CO-ASSIGNMENT

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COURSE=BTECH IT

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TOPIC: DATA HAZARDS

DATA HAZARDS

1. Data hazards occurs when an instruction depends on the result of the previous instruction and that result of the indtruction has not been computed yet by the system.
2. it is nothing but the dependency of data
3. there are four types of data dependencies:they are

* RAW(read after write)
* WAR(write after read)
* RAR(read after read)
* WAW(write after write)

These data hazards are explained in detail

***READ AFTER WRITE(RAW):*** It is also called as flow dependeny or true dependency.it occurs when the value produced by the instruction is needed by the subsequent instructions.

Eg:

MUL R1,R2,R3;

SUB R5,R1,R4;

* In the first instruction R1 is used as the destination register(output stored in R1),which is again used as a source register(value used to perform operation) in the second instruction.
* In such case the SUB instruction depends on the result of the first instruction so data dependency occurs

***WRITE AFTER READ(WAR):***

It is also called as anti dependency .these hazards occurs when the output of an instruction is used to write being read in the previous instruction

Eg:

ADD R1,R2,R3;

SUB R2,R4,R5;

* In the first instruction R2 is used as the source register,which is then used as the destination register in the second instruction.
* Data dependency occurs by this way too.

***WRITE ATFER WRITE(WAW):***

It is also called as output dependency.the hazard occur when the output register of an instruction is used for write after being written in the previous instruction

Eg:

DIV R1,R2,R3;

MUL R1,R4,R5;

* In this case the R1 register is used as the destination register in the instruction 1 and also as the destination register in second instruction.
* Now the register R1 will have the v

***aaREAD AFTER READ(RAR):***

It occurs when the both the instructions are used as the source register i.e,

Eg:  
MUL R1,R2,R3;

SUB R4,R2,R5;

* In the above case the register R2 is used as the source register.since reading the register doesn’t changes the register value,these Read after read (RAR) hazard doesn’t cause a problem for the processsor