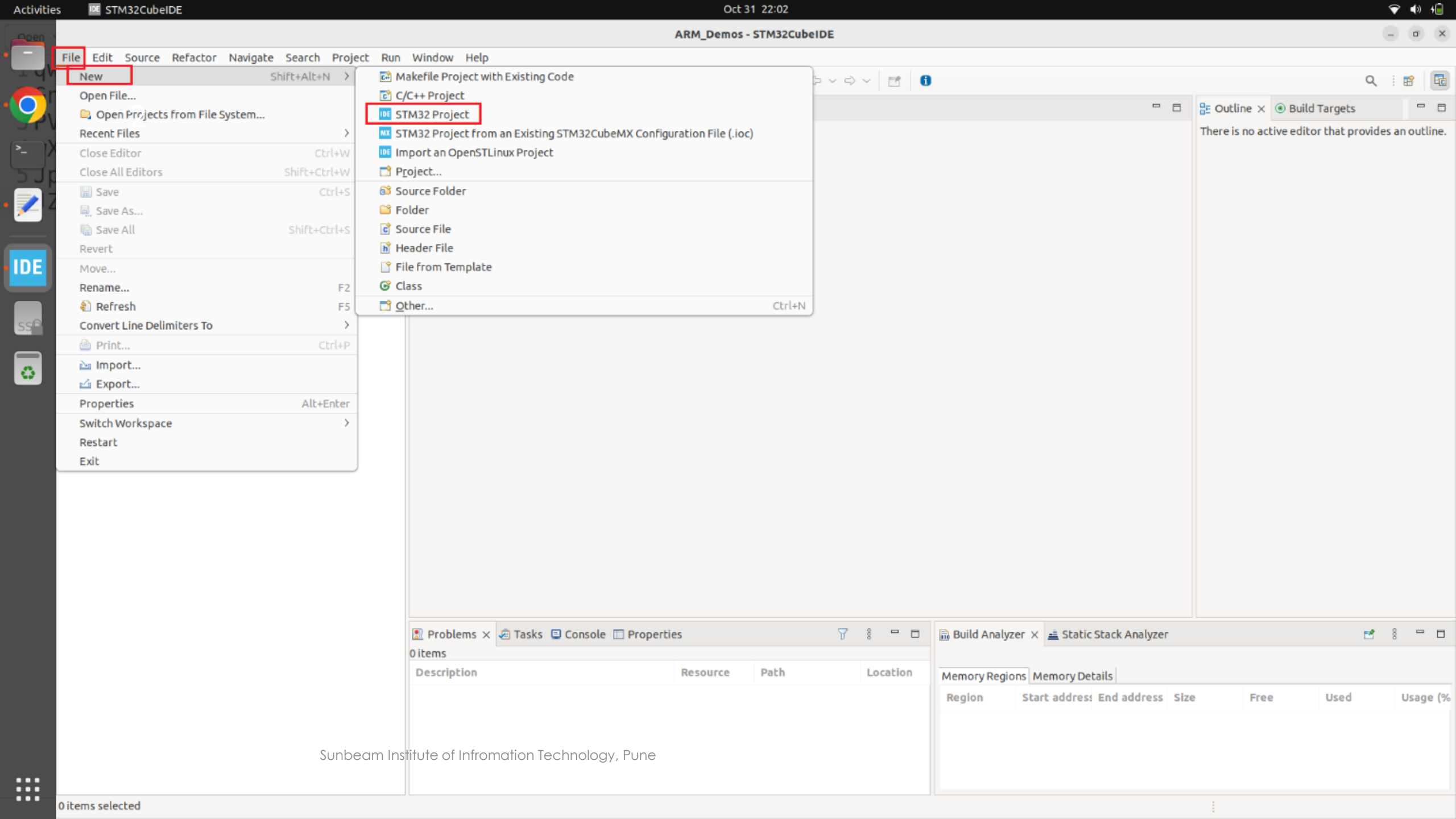
# STM32 Cube IDE  Debug Demo



**PG-DESD @ Sunbeam Pune**


Activities
STM32CubeIDE
Oct 31 22:02
ARM_Demos - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
New Shift+Alt+N
Open File...
Open Projects from File System...
Recent Files
Close Editor Ctrl+W
Close All Editors Shift+Ctrl+W
Save Ctrl+S
Save As...
Save All Shift+Ctrl+S
Revert
Move...
Rename... F2
Refresh F5
Convert Line Delimiters To
Print... Ctrl+P
Import...
Export...
Properties Alt+Enter
Switch Workspace
Restart
Exit
Makefile Project with Existing Code
C/C++ Project
STM32 Project
STM32 Project from an Existing STM32CubeMX Configuration File (.ioc)
Import an OpenSTLinux Project
Project...
Source Folder
Folder
Source File
Header File
File from Template
Class
Other... Ctrl+N
Outline
Build Targets
There is no active editor that provides an outline.
Problems
Tasks
Console
Properties
0 items
Description
Resource
Path
Location
Build Analyzer
Static Stack Analyzer
Memory Regions
Memory Details
Region
Start address
End address
Size
Free
Used
Usage (%
Sunbeam Institute of Infromation Technology, Pune
0 items selected

