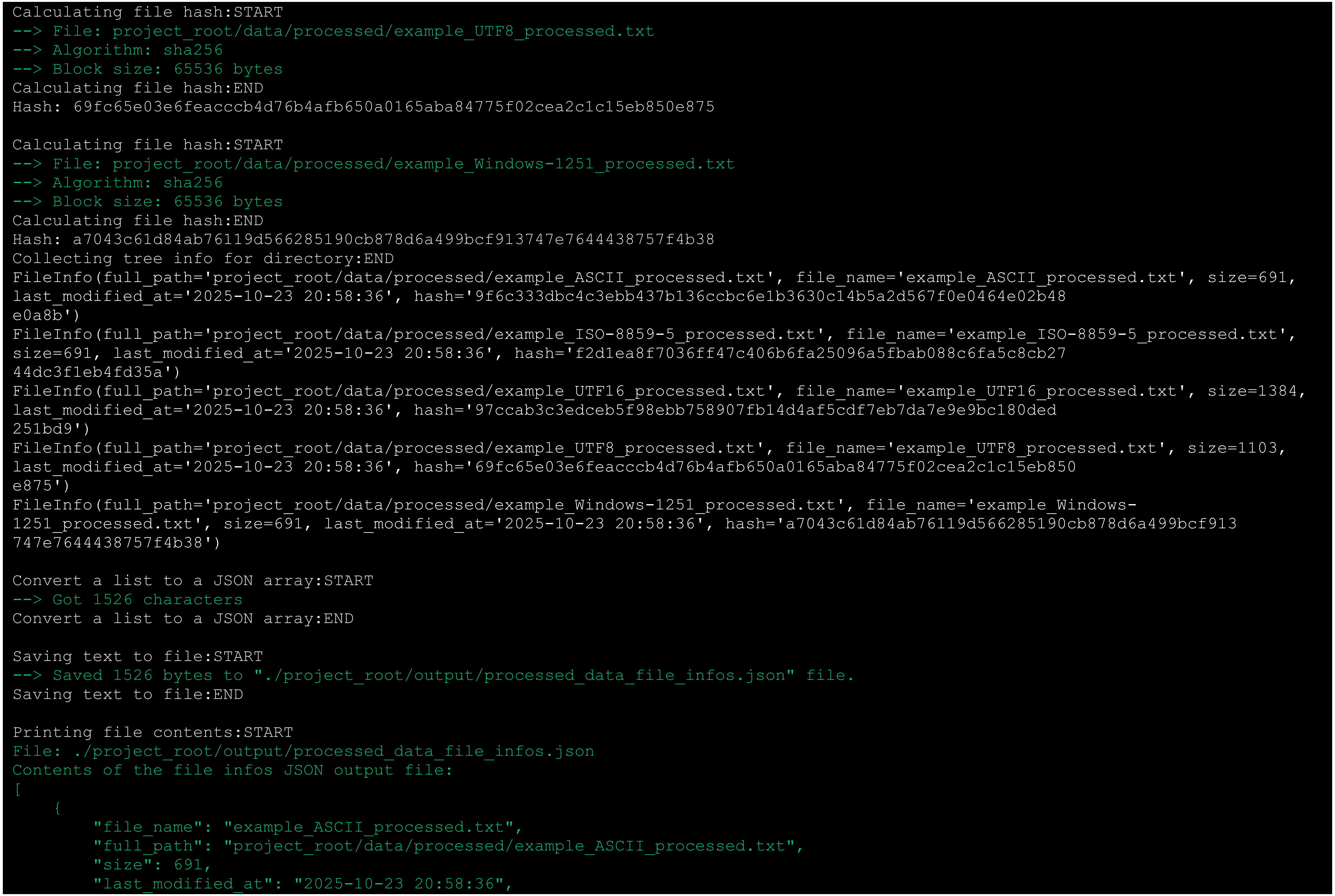
```
--> Delete the "./project_root/data/raw/example_ISO-8859-5.txt" file.
