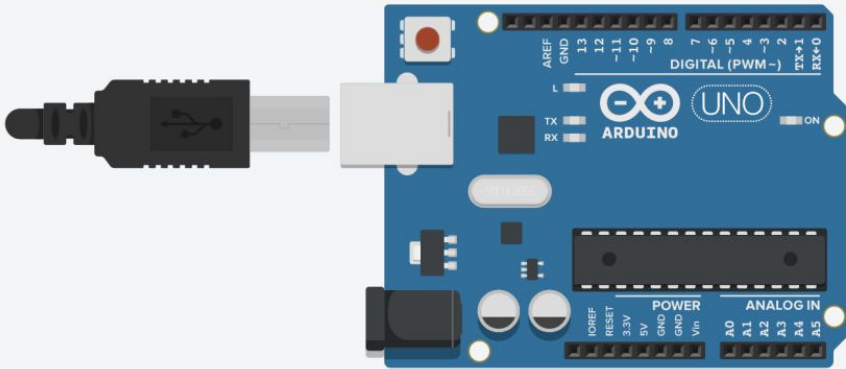


Atividade Prática 5

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Parte 1 – Print Arduino

Swanky Sango



Code

```
1 // C++ code
2 //
3
4 long c;
5 int i, j;
6 long inicio, fim, tempo;
7
8 void setup()
9 {
10   Serial.begin(9600);
11 }
12
13 void loop()
14 {
15   i = 1;
16   j = 3;
17
18   inicio = micros();
19   for(c = 0; c < 1000000; c = c+1)
20   {
21     i = i + 3;
22   }
23
24   fim = micros();
25   tempo = (fim - inicio);
26   Serial.print("tempo = ");
27   Serial.println(tempo);
28
29 }
```

Serial Monitor

```
tempo = 2715296
tempo = 2715548
tempo = 2715548
tempo = 2525856
tempo = 2526108
tempo = 2526108
tempo = 2841872
```

Parte 1 – Tabela Arduino

		i = i op 3			i = i op j		
Tipo	Tempo Base	Soma	Or	Mult	Soma	Or	Mult
Byte	tempo = 2462956	tempo = 2525856	tempo = 2399808	tempo = 2652400	tempo = 2652396	tempo = 2841836	tempo = 2841836
Int	tempo = 2715292	tempo= 3473284	tempo = 2589004	tempo = 3031276	tempo = 3094424	tempo = 3220468	tempo = 3599592
Float	tempo = 3220712	tempo = 12437600	N/A	tempo = 10356164	tempo = 12690432	N/A	tempo = 10609000
* Int	tempo = 2715296	tempo= 4231044	tempo= 3473284	tempo= 4357336	tempo= 4862512	tempo = 3788788	tempo= 5367676

Parte 1 – Tabela Arduino

MIPS (ATM328P)

	Constante			Variável		
Tipo	Soma	Or	Mult	Soma	Or	Mult
Byte	~15.898251 MIPS	~15.835814 MIPS	~5.278605 MIPS	~5.278716 MIPS	~2.639358 MIPS	~2.639358 MIPS
Int	~7.917656 MIPS	~7.918409 MIPS	~3.164717 MIPS	~2.637604 MIPS	~1.979508 MIPS	~1.130838 MIPS
* Int	~7.902390 MIPS	~7.917907 MIPS	~3.164677 MIPS	~0.465714 MIPS	~0.931539 MIPS	~0.377019 MIPS

Parte 1 – Tabela Arduino

MFLOPS (ATM328P)

Constante

Variável

Tipo	Soma	Or	Mult	Soma	Or	Mult
Float	~0.108496 MFLOPS	N/A	~0.140145 MFLOPS	~0.105600 MFLOPS	N/A	~0.135349 MFLOPS