Activities STM32CubeIDE Oct 31 22:02

STM32 Project

File Edit Source Refactor

Project Explorer

basic

**Target Selection**

Select STM32 target or STM32Cube example

IDE

MCU/MPU Selector | Board Selector | Example Selector | Cross Selector

Board Filters

Commercial Part Number: STM32F407G-DISC1

PRODUCT INFO

- Type
- Supplier
- MCU / MPU Series
- Marketing Status
- Price

MEMORY

Ext. Flash = 0 (MBit)
0
Ext. EEPROM = 0 (kBytes)
0
Ext. RAM = 0 (MBit)
0

FEATURES

- Embedded Sensor
- User Button
- Camera
- CAN
- Connector

Features | Large Picture | Docs & Resources | Datasheet | Buy

STM32F4 Series

**STM32F407G-DISC1**

**Discovery kit with STM32F407VG MCU * New order code STM32F407G-DISC1 (replaces STM32F4DISCOVERY)**

ACTIVE
Product is in mass production

Part Number : STM32F4DISCOVERY
Commercial Part Number : STM32F407G-DISC1

Unit Price (US$) : 19.9

Mounted Device : STM32F407VGT6

The STM32F4DISCOVERY Discovery kit leverages the capabilities of the STM32F407 high-performance microcontrollers, to allow users to develop audio applications easily. It includes an ST-LINK/V2-A embedded debug tool, one ST-MEMS digital accelerometer, one digital microphone, one audio DAC with integrated class D speaker driver, LEDs, push-buttons, and a USB OTG Micro-AB connector.
Specialized add-on boards can be connected by means of the extension header connectors.

Boards List: 1 item

Export

| Overview | Commercial Part No | Type | Marketing Status | Unit Price (US$) | Mounted Device |
|---|---|---|---|---|---|
|  | STM32F407G-DISC1 | Discovery Kit | Active | 19.9 | STM32F407VGT6 |

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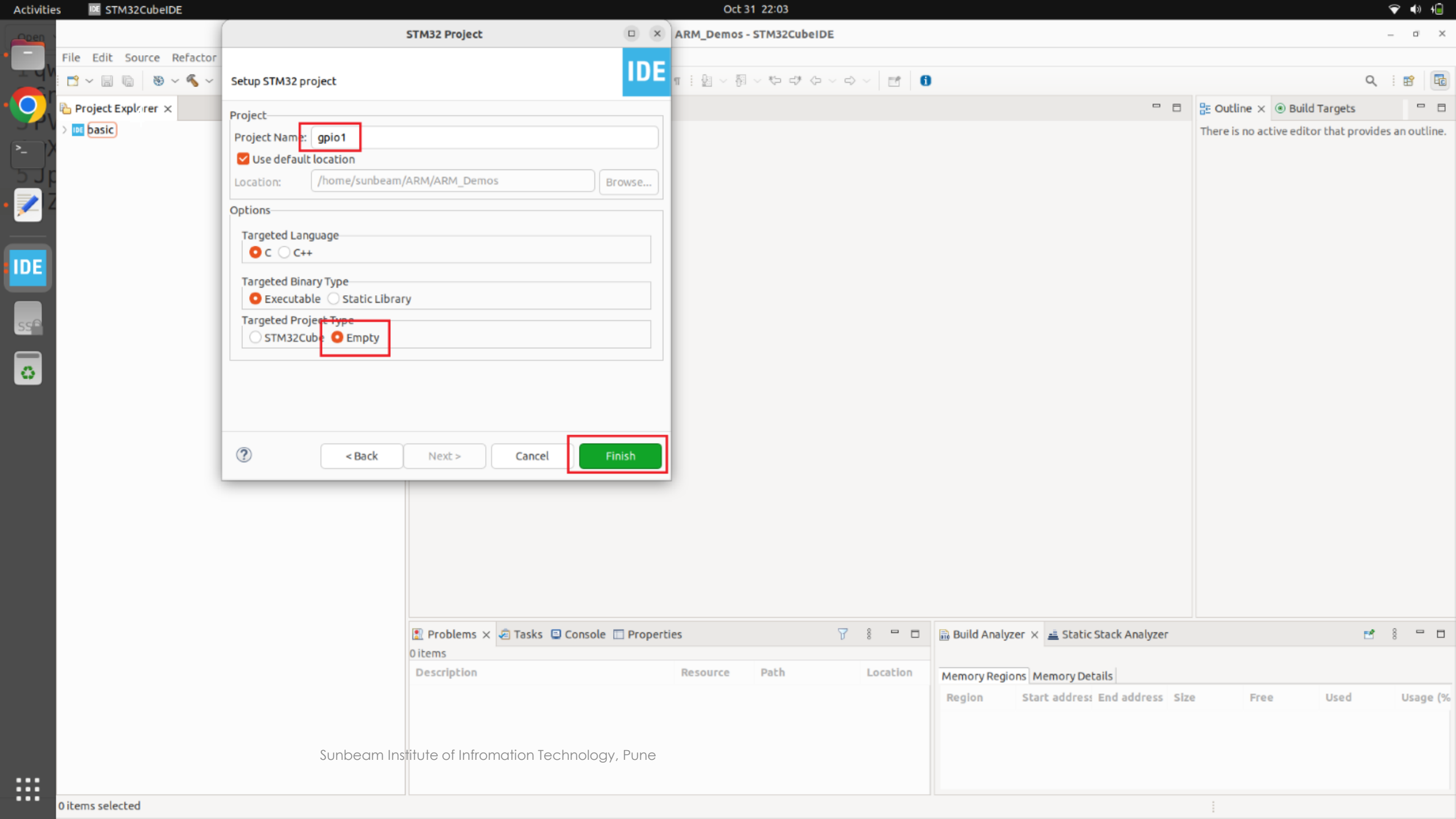
< Back | Next > | Cancel | Finish