--> Delete the "./project_root/data/raw/example_UTF16.txt"
file.
--> Delete the "./project_root/data/raw/example_UTF8.txt" file.
--> Delete the "./project_root/data/raw/example_Windows-1251.txt" file.
--> Delete the "./project_root/data/processed/example_ASCII_processed.txt" file.
--> Delete the "./project_root/data/processed/example_ISO-8859-5_processed.txt" file.
--> Delete the "./project_root/data/processed/example_UTF16_processed.txt" file.
--> Delete the "./project_root/data/processed/example_UTF8_processed.txt" file.
--> Delete the "./project_root/data/processed/example_Windows-1251_processed.txt" file.
Files before: 10, Files after: 0
Cleaning encoding example files:END

Get full path of latest backup file in "project_root/backups":START
--> Latest backup file found: "./project_root/backups/backup_20251023.zip"
Get full path of latest backup file in "project_root/backups":END

Unpacking backup "./project_root/backups/backup_20251023.zip" to "project_root/data":START
--> Restored files:
project_root/data/
├── processed
│   ├── example_ASCII_processed.txt
│   ├── example_ISO-8859-5_processed.txt
│   ├── example_UTF16_processed.txt
│   ├── example_UTF8_processed.txt
│   └── example_Windows-1251_processed.txt
└── raw
    ├── example_ASCII.txt
    ├── example_ISO-8859-5.txt
    ├── example_UTF16.txt
    ├── example_UTF8.txt
    └── example_Windows-1251.txt
Unpacking backup "./project_root/backups/backup_20251023.zip" to "project_root/data":END

Collecting tree info for directory:START
project_root/data

Calculating file hash:START
--> File: project_root/data/processed/example_ASCII_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 9f6c333dbc4c3ebb437b136ccbc6e1b3630c14b5a2d567f0e0464e02b48e0a8b

