

```
""" utils.py
```

Utility functions for Cybersecurity Capstone Project.

Includes:

- File hashing
- Timestamp formatting
- Directory creation helpers
- Safe environment variable retrieval """

```
import os import hashlib from datetime import datetime from dotenv
import load_dotenv
```

```
load_dotenv()
```

```
def create_dir_if_not_exists(path: str) -> None: """ Create directory
if it does not exist. Args: path (str): Directory path """
os.makedirs(path, exist_ok=True)
```

```
def compute_sha256(file_path: str) -> str | None: """ Compute SHA-256
hash of a file.
```

Args:

```
    file_path (str): Path to file
```

Returns:

```
    str | None: SHA-256 hex digest or None if error
    """
```

```
try:
```

```
    with open(file_path, "rb") as f:
        return hashlib.sha256(f.read()).hexdigest()
```

```
except Exception as e:
```

```
    print(f"[ERROR] Failed to compute SHA-256 for {file_path}: {e}")
    return None
```

```
def get_iso_timestamp() -> str: """ Get current time as ISO 8601
formatted string.
```

Returns:

```
    str: ISO 8601 timestamp
"""
return datetime.now().isoformat()
```

```
def get_env_variable(key: str) -> str | None: """ Safely get
environment variable.
```

Args:

```
    key (str): Environment variable key
```

Returns:

```
    str | None: Value or None if not found
"""
value = os.getenv(key)
if value is None:
    print(f"[WARNING] Environment variable '{key}' not set.")
return value
```