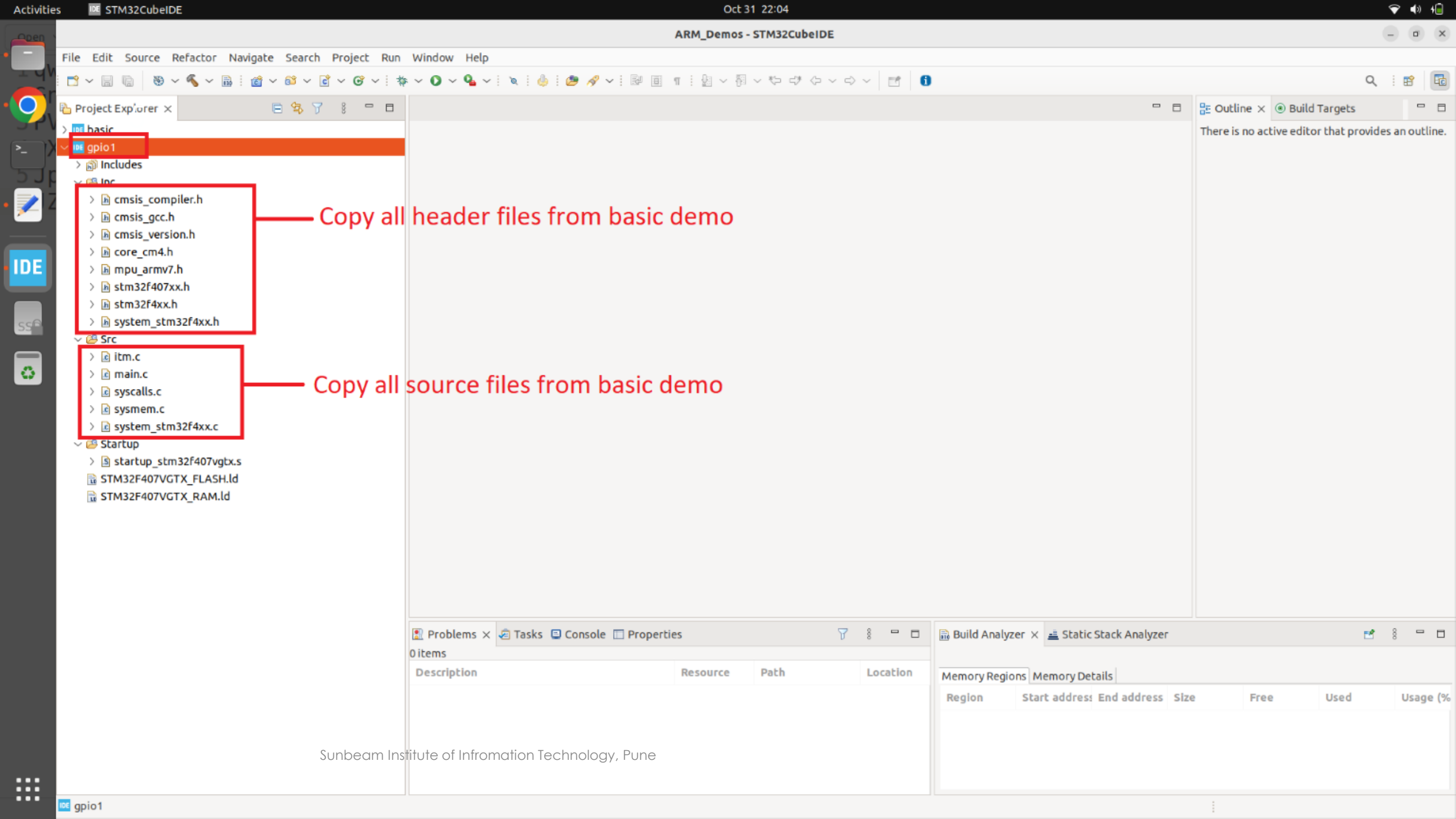
Build Targets

editor that provides an outline.