Calculating file hash:START
--> File: project_root/data/processed/example_ISO-8859-5_processed.txt
--> Algorithm: sha256
```



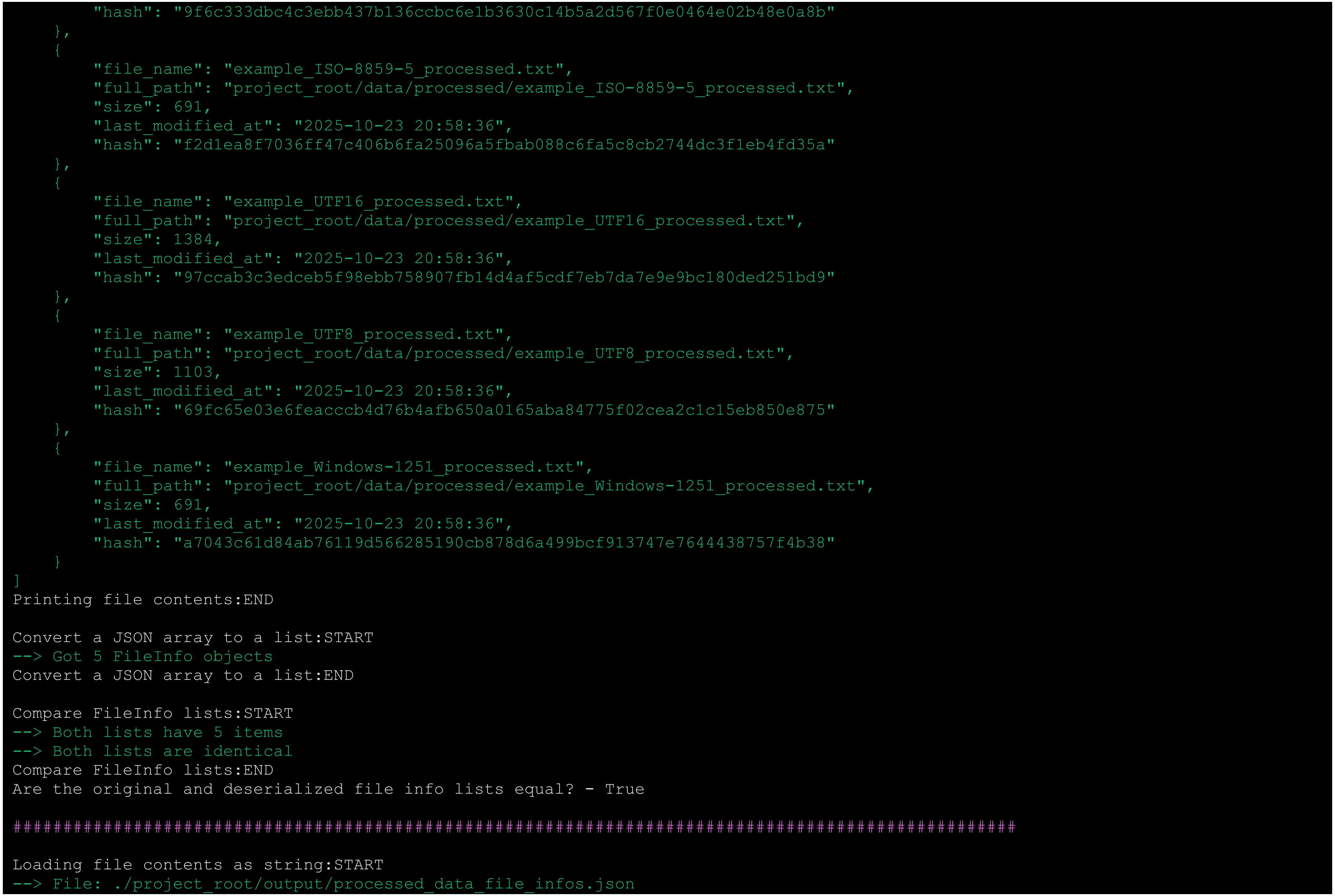
```
--> Block size: 65536 bytes
Calculating file hash:END
Hash: f2d1ea8f7036ff47c406b6fa25096a5fbab088c6fa5c8cb2744dc3f1eb4fd35a

Calculating file hash:START
--> File: project_root/data/processed/example_UTF16_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 97ccab3c3edceb5f98ebb758907fb14d4af5cdf7eb7da7e9e9bc180ded251bd9

Calculating file hash:START
--> File: project_root/data/processed/example_UTF8_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 69fc65e03e6feacccb4d76b4afb650a0165aba84775f02cea2c1c15eb850e875

Calculating file hash:START
--> File: project_root/data/processed/example_Windows-1251_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: a7043c61d84ab76119d566285190cb878d6a499bcf913747e7644438757f4b38

Calculating file hash:START
--> File: project_root/data/raw/example_ASCII.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 0eef845262be8ebcb28d66663522a3482ec2b4c090e6cdd94ef40017784af3f3

Calculating file hash:START
--> File: project_root/data/raw/example_ISO-8859-5.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 3e6bf34f299a25adf6417fd01bb835508653d81a266c6a710c44e27af5907fbf

Calculating file hash:START
--> File: project_root/data/raw/example_UTF16.txt
--> Algorithm: sha256
--> Block size: 65536
bytes
Calculating file hash:END
Hash: aeb6b2f78be002c682cec70e10abd0f259d31f41973fa605fa162ff71cb14ff5
```



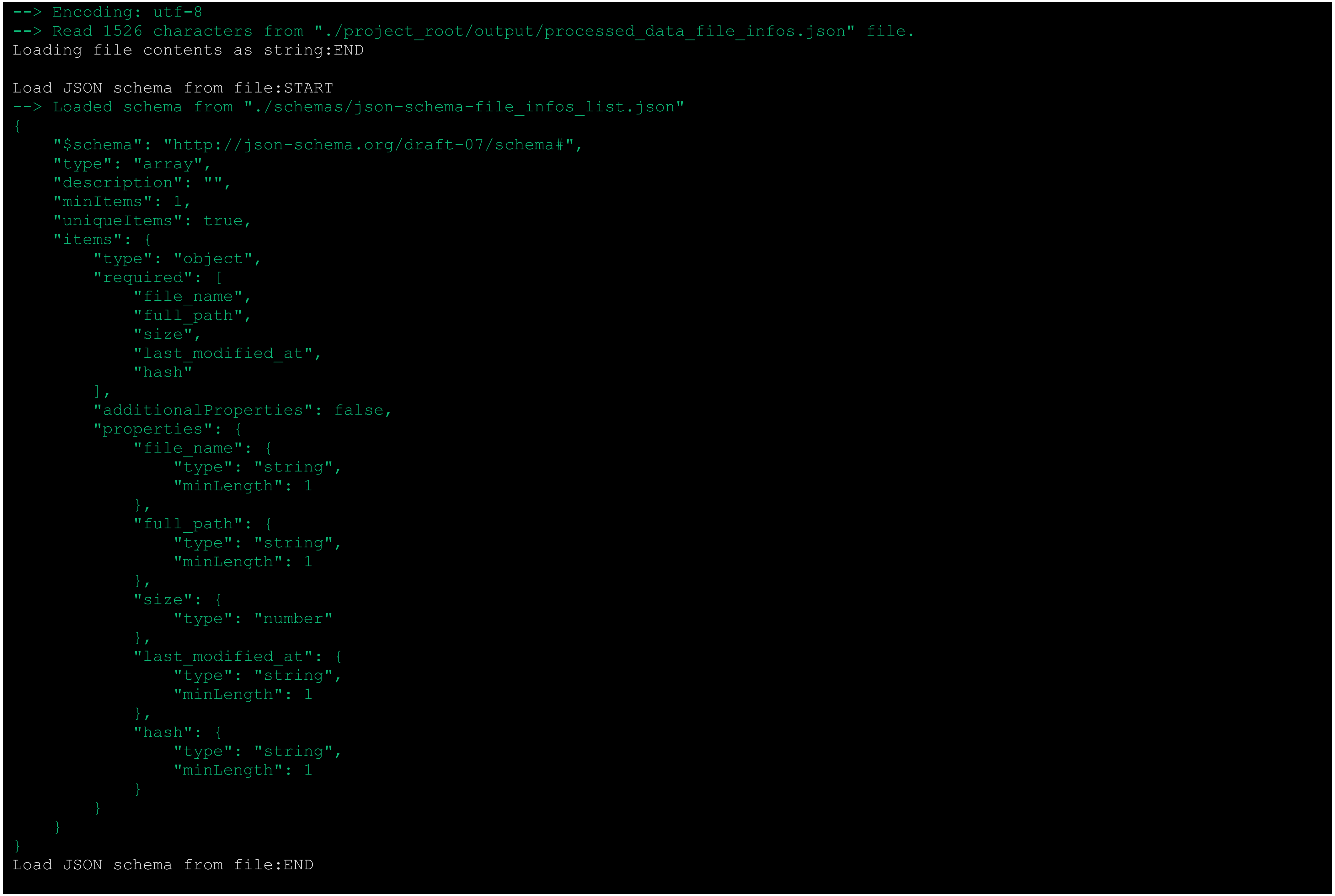
```
Calculating file hash:START
