Simulador Multithreading para Arquiteturas Escalar e Superescalar

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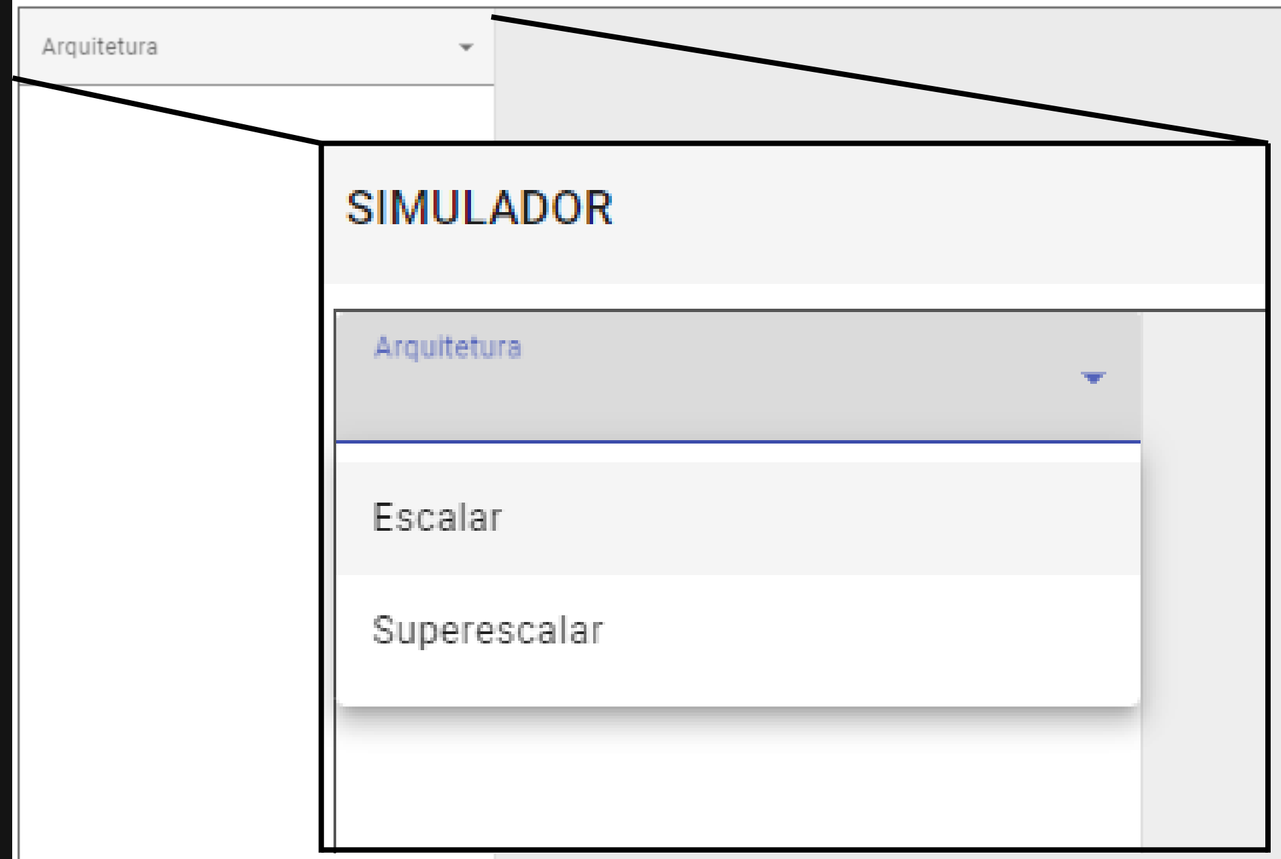