Used Usage (%

0 items selected


Activities
STM32CubeIDE
Oct 31 22:03
STM32 Project
Setup STM32 project
IDE
Project
Project Name: gpio1
Use default location
Location: /home/sunbeam/ARM/ARM_Demos
Browse...
Options
Targeted Language
C C++
Targeted Binary Type
Executable Static Library
Targeted Project Type
STM32Cube Empty
< Back
Next >
Cancel
Finish
ARM_Demos - STM32CubeIDE
File Edit Source Refactor
Project Explorer
basic
Outline
Build Targets
There is no active editor that provides an outline.
Problems
Tasks
Console
Properties
0 items
Description
Resource
Path
Location
Build Analyzer
Static Stack Analyzer
Memory Regions
Memory Details
Region
Start address
End address
Size
Free
Used
Usage (%
0 items selected


Activities
STM32CubeIDE
Oct 31 22:04
ARM_Demos - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
basic
gpio1
Includes
Inc
cmsis_compiler.h
cmsis_gcc.h
cmsis_version.h
core_cm4.h
mpu_armv7.h
stm32f407xx.h
stm32f4xx.h
system_stm32f4xx.h
Src
itm.c
main.c
syscalls.c
sysmem.c
system_stm32f4xx.c
Startup
startup_stm32f407vgtx.s
STM32F407VGTX_FLASH.ld
STM32F407VGTX_RAM.ld
Copy all header files from basic demo
Copy all source files from basic demo
Outline
Build Targets
There is no active editor that provides an outline.
Problems
Tasks
Console
Properties
0 items
Description
Resource
Path
Location
Build Analyzer
Static Stack Analyzer
Memory Regions
Memory Details
Region
Start address
End address
Size
Free
Used
Usage (%
gpio1

ARM_Demos - gpio1/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- basic
- gpio1
  - Includes
  - Inc
    - cmsis_compiler.h
    - cmsis_gcc.h
    - cmsis_version.h
    - core_cm4.h
    - mpu_armv7.h
    - stm32f407xx.h
    - stm32f4xx.h
    - system_stm32f4xx.h
  - Src
    - itm.c
    - main.c
    - syscalls.c
    - sysmem.c
    - system_stm32f4xx.c
  - Startup
    - startup_stm32f407vgtx.s
  - STM32F407VGTX_FLASH.ld
  - STM32F407VGTX_RAM.ld

Project menu:
- Open Project
- Close Project
- Build All Ctrl+B
- Build Configurations
- Build Project
- Build Working Set
- Clean...
- Build Automatically
- Build Targets
- C/C++ Index
- Generate Report
- Generate Code
- Properties

Properties

```
/* USER CODE BEGIN Header */
/**
  ******************************************************************************
  * File Name          : main.c
  * Description        : Main program body
  ******************************************************************************
  * (c) 2022 STMicroelectronics.
  * All rights reserved.
  *
  * This software is licensed under terms that can be found in the LICENSE file
  * in the root directory of this software component.
  * If no LICENSE file comes with this software, it is provided AS-IS.
  ******************************************************************************
  */
/* USER CODE END Header */

#include <stdint.h>
#include <stdio.h>

#if !defined(__SOFT_FP__) && defined(__ARM_FP)
  #warning "FPU is not initialized, but the project is compiling for an FPU. Please initialize the FPU before use."
#endif

int main(void)
{
    printf("Hello STM32!\n");
    printf("Hello DESD!\n");
    printf("God Bless You!\n");
}
```