--> File: project_root/data/raw/example_UTF8.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: e20eac539ad0d286fbf7800013deb4213ad1ef4921f26f8f185b3db7be088fbe

Calculating file hash:START
--> File: project_root/data/raw/example_Windows-1251.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 07d0a35e523520ab2f1668eb65a1fe7cc5f5fc426b503630bd84c24629fb6821
Collecting tree info for directory:END

Compare FileInfo lists:START
--> Both lists have 10 items
--> Both lists are identical
Compare FileInfo lists:END
Are the original and restored file info lists equal? - True

####################################################################################################

Collecting tree info for directory:START
project_root/data/processed

Calculating file hash:START
--> File: project_root/data/processed/example_ASCII_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 9f6c333dbc4c3ebb437b136ccbc6e1b3630c14b5a2d567f0e0464e02b48e0a8b

Calculating file hash:START
--> File: project_root/data/processed/example_ISO-8859-5_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: f2d1ea8f7036ff47c406b6fa25096a5fbab088c6fa5c8cb2744dc3f1eb4fd35a

Calculating file hash:START
--> File: project_root/data/processed/example_UTF16_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 97ccab3c3edceb5f98ebb758907fb14d4af5cdf7eb7da7e9e9bc180ded251bd9
```



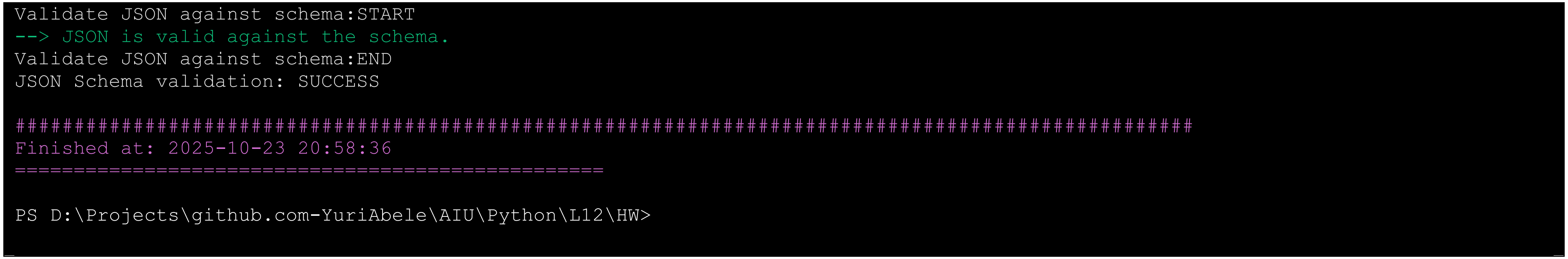
```
Calculating file hash:START
--> File: project_root/data/processed/example_UTF8_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: 69fc65e03e6feacccb4d76b4afb650a0165aba84775f02cea2c1c15eb850e875

Calculating file hash:START
--> File: project_root/data/processed/example_Windows-1251_processed.txt
