Exercício Prático 5

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EXPERIENCIA 1:

```
long c;
byte i,j;
long inicio, fim, tempo;

void setup() {
  Serial.begin(9600);
}

void loop() {
  i = 1;
  j = 3;
  inicio = micros();
  for(c = 0; c < 1000000; c = c + 1) i = i ;
  fim = micros();
  tempo = fim - inicio;
  Serial.print("tempo = ");
  Serial.println(tempo);
}
```

Monitor serial

```
empo = 2462716
empo = 2462960
empo = 2462960
empo = 2462956
empo = 2462968
empo = 2462960
```

		USE PARA O TESTE i = i op 3			USE PARA O TESTE i = i op j		
TIPO	TEMPO BASE	SOMA	OR	MULT	SOMA	OR	MULT
byte	2462960	2526108	2526108	2652396	2652156	2652396	2841832
int	2715544	2841592	2778688	3031276	3094428	3094428	3599592
float	3220712	12437600	XXXXXX	10356415	12690432	XXXXXX	10609000

MIPS (ATM328P)						
	CONSTANTE				VARIÁVEL	
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	15,8358143	15,83581	5,27883	5,285524	5,27883	2,639414
int	7,93348566	15,83682	3,16724	2,63933	2,63933	1,13116

MFLOPS (ATM328P)						
	CONSTANTE				VARIÁVEL	
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
float	0,10849649	XXXXXX	0,14014	0,1056	XXXXXX	0,135349

CPI						
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	1,010368	1,010368	3,03098	3,027136	3,03098	6,061952
int	2,016768	1,010304	5,05171	6,062144	6,06214	14,14477
float	147,470208	XXXXXX	114,171	151,5155	XXXXXX	118,2126

EXPERIENCIA 2:

TESTE EM C:

MAQUINA 1

		USE PARA O TESTE i = i op 3			USE PARA O TESTE i = i c		
TIPO	TEMPO BASE	SOMA	OR	MULT	SOMA	OR	MULT
byte	23,8	26,7	26,3	29,8	27,8	27,3	26,6
int	24,2	31,4	29,7	30,7	27,6	25,4	39,4
float	27,1	38,9	XXXXXX	38,1	30,6	XXXXXX	32,3

MIPS (ATM328P)						
	CONSTANTE				VARIÁVEL	
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	3448,275862	4000	1666,6667	2500	2857,14	3571,4286
int	1388,888889	1818,182	1538,4615	2941,176	8333,33	657,89474

MFLOPS (ATM328P)						
	CONSTANTE				VARIÁVEL	
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
float	847,4576271	XXXXXX	909,09091	2857,143	XXXXXX	1923,0769

CPI						
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	8,7E+13	7,5E+13	1,8E+14	1,2E+14	1,1E+14	8,4E+13
int	2,16E+14	1,65E+14	1,95E+14	1,02E+14	3,6E+13	4,56E+14
float	3,54E+14	XXXXXX	3,3E+14	1,05E+14	XXXXXX	1,56E+14

MAQUINA 2

		USE PARA O TESTE i = i c			USE PARA O TESTE i = i op		
TIPO	TEMPO BASE	SOMA	OR	MULT	SOMA	OR	MULT
byte	21,5	22,5	22,5	23,1	24	23	23,2
int	20,9	22,4	22,9	30,7	22,2	21,6	20,9
float	20,5	26	XXXXXX	1039	26,5	XXXXXX	28,1

MIPS (ATM328P)						
	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	10000	10000	6250	4000	6666,7	5882
int	6666,666667	5000	1020	7692	14286	0

MFLOPS (ATM328P)						
	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
float	1818,181818	XXXXXX	9,818	1667	XXXXXX	9,452

CPI						
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	1,8E+13	2E+13	3E+13	5E+13	3E+13	3E+13
int	2,7E+13	4E+13	2E+14	2E+13	1E+13	0
float	9,9E+13	XXXXXX	2E+16	1E+14	XXXXXX	1E+14

MAQUINA 3

		USE PARA O TESTE i = i op 3			USE PARA O TESTE i = i op j		
TIPO	TEMPO BASE	SOMA	OR	MULT	SOMA	OR	MULT
byte	14	19	18,8	18	18,3	18,2	18,5
int	13,8	18,8	18,8	17,7	18,2	18,4	18,2
float	13,8	23	XXXX	23,2	22,8	XXXXXX	22,7

MIPS (ATM328P)

	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	2000	2083,333333	2500	2325,581395	2380,95238	2222,222222
int	2000	2000	2564,102564	2272,727273	2173,91304	2272,727273

MFLOPS (ATM328P)

	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
float	1086,956522	XXXXXX	1063,829787	1111,111111	XXXXXX	1123,595506

CPI

TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	1,45E+14	1,392E+14	1,16E+14	1,247E+14	1,218E+14	1,305E+14
int	1,45E+14	1,45E+14	1,131E+14	1,276E+14	1,334E+14	1,276E+14
float	2,668E+14	XXXXXX	2,726E+14	2,61E+14	XXXXXX	2,581E+14