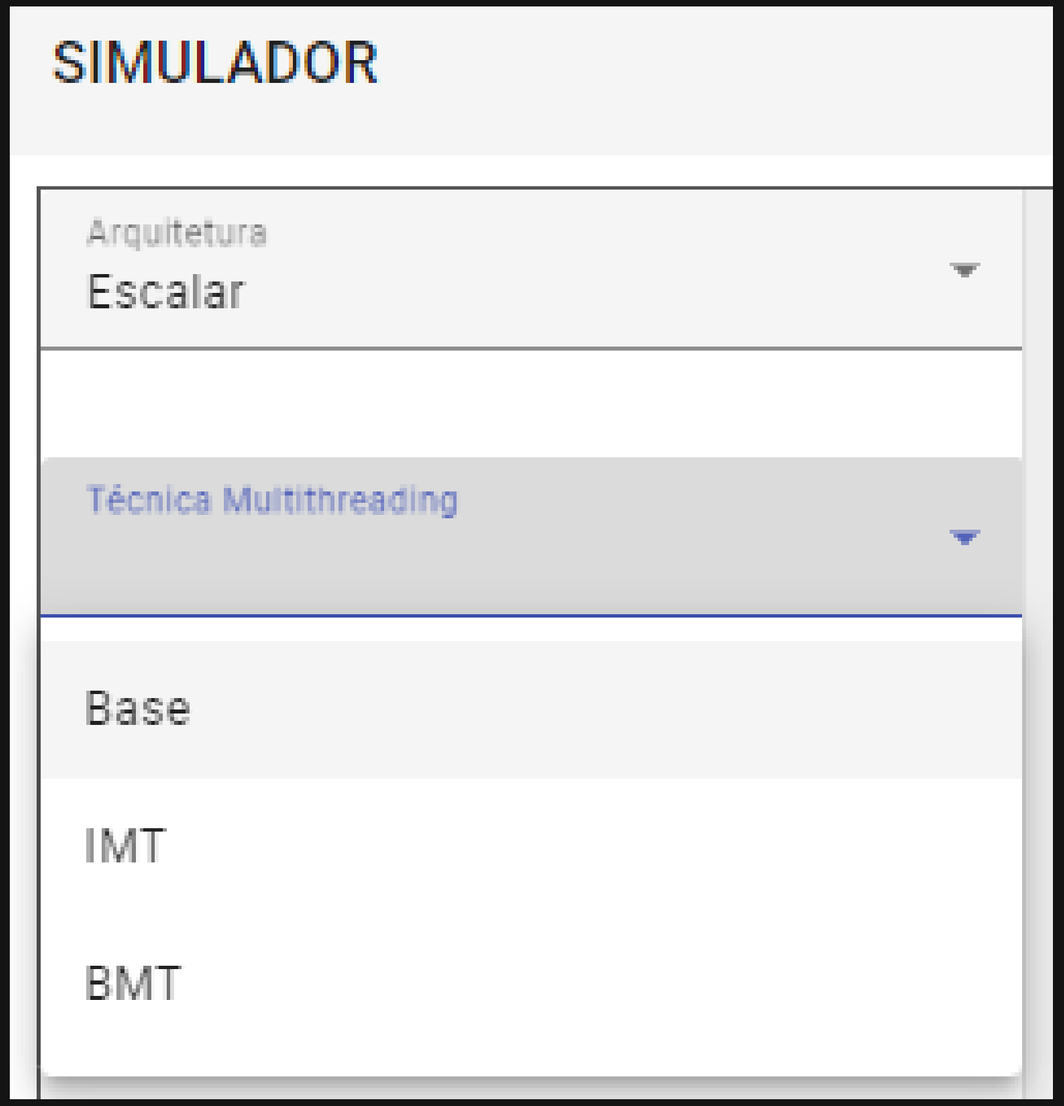
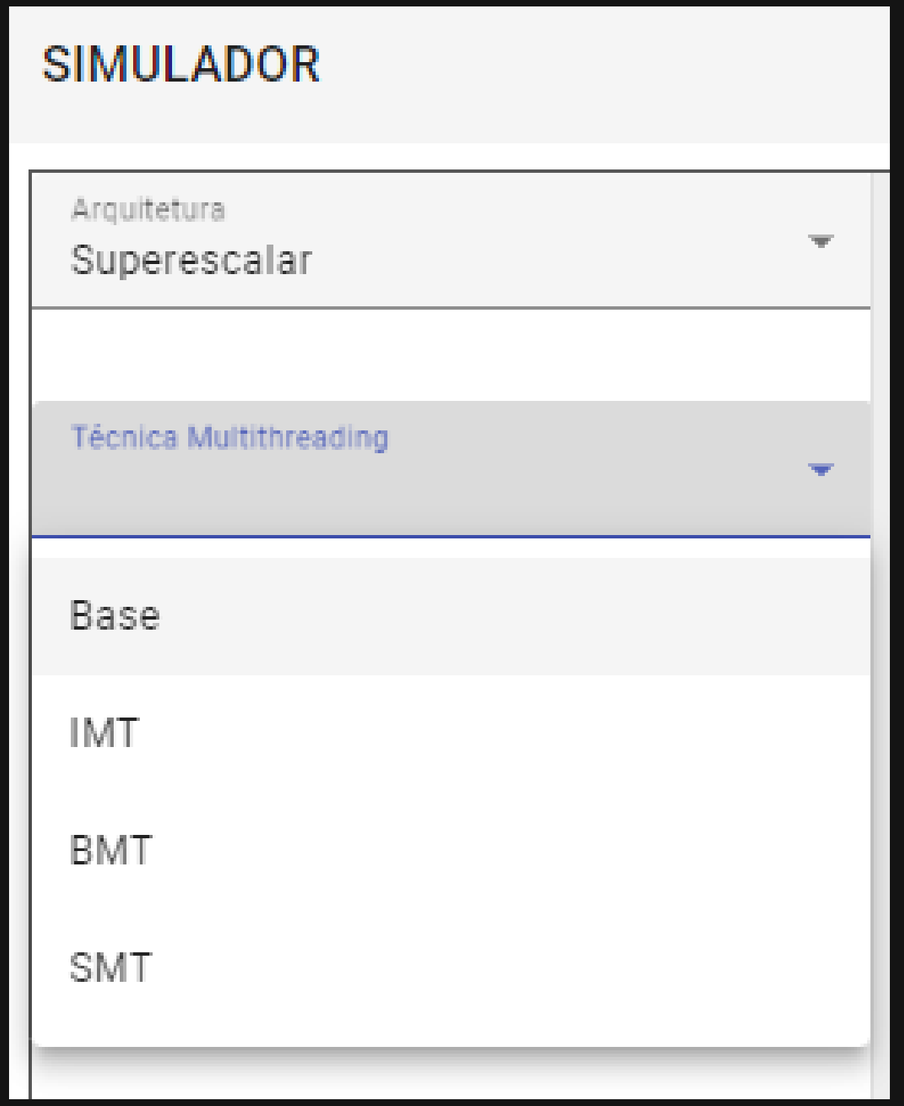
SIMULADOR