--> Algorithm: sha256
--> Block size: 65536 bytes
Calculating file hash:END
Hash: a7043c61d84ab76119d566285190cb878d6a499bcf913747e7644438757f4b38
Collecting tree info for directory:END
FileInfo(full_path='project_root/data/processed/example_ASCII_processed.txt', file_name='example_ASCII_processed.txt', size=691,
last_modified_at='2025-10-23 20:58:36', hash='9f6c333dbc4c3ebb437b136ccbc6e1b3630c14b5a2d567f0e0464e02b48
e0a8b')
FileInfo(full_path='project_root/data/processed/example_ISO-8859-5_processed.txt', file_name='example_ISO-8859-5_processed.txt',
size=691, last_modified_at='2025-10-23 20:58:36', hash='f2d1ea8f7036ff47c406b6fa25096a5fbab088c6fa5c8cb27
44dc3f1eb4fd35a')
FileInfo(full_path='project_root/data/processed/example_UTF16_processed.txt', file_name='example_UTF16_processed.txt', size=1384,
last_modified_at='2025-10-23 20:58:36', hash='97ccab3c3edceb5f98ebb758907fb14d4af5cdf7eb7da7e9e9bc180ded
251bd9')
FileInfo(full_path='project_root/data/processed/example_UTF8_processed.txt', file_name='example_UTF8_processed.txt', size=1103,
last_modified_at='2025-10-23 20:58:36', hash='69fc65e03e6feacccb4d76b4afb650a0165aba84775f02cea2c1c15eb850
e875')
FileInfo(full_path='project_root/data/processed/example_Windows-1251_processed.txt', file_name='example_Windows-
1251_processed.txt', size=691, last_modified_at='2025-10-23 20:58:36', hash='a7043c61d84ab76119d566285190cb878d6a499bcf913
747e7644438757f4b38')

Convert a list to a JSON array:START
--> Got 1526 characters
Convert a list to a JSON array:END

Saving text to file:START
--> Saved 1526 bytes to "./project_root/output/processed_data_file_infos.json" file.