Outline
- stdint.h
- stdio.h
- main(void) : int

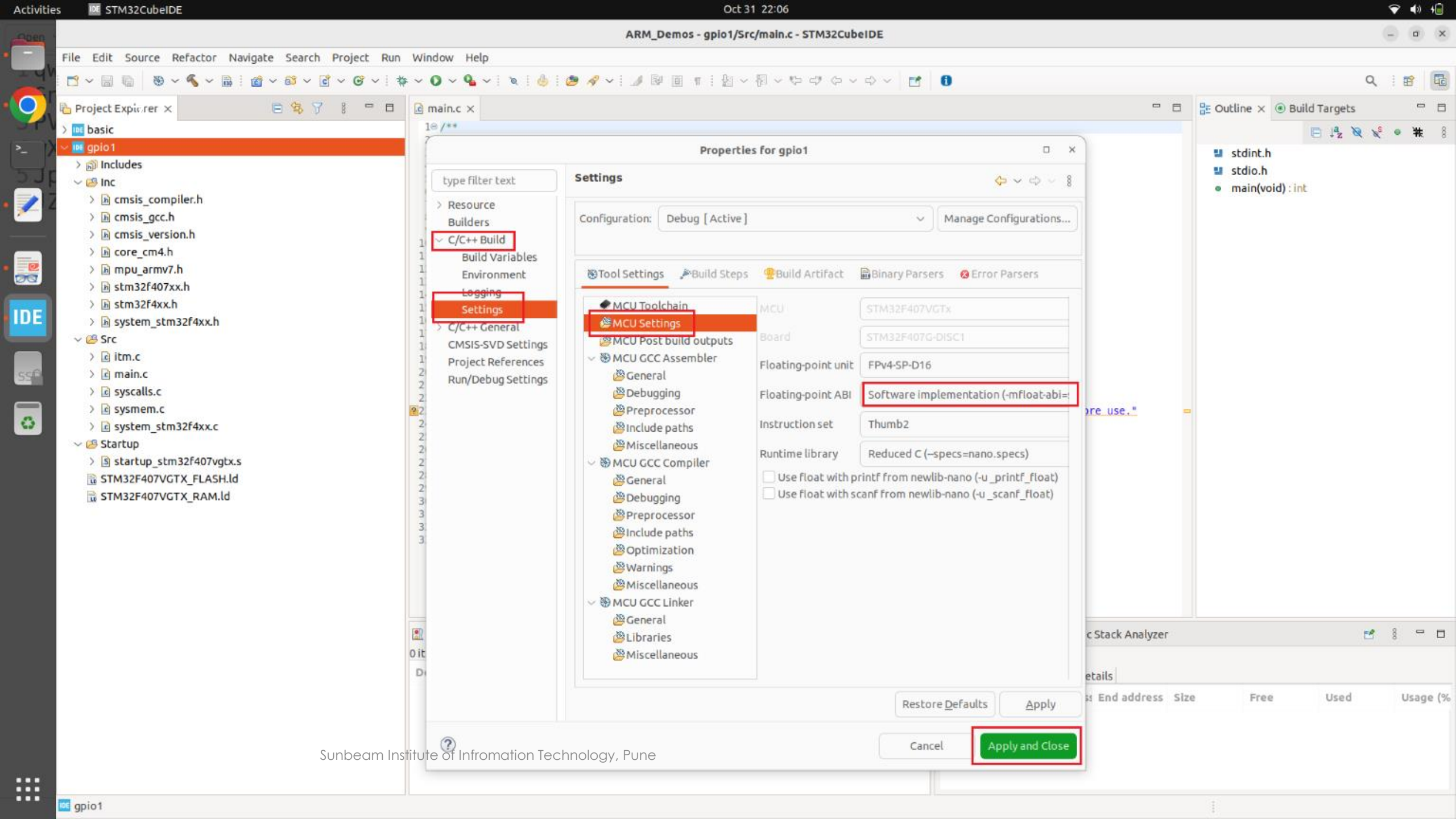
Build Targets

Problems Tasks Console Properties
0 items
Description Resource Path Location

Build Analyzer Static Stack Analyzer
Memory Regions Memory Details
Region Start address End address Size Free Used Usage (%



gpio1


Activities
STM32CubeIDE
Oct 31 22:06
ARM_Demos - gpio1/Src/main.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
basic
gpio1
Includes
Inc
cmsis_compiler.h
cmsis_gcc.h
cmsis_version.h
core_cm4.h
mpu_armv7.h
stm32f407xx.h
stm32f4xx.h
system_stm32f4xx.h
Src
itm.c
main.c
syscalls.c
sysmem.c
system_stm32f4xx.c
Startup
startup_stm32f407vgtx.s
STM32F407VGTX_FLASH.ld
STM32F407VGTX_RAM.ld
main.c
Properties for gpio1
type filter text
Resource
Builders
C/C++ Build
Build Variables
Environment
Logging
Settings
C/C++ General
CMSIS-SVD Settings
Project References
Run/Debug Settings
Settings
Configuration: Debug [ Active ]
Manage Configurations...
Tool Settings
Build Steps
Build Artifact
Binary Parsers
Error Parsers
MCU Toolchain
MCU Settings
MCU Post build outputs
MCU GCC Assembler
General
Debugging
Preprocessor
Include paths
Miscellaneous
MCU GCC Compiler
General
Debugging
Preprocessor
Include paths
Optimization
Warnings
Miscellaneous
MCU GCC Linker
General
Libraries
Miscellaneous
MCU
STM32F407VGTx
Board
STM32F407G-DISC1
Floating-point unit
FPv4-SP-D16
Floating-point ABI
Software implementation (-mfloat-abi=
Instruction set
Thumb2
Runtime library
Reduced C (--specs=nano.specs)
Use float with printf from newlib-nano (-u _printf_float)
Use float with scanf from newlib-nano (-u _scanf_float)
Restore Defaults
Apply
Cancel
Apply and Close
Outline
Build Targets
stdint.h
stdio.h
main(void) : int
Stack Analyzer
End address
Size
Free
Used
Usage (%
gpio1

ARM_Demos - gpio1/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- basic
- gpio1
  - Includes
  - Inc
    - cmsis_compiler.h
    - cmsis_gcc.h
    - cmsis_version.h
    - core_cm4.h
    - mpu_armv7.h
    - stm32f407xx.h
    - stm32f4xx.h
    - system_stm32f4xx.h
  - Src
    - itm.c
    - main.c
    - syscalls.c
    - sysmem.c
    - system_stm32f4xx.c
  - Startup
    - startup_stm32f407vgtx.s
  - STM32F407VGTX_FLASH.ld
  - STM32F407VGTX_RAM.ld

Project menu:
- Open Project
- Close Project
- Build All Ctrl+B
- Build Configurations
- Build Project
- Build Working Set
- Clean...
- Build Automatically
- Build Targets
- C/C++ Index
- Generate Report
- Generate Code
- Properties

```
/* USER CODE BEGIN Header */
/**
  ******************************************************************************
  * File Name          : main.c
  * Description        : Auto-generated by STM32CubeIDE
  * Description        : Main program body
  ******************************************************************************
  *
  * COPYRIGHT(c) 2022 STMicroelectronics.
  * All rights reserved.
  *
  * This software is licensed under terms that can be found in the LICENSE file
  * in the root directory of this software component.
  * If no LICENSE file comes with this software, it is provided AS-IS.
  *
  ******************************************************************************
 */

#include <stdint.h>
#include <stdio.h>

#if !defined(__SOFT_FP__) && defined(__ARM_FP)
  #warning "FPU is not initialized, but the project is compiling for an FPU. Please initialize the FPU before use."
#endif

int main(void)
{
    printf("Hello STM32!\n");
    printf("Hello DESD!\n");
    printf("God Bless You!\n");
}
```