Parte 1 – Tabela Arduino

CPI						
	Constante			Variável		
Tipo	Soma	Or	Mult	Soma	Or	Mult
Byte	39.407296	40.413696	42.4384	42.438336	45.469376	45.469376
Int	45.465472	41.424064	48.500416	49.510784	51.527488	57.593472
Float	199.0016	N/A	165.698624	203.046912	N/A	169.744
* Int	45.46944	45.465472	48.500544	69.717376	60.620608	85.882816

Parte 2 – PassMark Benchmark

```
File Edit View Terminal Tabs Help
PassMark PerformanceTest Linux

AMD Ryzen 5 5600X 6-Core Processor (x86_64)
6 cores @ 4932 MHz | 31.3 GiB RAM
Number of Processes: 12 | Test Iterations: 1 | Test Duration: Medium
-----
CPU Mark:                22942
Integer Math              69505 Million Operations/s
Floating Point Math       39196 Million Operations/s
Prime Numbers             123 Million Primes/s
Sorting                   32771 Thousand Strings/s
Encryption                17812 MB/s
Compression               261 MB/s
CPU Single Threaded       3400 Million Operations/s
Physics                   1734 Frames/s
Extended Instructions (SSE) 15003 Million Matrices/s

Memory Mark:              3025
Database Operations       6073 Thousand Operations/s
Memory Read Cached        34662 MB/s
Memory Read Uncached      22217 MB/s
Memory Write              14624 MB/s
Available RAM             24948 Megabytes
Memory Latency            51 Nanoseconds
Memory Threaded           35628 MB/s
-----

Results submitted: https://www.passmark.com/baselines/V10/display.php?id=500694756009

Use ESC or CTRL-C to exit
A: Run All Tests   C: Run CPU Tests   M: Run Memory Tests   U: Upload Test Results
```

Parte 3 – Print Código em C

File Edit Selection View Go Run Terminal Help

EXPLORER

TESTE_C

- > bin
- > obj
- ≡ a.out
- ≡ main
- C main.c
- ≡ main.exe
- ≡ main.o
- \$ rodar.sh
- ≡ teste_c.cbp
- ≡ teste_c.depend
- ≡ teste_c.layout

C main.c > main()

```
4
5 int main()
6 {
7     clock_t inicio, fim, T;
8     float Tempo, media = 0;
9     register int c;
10
11     int a, b;
12     int *i = &a;
13     int *j = &b;
14
15     *i=3;
16     *j=1;
17
18     int k, num1 = 1, num2 = 3;
19
20     T = CLOCKS_PER_SEC;
21     for (k = 1; k <= 10; k = k + 1)
22     {
23         inicio = clock();
24         for (c = 1; c <= 10000000; c = c + 1)
25         {
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Code

Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
Tempo : 5 ms
5 ms
[Done] exited with code=0 in 0.084 seconds

OUTLINE
TIMELINE

periodo5*

Ln 26, Col 32 Spaces: 4 UTF-8 CRLF C Linux

Parte 3 – Print Código em C - máquina 2

The screenshot displays a Windows 8.1 desktop environment. In the foreground, a LibreOffice Draw window titled 'Envio_Gabriel_2.odg' is open, showing a drawing area with a sidebar on the left containing various drawing tools. A command prompt window is overlaid on the drawing, showing the execution of a C program. The command prompt displays the following output:

```
G:\EP05_2024_2\Projetos_AC_II\C++\ep_05_ac2_c>gcc main_2.c -o main_2.exe
G:\EP05_2024_2\Projetos_AC_II\C++\ep_05_ac2_c>.\main_2.exe
Tempo Base
CHAR
Tempo gasto media: 51.5 ms.
Int
Tempo gasto media: 65.6 ms.
Float
Tempo gasto media: 64.1 ms.
Tempo Soma
CHAR
Tempo gasto media: 57.8 ms.
Int
Tempo gasto media: 48.5 ms.
Float
```

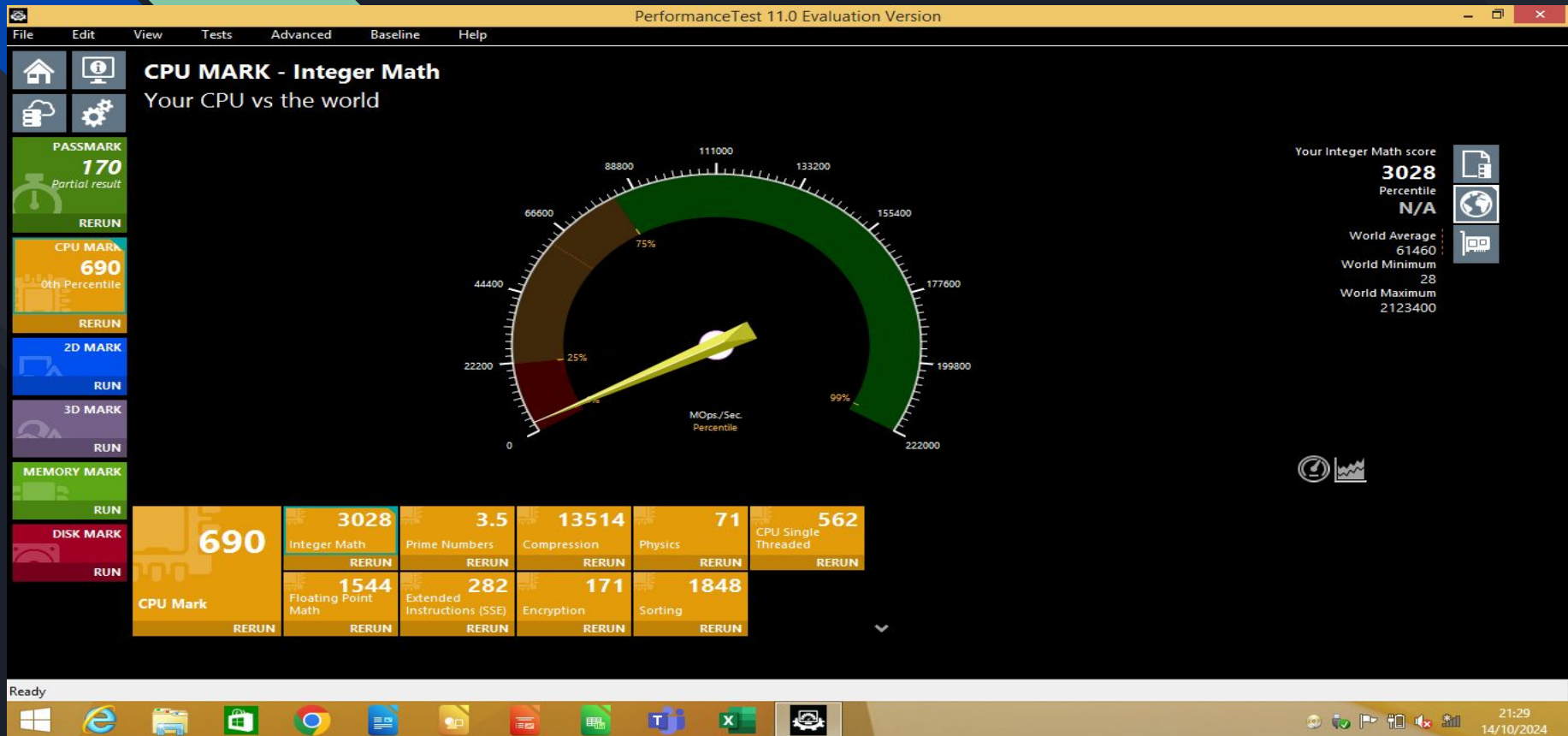
In the background, a Windows 'Sistema' (System) window is open, displaying system information. The window shows the following details:

- Windows 8.1 Pro
- © 2013 Microsoft Corporation. Todos os direitos reservados.
- Obtenha mais recursos com a nova edição do Windows
- Processador: Pentium(R) Dual-Core CPU T4500 @ 2.30GHz 2.30 GHz
- Memória instalada (RAM): 2,00 GB
- Tipo de sistema: Sistema Operacional de 64 bits, processador com base em x64
- Caneta e Toque: Nenhuma Entrada à Caneta ou por Toque está disponível para este vídeo
- Nome do computador, domínio e configurações de grupo de trabalho:
 - Nome do computador: tael
 - Nome completo do computador: tael
 - Descrição do computador:
 - Grupo de trabalho: WORKGROUP
- Ativação do Windows:
 - Windows ativado
 - Ler os Termos de Licença para Software Microsoft
 - ID do Produto (Product ID): 00261-50000-00000-AA229
 - Alterar chave do produto (Product Key)

The taskbar at the bottom shows the Start button and several application icons, including Internet Explorer, File Explorer, and various office applications. The system tray on the right indicates the date and time as 22:04 on 14/10/2024.

The screenshot shows a Linux desktop environment. In the foreground, there is a terminal window titled "Terminal - mae@mae-pc:/run/media/mae/Ventoy/EP05_2024_2/Projetos_A". The terminal displays a series of timing measurements, each taking 35 ms, followed by a summary "Tempo gasto media: 35 ms." and the word "Int". To the right of the terminal is a file manager window showing the contents of the directory "/run/media/mae/Ventoy/EP05_2024_2/Projetos_A". The files listed are "bin", "obj", "ep_05_ac2_c.cbp", "ep_05_a", "results.txt", "teste_c.bat", and "teste_c.windows.bat". In the background, there is a window titled "Sobre o Ambiente de área de trabalho