# Class Description

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| Package the class belongs to | Class name | What it is | What it does |
| edu.gwu.common | Util | This is the class for utility. | It provides methods:   1. Get current time 2. Transformation between Bits and Int value 3. Transformation between Bits and Binary String 4. Transformation between Bits Instruction and Binary String 5. Merge list |
| edu.gwu.core | Cache | This is the class for cache and implements Memory Interface. | It provides methods:   1. For reading: 2. if cache-hit   Return the value stored in cache   1. if cache-miss   Load the value from memory   1. For writing: 2. if cache-hit   Modify the value in cache  Modify the value in memory via write-through   1. if cache-miss   Load the value from memory to cache  Modify the value in cache  Modify the value in memory via write-through |
| CPU | This is the class to simulate CPU. | It provides methods:  Simulate the CPU to execute a single circle, a single instruction and a series of instructions. |
| MainMemory | This is the class to simulate MainMemory. | It provides methods:  Simulate the MainMemory to store instructions and data. |
| Memory | This is an interface. | It provides a protocol for all different kinds of memories. |
| ProgramCompiler | This is the class to simulate program compiler. | It provides methods:  Simulate the program compiler to decode the instructions to the binary format. |
| Register | This is the class to simulate registers. | It provides methods:  Simulate the Register to store temporary values. |
| Setting | This is the class for our simulator’s setting. | It sets the size of main memory and cache. |
| IODevice | This is an interface for IO devices. | It provides a protocol for all different kinds of IO devices. |
| Log | This is the class for the log information. | It logs the information of our simulator. |
| edu.gwu.core.basic | InstructionCircle | This is the class for one circle in an instruction. | It defines all circles contained in the instruction set. |
| InstructionCircles | This is the class for a series of circles in an instruction. | It provides methods:  To generate instructions with circles. |
| InstructionInfo | This is the class for the information of an instruction. | It stores the information of an instruction. |
| InstructionSet | This is the class for the set of all instructions. | It defines all the instructions. |
| InstructionSetInfo | This is the class for the information of the instruction set | It stores the information of the instruction set. |
| CPUOutputSignalBuffer | This is the class for the output buffer of CPU. | It stores output signals for all different kinds of devices. One device can read outputs for it from this buffer. |
| Word | This is the class for a word in Mainmemory. | It defines the attributes of the word. |
| edu.gwu.exception | IllegalInstructionCodeException | This is the class for illegal instruction code exception. | It defines the action to handle the illegal instruction code exception. |
| IllegalMemoryAddressException | This is the class for illegal memory address exception. | It defines the action to handle the illegal memory address exception. |
| IllegalOperationCodeException | This is the class for illegal operation code exception. | It defines the action to handle the illegal operation code exception. |
| IllegalTrapCodeException | This is the class for illegal trap code exception. | It defines the action to handle the illegal trap code exception. |
| InstructionExecuteException | This is the class for instruction executing exception. | It defines the action to handle the instruction executing exception. |
| RegisterNotFoundException | This is the class for register not found exception. | It defines the action to handle the register not found exception. |
| edu.gwu.frame | CachePanel | This is the GUI class for cache module. | It displays the information of cache. |
| CodeLoader | This is the GUI class for code loader module. | It loads the instructions entered by users to the main memory. |
| ConsolePanel | This is the GUI class for console module. | It displays the executing information of the instructions. |
| KeyboardPanel | This is the GUI class for keyboard module. | It simulates the keyboard to let the users enter information. |
| MainFrame | This is the GUI class for the main frame of our simulator. | It integrates the different modules and show them. |
| MemoryPanel | This is the GUI class for the memory module. | It shows the information stored in memory. |
| RegisterPanel | This is the GUI class for the register module. | It shows the information of all registers. |
|  | PrinterPanel | This is the GUI class for the printer module. | It displays the results of users’ operation. |