Outline
- stdint.h
- stdio.h
- main(void) : int

Build Targets

Problems Tasks Console Properties
0 items
Description Resource Path Location

Build Analyzer Static Stack Analyzer
Memory Regions Memory Details
Region Start address End address Size Free Used Usage (%

Writable Smart Insert 30 : 32 : 968

ARM_Demos - gpio1/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

(no launch history)
Debug As
Debug Configurations...
Organize Favorites...

Project Explorer
- basic
- gpio1
  - Binaries
  - Includes
  - Inc
    - cmsis_compiler.h
    - cmsis_gcc.h
    - cmsis_version.h
    - core_cm4.h
    - mpu_armv7.h
    - stm32f407xx.h
    - stm32f4xx.h
    - system_stm32f4xx.h
  - Src
    - itm.c
    - main.c
    - syscalls.c
    - sysmem.c
    - system_stm32f4xx.c
  - Startup
    - startup_stm32f407vgtx.s
  - Debug
  - STM32F407VGTX_FLASH.ld
  - STM32F407VGTX_RAM.ld

```
 5  * @brief          : Main program body
 6  ******************************************************************************
 7  * @attention
 8  *
 9  * Copyright (c) 2022 STMicroelectronics.
10  * All rights reserved.
11  *
12  * This software is licensed under terms that can be found in the LICENSE file
13  * in the root directory of this software component.
14  * If no LICENSE file comes with this software, it is provided AS-IS.
15  *
16  ******************************************************************************
17  */
18
19 #include <stdint.h>
20 #include <stdio.h>
21
22 #if !defined(__SOFT_FP__) && defined(__ARM_FP)
23   #warning "FPU is not initialized, but the project is compiling for an FPU. Please initialize the FPU before use."
24 #endif
25
26 int main(void)
27 {
28     printf("Hello STM32!\n");
29     printf("Hello DESD!\n");
30     printf("God Bless You!\n");
31 }
32
33
```

Outline
- stdint.h
- stdio.h
- main(void) : int

Build Targets

Problems Tasks Console Properties

CDT Build Console [gpio1]

```
Finished building: default.size.stdout

Finished building: gpio1.list

22:08:12 Build Finished. 0 errors, 0 warnings. (took 318ms)
```

Build Analyzer Static Stack Analyzer

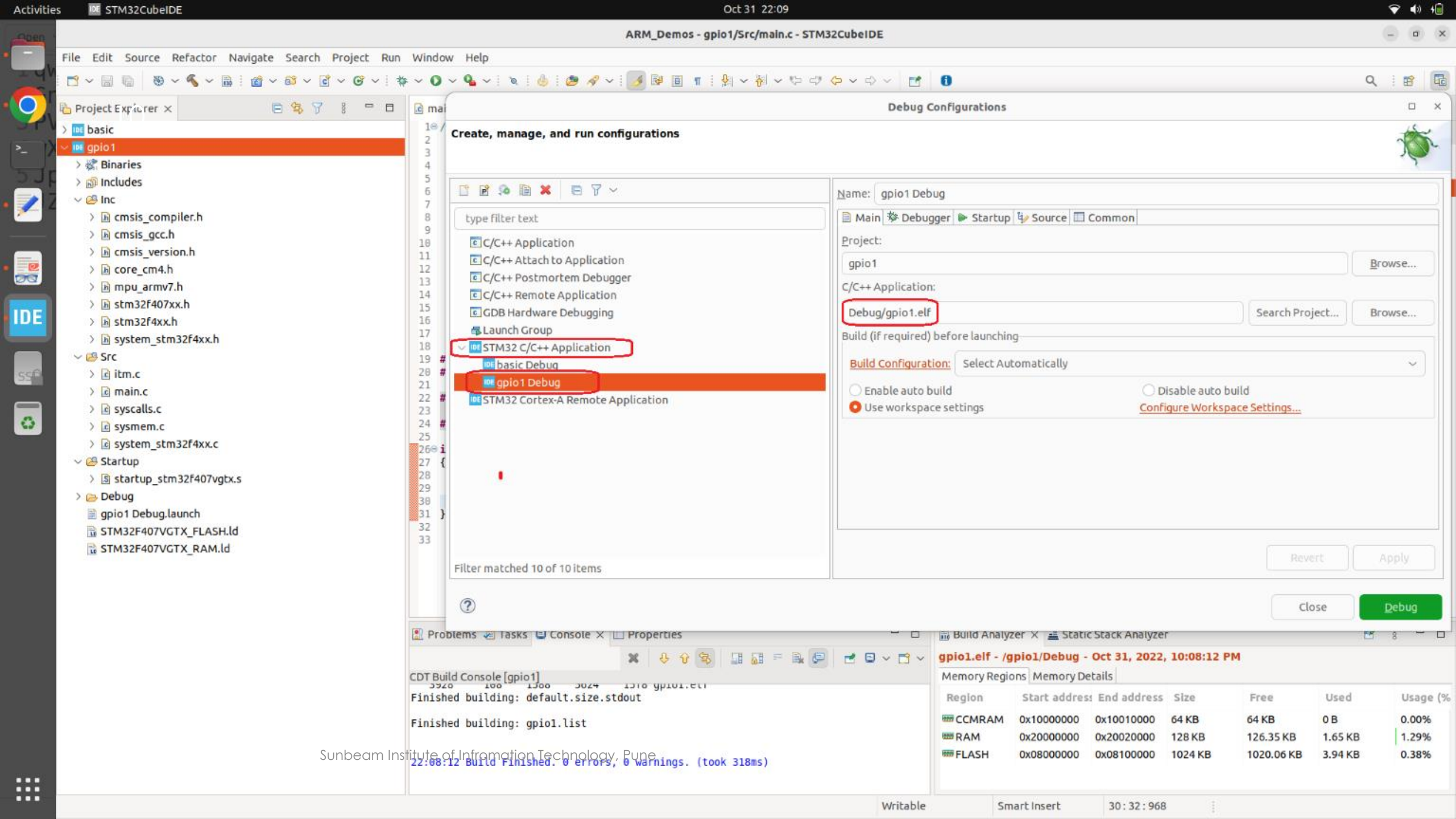
gpio1.elf - /gpio1/Debug - Oct 31, 2022, 10:08:12 PM