Saving text to file:END

Printing file contents:START
File: ./project_root/output/processed_data_file_infos.json
Contents of the file infos JSON output file:
[
    {
        "file_name": "example_ASCII_processed.txt",
        "full_path": "project_root/data/processed/example_ASCII_processed.txt",
        "size": 691,
        "last_modified_at": "2025-10-23 20:58:36",
```



```
        "hash": "9f6c333dbc4c3ebb437b136ccbc6e1b3630c14b5a2d567f0e0464e02b48e0a8b"
    },
    {
        "file_name": "example_ISO-8859-5_processed.txt",
        "full_path": "project_root/data/processed/example_ISO-8859-5_processed.txt",
        "size": 691,
        "last_modified_at": "2025-10-23 20:58:36",
        "hash": "f2d1ea8f7036ff47c406b6fa25096a5fbab088c6fa5c8cb2744dc3f1eb4fd35a"
    },
    {
        "file_name": "example_UTF16_processed.txt",
        "full_path": "project_root/data/processed/example_UTF16_processed.txt",
        "size": 1384,
        "last_modified_at": "2025-10-23 20:58:36",
        "hash": "97ccab3c3edceb5f98ebb758907fb14d4af5cdf7eb7da7e9e9bc180ded251bd9"
    },
    {
        "file_name": "example_UTF8_processed.txt",
        "full_path": "project_root/data/processed/example_UTF8_processed.txt",
        "size": 1103,
        "last_modified_at": "2025-10-23 20:58:36",
        "hash": "69fc65e03e6feacccb4d76b4afb650a0165aba84775f02cea2c1c15eb850e875"
    },
    {
        "file_name": "example_Windows-1251_processed.txt",
        "full_path": "project_root/data/processed/example_Windows-1251_processed.txt",
        "size": 691,
        "last_modified_at": "2025-10-23 20:58:36",
        "hash": "a7043c61d84ab76119d566285190cb878d6a499bcf913747e7644438757f4b38"
    }
]
Printing file contents:END

Convert a JSON array to a list:START
--> Got 5 FileInfo objects
Convert a JSON array to a list:END

Compare FileInfo lists:START
--> Both lists have 5 items
--> Both lists are identical
Compare FileInfo lists:END
Are the original and deserialized file info lists equal? - True

####################################################################################################

Loading file contents as string:START
--> File: ./project_root/output/processed_data_file_infos.json
```



```
--> Encoding: utf-8
--> Read 1526 characters from "./project_root/output/processed_data_file_infos.json" file.
Loading file contents as string:END

Load JSON schema from file:START
--> Loaded schema from "./schemas/json-schema-file_infos_list.json"
{
    "$schema": "http://json-schema.org/draft-07/schema#",
    "type": "array",
    "description": "",
    "minItems": 1,
    "uniqueItems": true,
    "items": {
        "type": "object",
        "required": [
            "file_name",
            "full_path",
            "size",
            "last_modified_at",
            "hash"
        ],
        "additionalProperties": false,
        "properties": {
            "file_name": {
                "type": "string",
                "minLength": 1
            },
            "full_path": {
                "type": "string",
                "minLength": 1
            },
            "size": {
                "type": "number"
            },
            "last_modified_at": {
                "type": "string",
                "minLength": 1
            },
            "hash": {
                "type": "string",
                "minLength": 1
            }
        }
    }
}
Load JSON schema from file:END
```



```
Validate JSON against schema:START
--> JSON is valid against the schema.
Validate JSON against schema:END
JSON Schema validation: SUCCESS

####################################################################################################
Finished at: 2025-10-23 20:58:36
==================================================

PS D:\Projects\github.com-YuriAbele\AIU\Python\L12\HW>
```