Arquitetura




SIMULADOR
Arquitetura
Escalar
Técnica Multithreading
Base
IMT
BMT


SIMULADOR
Arquitetura
Superescalar
Técnica Multithreading
Base
IMT
BMT
SMT

Teste Escalar Base

18	T1: LBU R17, 41(R3)	T1: MULHU R2, R16, R13	T1: MULHU R7, R29, R23	T1: REM R30, R29, R7	T1: AND R11, R0, R7
19	T1: DIV R20, R7, R12	T1: LBU R17, 41(R3)	T1: MULHU R2, R16, R13	T1: MULHU R7, R29, R23	T1: REM R30, R29, R7
20	T1: ADD R16, R22, R15	T1: DIV R20, R7, R12	T1: LBU R17, 41(R3)	T1: MULHU R2, R16, R13	T1: MULHU R7, R29, R23
21		T1: ADD R16, R22, R15	T1: DIV R20, R7, R12	T1: LBU R17, 41(R3)	T1: MULHU R2, R16, R13
22			T1: ADD R16, R22, R15	T1: DIV R20, R7, R12	T1: LBU R17, 41(R3)
23				T1: ADD R16, R22, R15	T1: DIV R20, R7, R12
24					

Métricas	Resultado
CPI	1.2
Bolhas	0
Ciclos	24
Instrucoes	20

Teste Escalar IMT

77	T1: MULHU R25, R0, R22	T4: SLTU R24, R23, R2	T3: SLL R5, R19, R31	T2: ADD R26, R13, R20	T1: LH R13, 629(R1)
78	T2: REMU R31, R31, R15	T1: MULHU R25, R0, R22	T4: SLTU R24, R23, R2	T3: SLL R5, R19, R31	T2: ADD R26, R13, R20
79	T3: LW R20, 823(R26)	T2: REMU R31, R31, R15	T1: MULHU R25, R0, R22	T4: SLTU R24, R23, R2	T3: SLL R5, R19, R31
80	T4: MUL R11, R31, R17	T3: LW R20, 823(R26)	T2: REMU R31, R31, R15	T1: MULHU R25, R0, R22	T4: SLTU R24, R23, R2
81		T4: MUL R11, R31, R17	T3: LW R20, 823(R26)	T2: REMU R31, R31, R15	T1: MULHU R25, R0, R22
82			T4: MUL R11, R31, R17	T3: LW R20, 823(R26)	T2: REMU R31, R31, R15
83				T4: MUL R11, R31, R17	T3: LW R20, 823(R26)
84					T4: MUL R11, R31, R17

Métricas	Resultado
CPI	1.05
Bolhas	0
Ciclos	84
Instrucoes	80

Teste Escalar BMT

80	T4: LW R6, 810(R13)	T4: MULHU R4, R24, R30	T3: BGE R11, R31, 651	T3: SRL R9, R23, R29	T3: BNE R4, R1, 888
81	T4: BNE R23, R26, 196	T4: LW R6, 810(R13)	T4: MULHU R4, R24, R30	T3: BGE R11, R31, 651	T3: SRL R9, R23, R29
82	T4: REMU R15, R10, R24	T4: BNE R23, R26, 196	T4: LW R6, 810(R13)	T4: MULHU R4, R24, R30	T3: BGE R11, R31, 651
83	T4: MULHSU R29, R2, R10	T4: REMU R15, R10, R24	T4: BNE R23, R26, 196	T4: LW R6, 810(R13)	T4: MULHU R4, R24, R30
84		T4: MULHSU R29, R2, R10	T4: REMU R15, R10, R24	T4: BNE R23, R26, 196	T4: LW R6, 810(R13)
85			T4: MULHSU R29, R2, R10	T4: REMU R15, R10, R24	T4: BNE R23, R26, 196
86				T4: MULHSU R29, R2, R10	T4: REMU R15, R10, R24
87					T4: MULHSU R29, R2, R10

Métricas	Resultado
CPI	1.09
Bolhas	3
Ciclos	87
Instrucoes	80

Teste Superscalar Base

		T0: JAL R5, 296 Memória T0: LH R21, 207(R14)	T0: SH R19, R15(492)
8		ULA T0: SRL R21, R14, R20 T0: AND R8, R21, R4 Desvio T0: BLTU R11, R23, 972 Memória	T0: SLT R26, R14, R30 T0: SLT R22, R6, R18 T0: JAL R5, 296 T0: LH R21, 207(R14)
9		ULA Desvio Memória	T0: SRL R21, R14, R20 T0: AND R8, R21, R4 T0: BLTU R11, R23, 972