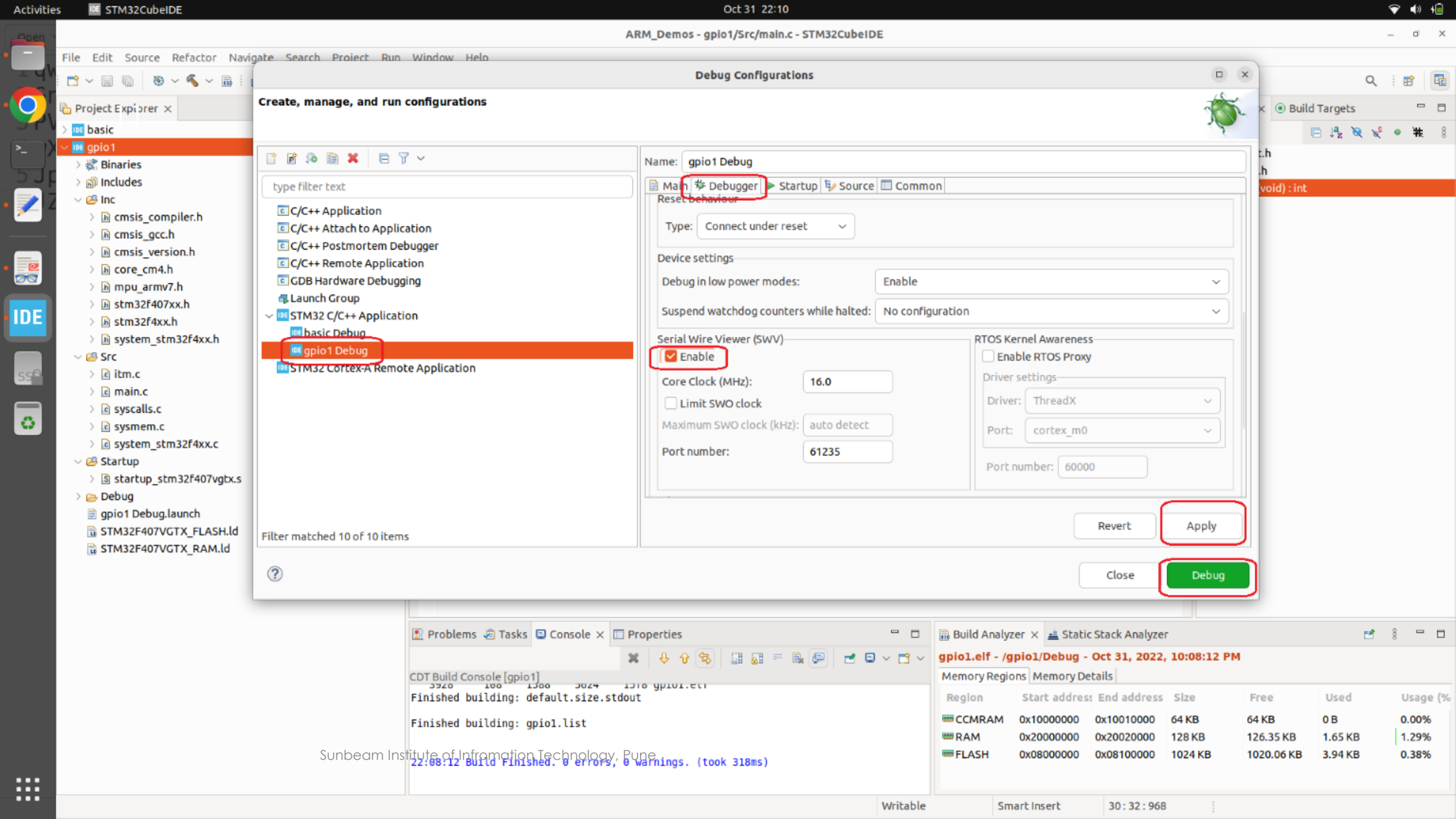
Memory Regions Memory Details

| Region | Start address | End address | Size | Free | Used | Usage (% |
|---|---|---|---|---|---|---|
| CCMRAM | 0x10000000 | 0x10010000 | 64 KB | 64 KB | 0 B | 0.00% |
| RAM | 0x20000000 | 0x20020000 | 128 KB | 126.35 KB | 1.65 KB | 1.29% |
| FLASH | 0x08000000 | 0x08100000 | 1024 KB | 1020.06 KB | 3.94 KB | 0.38% |



Writable Smart Insert 30 : 32 : 968




Activities
STM32CubeIDE
Oct 31 22:10
ARM_Demos - gpio1/Src/main.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
basic
gpio1
Binaries
Includes
Inc
cmsis_compiler.h
cmsis_gcc.h
cmsis_version.h
core_cm4.h
mpu_armv7.h
stm32f407xx.h
stm32f4xx.h
system_stm32f4xx.h
Src
itm.c
main.c
syscalls.c
sysmem.c
system_stm32f4xx.c
Startup
startup_stm32f407vgtx.s
Debug
gpio1 Debug.launch
STM32F407VGTX_FLASH.ld
STM32F407VGTX_RAM.ld
Debug Configurations
Create, manage, and run configurations
type filter text
C/C++ Application
C/C++ Attach to Application
C/C++ Postmortem Debugger
C/C++ Remote Application
GDB Hardware Debugging
Launch Group
STM32 C/C++ Application
basic Debug
gpio1 Debug
STM32 Cortex-A Remote Application
Filter matched 10 of 10 items
Name: gpio1 Debug
Main
Debugger
Startup
Source
Common
Reset behaviour
Type: Connect under reset
Device settings
Debug in low power modes: Enable
Suspend watchdog counters while halted: No configuration
Serial Wire Viewer (SWV)
Enable
Core Clock (MHz): 16.0
Limit SWO clock
Maximum SWO clock (kHz): auto detect
Port number: 61235
RTOS Kernel Awareness
Enable RTOS Proxy
Driver settings
Driver: ThreadX
Port: cortex_m0
Port number: 60000
Revert
Apply
Close
Debug
Build Targets
Problems
Tasks
Console
Properties
CDT Build Console [gpio1]
Finished building: default.size.stdout
Finished building: gpio1.list
22:08:12 Build Finished. 0 errors, 0 warnings. (took 318ms)
Build Analyzer
Static Stack Analyzer
gpio1.elf - /gpio1/Debug - Oct 31, 2022, 10:08:12 PM
Memory Regions
Memory Details
