LAB 08: MIPS Exceptions and I/O

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Agenda

1. Exceptions
2. Memory Mapped I/O
3. Live Examples
4. Tasks

Exceptions

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- In MIPS, all the instructions inside text segment are in the try block.

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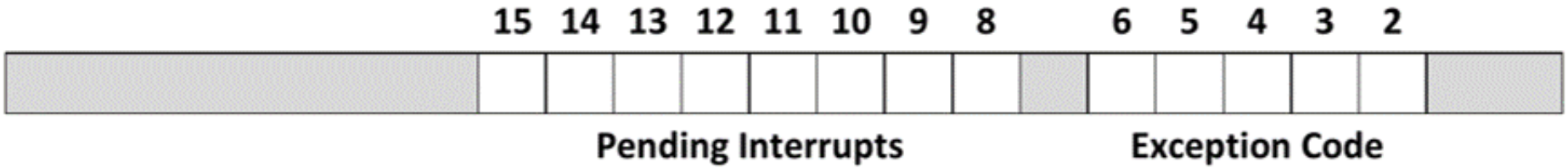

The **Cause** Register **$13**

Exception Codes

Common Exception Codes for MIPS

Code	Name	Description
0	INT	Hardware Interrupt
4	ADDRL	Address error exception caused by load or instruction fetch
5	ADDRS	Address error exception caused by store
6	IBUS	Bus error on instruction fetch
7	DBUS	Bus error on data load or store
8	SYSCALL	System call exception caused by the **syscall** instruction
9	BKPT	Breakpoint exception caused by the **break** instruction
10	RI	Reserved instruction exception
12	OVF	Arithmetic overflow exception
13	TRAP	Exception caused by a trap instruction
15	FPE	Floating-Point exception cause by a floating-point instruction

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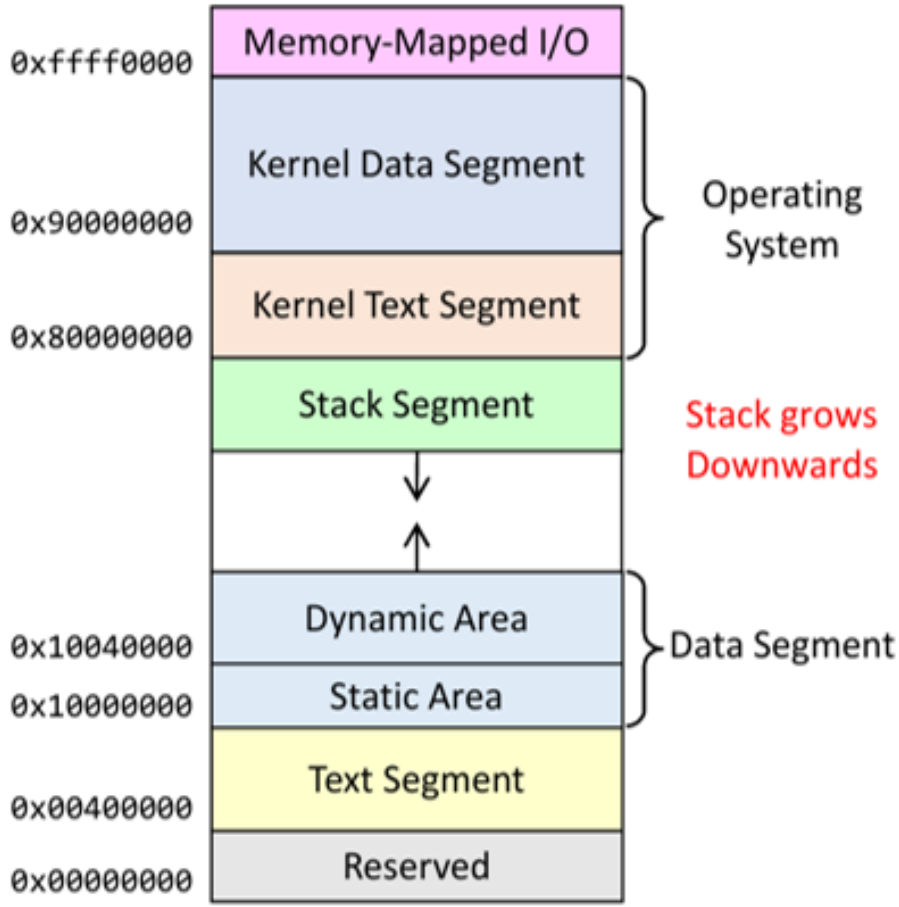

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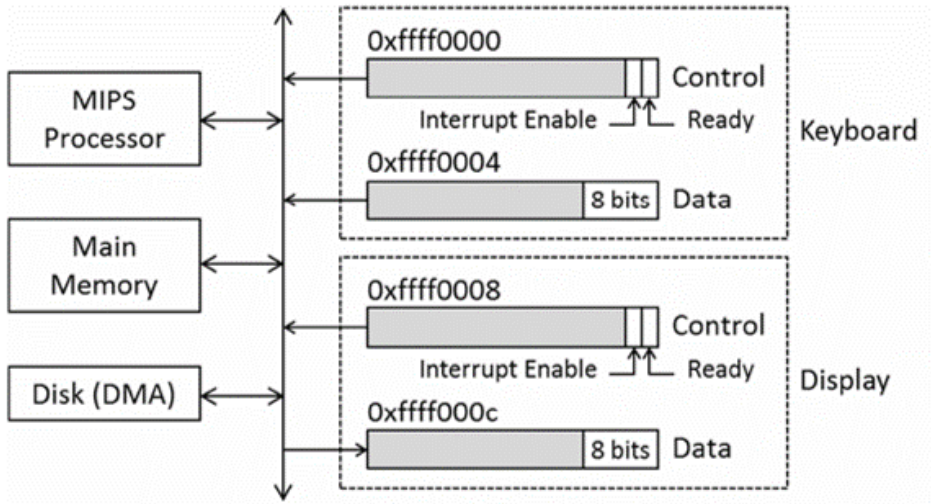

MIPS Memory Mapped I/O

Live Examples

Task #1

Write a MIPS assembly program that reads two integers from the user **x** and **y**. If y is zero, raise an exception and the user should be prompted to enter a different value of y. If y is not zero, perform the operation x/y.
(Hint: use trap instruction after reading y)

Sample Run

```
Enter Dividend (x): 10
Enter Divisor (y): 0
Divide By Zero Exception.
Please enter a different value for y.
Enter Divisor (y): 2
The result of x/y is 5
```

Task #2

Write a MIPS assembly program that reads a string str (one character at a time) from the user using Memory Mapped I/O (DO NOT USE syscall). Loop over each character and flip its case (i.e. the uppercase should be small case and vice versa). Finally, print the modified String (one character at a time) again using Memory Mapped I/O (DO NOT USE syscall).

Sample Run

```
Hello, World!
hELLO, wORLD!
```