MAQUINA 4

		USE PARA O TESTE i = i op 3			USE PARA O TESTE i = i op j		
TIPO	TEMPO BASE	SOMA	OR	MULT	SOMA	OR	MULT
byte	12,4	23,9	23,8	29,8	24	23,9	29,8
int	12,9	24	23,8	30	23,9	24,1	30
float	13,1	56,9	XXXX	59,9	37,9	XXXXXX	37,9

MIPS (ATM328P)

	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	869,5652	877,192982	574,71264	862,068966	869,56522	574,7126437
int	900,9009	917,431193	584,79532	909,090909	892,85714	584,7953216

MFLOPS (ATM328I

	CONSTANTE			VARIÁVEL		
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
float	228,3105	XXXXXX	213,67521	403,225806	XXXXXX	403,2258065

CPI

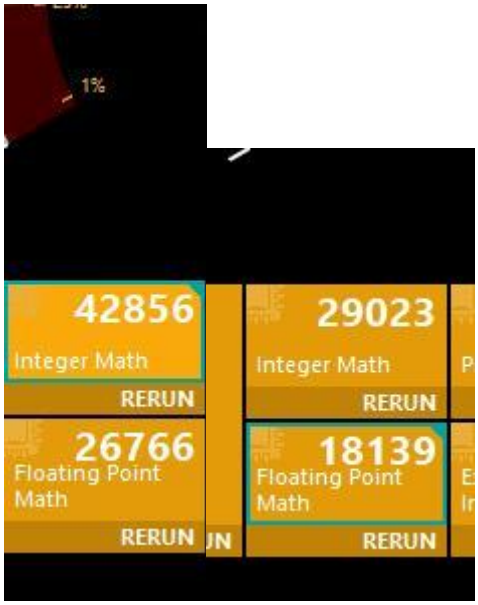
TIPO	SOMA	OR	MULT	SOMA	OR	MULT
byte	3,68E+14	3,648E+14	5,568E+14	3,712E+14	3,68E+14	5,568E+14
int	3,55E+14	3,488E+14	5,472E+14	3,52E+14	3,584E+14	5,472E+14
float	1,4E+15	XXXXXX	1,498E+15	7,936E+14	XXXXXX	7,936E+14

TESTE BENCHMARK

ID	PROG EM C	PROG EM C	TESTE PERFORMANCE	TESTE PERFORMANCE
	SPEEDUP (int)	SPEEDUP(float)	SPEEDUP (int)	SPEEDUP(float)
Intel i5 5th	1	1	1	1
Intel i5 7th	Nao teve	Nao teve	1,016	1,28
Apple M1 SIlicon	1,62	1,56	2,22	3,54
Intel i5 10400	1,51	1,48	3,017	2,69


PerformanceTest 11.1
File Edit View Tests Advanced Baseline Help
CPU MARK
Your CPU vs the world
PASSMARK
1162
Partial result
RERUN
CPU MARK
4695
13th Percentile
RERUN
2D MARK
RUN
3D MARK
RUN
MEMORY MARK
RUN
DISK MARK
RUN
0
6600
13200
19800
26400
33000
39600
46200
52800
59400
66000
75%
25%
1%
99%
CPU Mark
Percentile
Your CPU Mark score
4695
Percentile
13%
World Average
19756
World Minimum
0
World Maximum
203815
4695
CPU Mark
RERUN
14205
Integer Math
RERUN
20
Prime Numbers
RERUN
58097
Compression
RERUN
437
Physics
RERUN
1583
CPU Single Threaded
RERUN
9943
Floating Point Math
3893
Extended Instructions (SSE)
1520
Encryption
RERUN
8102
Sorting
RERUN
Run all the tests from the CPU test suite


PerformanceTest 11.1
File Edit View Tests Advanced Baseline Help
CPU MARK
Your CPU vs the world
PASSMARK
1408
Partial result
RERUN
CPU MARK
5692
16th Percentile
RERUN
2D MARK
RUN
3D MARK
RUN
MEMORY MARK
RUN
DISK MARK
RUN
0
6600
13200
19800
26400
33000
39600
46200
52800
59400
66000
75%
25%
1%
99%
CPU Mark
Percentile
Your CPU Mark score
5692
Percentile
16%
World Average
19751
World Minimum
0
World Maximum
203815
5692
CPU Mark
RERUN
14438
Integer Math
RERUN
27
Prime Numbers
RERUN
76979
Compression
RERUN
472
Physics
RERUN
2063
CPU Single Threaded
RERUN
12769
Floating Point Math
6770
Extended Instructions (SSE)
1707
Encryption
9031
Sorting


1%
42856
Integer Math
RERUN
29023
Integer Math
RERUN
26766
Floating Point
Math
RERUN
18139
Floating Point
Math
RERUN