Métricas	Resultado
IPC	3.33
CiclosExecucao	6
Instrucoes	20

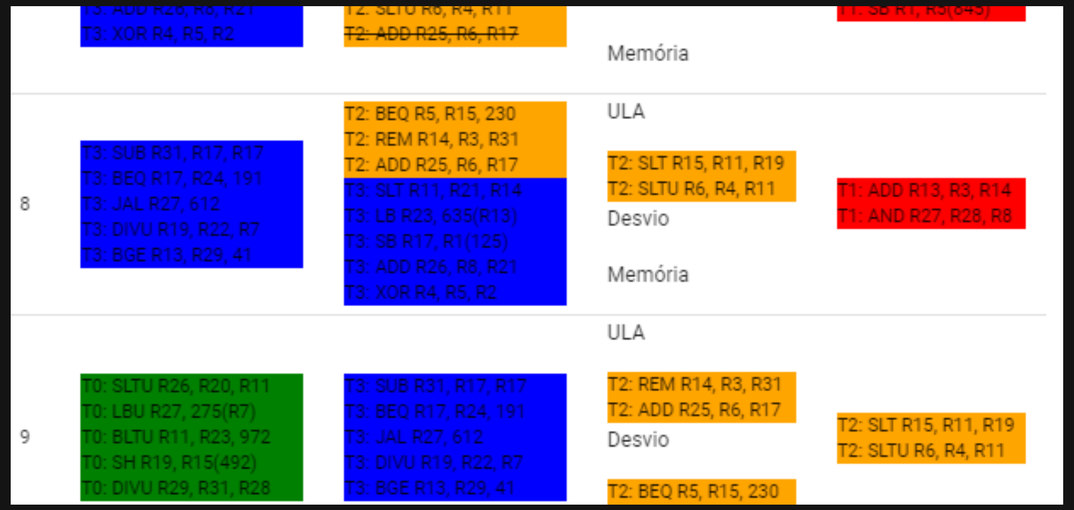
Teste Superescalar IMT

1	T0: SLT R5, R17, R0 T0: ADD R4, R5, R15 T0: SRA R24, R27, R7 T0: SLL R14, R8, R19		Desvio Memória
2	T1: ADD R13, R3, R14 T1: XOR R30, R30, R18 T1: OR R4, R10, R10 T1: SB R1, R5(845) T1: AND R27, R28, R8	T0: MULH R9, R30, R22 T0: SLT R5, R17, R0 T0: ADD R4, R5, R15 T0: SRA R24, R27, R7 T0: SLL R14, R8, R19	ULA Desvio Memória
3	T2: SRL R23, R16, R1 T2: BLT R8, R9, 303 T2: BGEU R12, R27, 790 T2: BLTU R15, R1, 878 T2: BLTU R3, R8, 804	T0: ADD R4, R5, R15 T0: SRA R24, R27, R7 T0: SLL R14, R8, R19 T1: ADD R13, R3, R14 T1: XOR R30, R30, R18 T1: OR R4, R10, R10 T1: SB R1, R5(845) T1: AND R27, R28, R8	ULA T0: MULH R9, R30, R22 T0: SLT R5, R17, R0 Desvio Memória

16	T2: BLTU R3, R8, 804		Desvio Memória
17			ULA Desvio T2: BLTU R3, R8, 804 Memória
18			ULA Desvio T2: BLTU R3, R8, 804

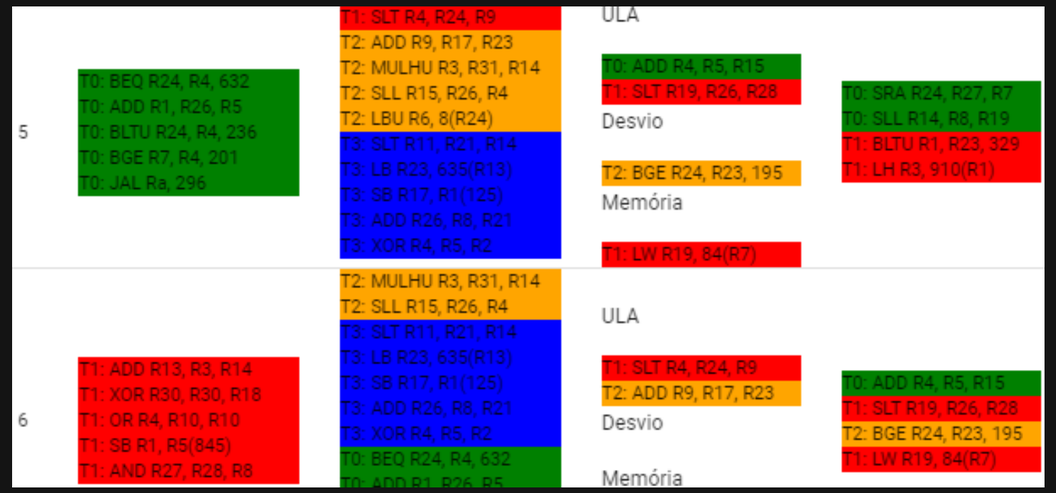
Métricas	Resultado
IPC	1.82
CiclosExecucao	11
Instrucoes	20

Teste Superescalar BMT



Métricas	Resultado
IPC	2.47
CiclosExecucao	17
Instrucoes	42

Teste Superescalar SMT



Métricas	Resultado
IPC	3.33
CiclosExecucao	6
Instrucoes	20

OBRIGADO!!

LINK PARA O PROJETO:

https://github.com/pdMiranda/AC_III/tree/main/Trabalho_02/Arq3