Xfce" which displays system information: Dispositivo: mae-pc; Nome do Sistema Operacional: Manjaro Linux; Build ID: rolling; Tipo do Sistema Operacional: 64 bits; Distribuidor: Arch Linux; Versão do Xfce: 4.18; Versão do GTK: 3.24.43; Versão do Kernel: 6.10.13-3-MANJARO; CPU: Pentium(R) Dual-Core CPU T4500 @ 2.30GHz x 2; Memória: 1,9 GiB; GPU: Mesa Mobile Intel® GM45 Express Chipset (1,5 GiB). At the bottom of the screen, a status bar indicates "2 pastas | 10 arquivos: 73,8 KiB (75.609 bytes) | Espaço livre: 348,0 GiB".

Parte 3 – Print Passmark - máquina 2



Parte 3 – Print Passmark - máquina 2

PerformanceTest 11.0 Evaluation Version

File Edit View Tests Advanced Baseline Help

SYSTEM INFORMATION

	This Computer	Baseline #1	Baseline #2	Baseline #3	Baseline #4
PerformanceTest Information					
PerformanceTest Version	11.0 (Build 1020) WIN64	11.0 (Build 1000) WIN64	11.0 (Build 1000) WIN64	11.0 (Build 1000) WIN64	11.0 (Build 1000) WIN64
PassMark Rating	(N/A)	7377	8444	6989	3984
System Information					
System Name	TAEI				
Model					
Operating System	Windows 8.1 Professional Edition build...	Windows 10 Professional Edition build...	Windows 11 Professional Edition build...	Windows 10 Professional Edition build...	Windows 10 Home build 19045 (64-bit)
Motherboard Manufacturer	POSITIVO	Gigabyte Technology Co., Ltd.	ASUSTeK COMPUTER INC.	Gigabyte Technology Co., Ltd.	LENOVO
Motherboard Model	H242B	Z370 HD3-CF	PRIME Z690-P	X570 AORUS MASTER	20MF000BUS
Motherboard Version	2.0	x.x	Rev 1.x	Default string	SDK0R32862 WIN
BIOS Manufacturer	American Megatrends Inc.	American Megatrends Inc.	American Megatrends Inc.	American Megatrends International, L...	LENOVO
BIOS Version	201.T03	F3	1620	F36b	LENOVO - 1250
BIOS Release Date	2010/10/26	2017/09/06	2022/08/12	2022/02/16	2019/10/28
Power Source	AC	AC	AC	AC	AC
Power Mode	N/A	N/A	N/A	N/A	Maximum performance
CPU Information					
Manufacturer	GenuineIntel	GenuineIntel	GenuineIntel	AuthenticAMD	GenuineIntel
Type	Pentium Dual-Core T4500 @ 2.30GHz	Intel Core i7-8700K @ 3.70GHz	12th Gen Intel Core i5-12600K	AMD Ryzen 9 3900 12-Core	Intel Core i7-8750H @ 2.20GHz
Codename	Penryn	Coffee Lake	Alder Lake		Coffee Lake
