

# Storage Manager Design Doc - version 0

## Page

```
pub struct Page {  
    pub data: Vec<u8> // Fixed-size buffer holds the raw bytes of a page (PAGE_SIZE = 8KB)  
}
```

---

### 0.create\_page API

**Description:**

Create a page in disk for a file.

**Function:**

```
pub fn create_page(file: &mut File)
```

---

**Input:**

file: file to create to a file

**Output:**

Create a page at the end of the file.

**Implementation:**

1. Initializes a new page in memory with all zeros (PAGE\_SIZE bytes).
  2. Moves the file cursor to the end of the file.
  3. Writes the entire zero-filled page to the file, effectively creating a new page on disk.
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### 1. read\_page API

**Description:**

Reads a page from a disk/file into memory.

**Function:**

```
pub fn read_page(file: &mut File, page: &mut Page, page_num: u32)
```

---

**Input:**

file: file to read from,  
page: memory page to fill,  
page\_num: page number to read

**Output:**

Populates the given memory page with data read from the file.

**Implementation:**

1. Calculates the **offset** as page\_num \* PAGE\_SIZE and moves the file cursor to the correct position.
2. Reads data from that offset position up to offset + PAGE\_SIZE and copies it into the page memory.

**Cases Handled:**

1. Checks the file size and returns an error if the requested page does not exist in the file.
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## 2.write\_page API

### Description:

Write a page from memory to disk/file.

### Function:

<b>pub fn write_page</b> (file: &mut File, page: &mut Page, page_num: u32)
--

### Input:

file: file to write,

page: memory page to copy from,

page\_num: page number to write

### Output:

Writes the contents of the given memory page to the file at the specified page offset.

### Implementation:

1. Calculates the **offset** as `page_num * PAGE_SIZE` and moves the file cursor to the correct position.
  2. copy the contents of the given memory page from offset to offset + `PAGE_SIZE` positions to the file.
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<!-- Few Design choices to consider:

1. In Read and Write page should we pass file name or File pointer.
2. Because in create page passing file name is better than passing file pointer. -->