CPUID	Family 6, Model 17, Stepping A, Revis...	Family 6, Model 9E, Stepping A	Family 6, Model 97, Stepping 2	Family 17, Model 71, Stepping 0	Family 6, Model 9E, Stepping A
Socket	Socket P (478)	LGA 1151	LGA 1700		LGA 1151
Lithography	45nm	14nm	10nm		14nm
Number of CPU's	1	1	1	1	1
Total Cores per CPU	2	6	10	12	6
Total Threads per CPU	2	12	16	24	12
P-Cores per CPU	2	6	6	12	6
E-Cores per CPU	N/A	N/A	4	N/A	N/A
Clock Frequencies	1600.0 MHz	3600.0 MHz (E5 - 1200.0 MHz)	3600.0 MHz (E5 - 1200.0 MHz)	3400.0 MHz	3300.0 MHz (E5 - 1200.0 MHz)

21:30
14/10/2024

Parte 3 – Configuração do PC

Ryzen 5 5600X - 6 cores / 12 threads @4.6 Ghz

32 GB RAM @ 3200 Mhz

Arch Linux - kernel versão 5.14.14

GCC E GCC-libs versão 11.1.0

Parte 3 – Configuração do PC 2

Intel® Pentium® T4500 - 2 cores / 2 threads @2.3 Ghz

2 GB RAM @ 800 Mhz

Manjaro XFCE 64 - kernel versão 6.10.13-3
Windows 8.1 Pro x64

GCC E GCC-libs versão 14.2.1

Parte 3 – Tabela Programa C - Máquina 1

		i = i op 3			i = i op j		
Tipo	Tempo Base	Soma	Or	Mult	Soma	Or	Mult
Byte	2.2 ms	16 ms	2.7 ms	18 ms	17 ms	6.4 ms	19 ms
Int	2.6 ms	3 ms	6.2 ms	4 ms	3.1 ms	8.1 ms	6.4 ms
Float	3.2 ms	27.8 ms	N/A	26 ms	44.6 ms	N/A	43 ms
* Int	2.2 ms	3.5 ms	2.3 ms	5.6 ms	5 ms	10.6 ms	8.2 ms

Parte 3 – Tabela Programa C - Máquina 1

MIPS (Meu PC)						
	Constante			Variável		
Tipo	Soma	Or	Mult	Soma	Or	Mult
Byte	~72463.768116 MIPS	2000000 MIPS	~63291.139241 MIPS	~67567.567568 MIPS	~238095.238095 MIPS	~59523.809524 MIPS
Int	2500000 MIPS	~277777.777778 MIPS	~714285.714286 MIPS	2000000 MIPS	~181818.181818 MIPS	~263157.894737 MIPS
* Int	~769230.769231 MIPS	10000000 MIPS	~294117.647059 MIPS	~357142.857143 MIPS	~119047.619048 MIPS	~166666.666667

Parte 3 – Tabela Programa C - Máquina 1

MFLOPS (Meu PC)						
	Constante			Variável		
Tipo	Soma	Or	Mult	Soma	Or	Mult
Float	~40650.406504 MIPS	N/A	~43859.649123 MIPS	~24154.589372 MIPS	N/A	~25125.628141 MIPS

Parte 3 – Tabela Programa C - Máquina 1

CPI						
	Constante			Variável		
Tipo	Soma	Or	Mult	Soma	Or	Mult
Byte	7.68	1.296	8.64	8.16	3.072	9.12
Int	1.44	2.976	1.92	1.488	3.888	3.072
Float	13.344	N/A	12.4	21.408	N/A	20.64
* Int	1.68	1.104	2.688	2.4	5.088	3.936

Dados Programa C Máquina 2

Notebook Positivo Sim+4025 Manjaro XFCE

		Use para o teste (i = i op j)			Use para o teste (i = i op 3)		
Tipo	Tempo base	Soma	Or	Mult.	Soma	Or	Mult.
Char	25,1	29	29	34	29	29	34,2
Int	23,8	29,5	26,5	34,2	25	26,3	34,1
Float	28,7	39	N/A	43	39	N/A	43
*int	29	28	28	35,2	26	27	37

Notebook Positivo Sim+4025 Windows 8.1

		Use para o teste (i = i op j)			Use para o teste (i = i op 3)		
Tipo	Tempo base	Soma	Or	Mult.	Soma	Or	Mult.
Char	25,1	56,5	57,2	67,3	57,1	62,9	82,6
Int	29,5	45,9	64,9	67,2	48,1	48,3	70,2
Float	28,7	75,6	N/A	2369,9	78,9	N/A	2342,1
*int	29	61,2	61,5	74,9	59	57,1	71,3

Dados Programa C Máquina 2

Notebook Positivo Sim+4025					
MIPS					MFLOPS
		char	int	*int	float
Constante	Soma	318,4713376	609,756098	310,559006	213,219616
	Mult.	236,9668246	265,251989	217,864924	4,27131386
	Or	311,5264798	282,485876	307,692308	N/A
Variável	Soma	312,5	537,634409	333,333333	199,203187
	Mult.	173,9130435	245,700246	236,406619	4,322642
	Or	264,5502646	531,914894	355,871886	N/A
CPI					
Constante	Soma	7,222	3,772	7,406	10,787
	Mult.	9,706	8,671	10,557	538,476
	Or	7,383	8,142	7,475	N/A
Variável	Soma	7,36	4,278	6,9	11,546
	Mult.	13,225	9,361	9,729	532,082
	Or	8,694	4,324	6,463	N/A

Parte 4 – Tabela Speedups

Maquina forte	ICS		CPIs						CPI-medio	
	Int	6E+07	Int	1.44	2.976	1.92	1.488	3.888	3.072	2.464
	Float	4E+07	Float	13.344	XXXX	12.4	21.408	XXXX	20.64	16,948
	ICS		CPIs						CPI-medio	
	Int	6E+07	Int	3,584	3,948	4,144	3,416	3,472	5,18	3,957333
	Float	4E+07	Float	6,664	XXXX	28,5712	6,552	XXXX	6,636	14,946
Maquina Fraca	ICS		CPIs						CPI-medio	
	Int	6E+07	Int	3,772	8,142	8,671	4,278	4,324	9,361	6,424667
	Float	4E+07	Float	10,787	N/A	538,476	11,546	N/A	532,082	273,22275

Parte 4 – Tabela Speedups

Maquina forte	Frequencia(Hz)	CPU-time		Speed-UP		Ryzen 5 5600x GCC e GCC-libs versão 11.1.0 Arch Linux - Kernel versão 5.14.14
	4.6Ghz	Int	0,032139	Int	4,568920	
		Float	0,22087	Float	4,933375	
	Frequencia(Hz)	CPU-time		Speed-UP		i7 7700HQ Windows 10 GCC-6.3.0-1
	2,8Ghz	Int	0,0848	Int	4,428703	
		Float	2,1351	Float	1,426091	
Maquina Fraca	Frequencia(Hz)	CPU-time		Speed-UP		Pentium dual cor T4500 GCC e GCC-libs versão 14.2.1 Linux Manjaro - Kernel versão 6.10.14
	2,3Ghz	Int	0,057433	Int	1	
		Float	0,81108	Float	1	