Region Start address End address Size Free Used Usage (%
CCMRAM 0x10000000 0x10010000 64 KB 64 KB 0 B 0.00%
RAM 0x20000000 0x20020000 128 KB 126.35 KB 1.65 KB 1.29%
FLASH 0x08000000 0x08100000 1024 KB 1020.06 KB 3.94 KB 0.38%
Writable
Smart Insert
30 : 32 : 968
Sunbeam Institute of Information Technology, Pune

ARM_Demos - gpio1/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- basic
- gpio1
  - Binaries
  - Includes
  - Inc
    - cmsis_compiler.h
    - cmsis_gcc.h
    - cmsis_version.h
    - core_cm4.h
    - mpu_armv7.h
    - stm32f407xx.h
    - stm32f4xx.h
    - system_stm32f4xx.h
  - Src
    - itm.c
    - main.c
    - syscalls.c
    - sysmem.c
    - system_stm32f4xx.c
  - Startup
    - startup_stm32f407vgtx.s
  - Debug
  - gpio1 Debug.launch
  - STM32F407VGTX_FLASH.ld
  - STM32F407VGTX_RAM.ld

main.c

```
/**
 ******************************************************************************
 * @file           : main.c
 * @author         : Auto-generated by STM32CubeIDE
 * @brief          : Main program body
 ******************************************************************************
 * @attention
 *
 * Copyright (c) 2022 STMicroelectronics.
 * All rights reserved.
 *
 * This software is licensed under terms that can be found in the LICENSE file
 * in the root directory of this software component.
 * If no LICEN
 *
 ************
 */

#include <stdi
#include <stdi

#if !defined(_
  #warning "FP                                    lize the FPU before use."
#endif

int main(void)
{
    printf("He
    printf("He
    printf("God Bless You!\n");
}
```

Confirm Perspective Switch

This kind of launch is configured to open the Debug perspective when it suspends.

This Debug perspective supports application debugging by providing views for displaying the debug stack, variables and breakpoints.

Switch to this perspective?

Remember my decision

No Switch

Outline

- stdint.h
- stdio.h
- main(void) : int

Build Targets

Problems Tasks Console Properties

gpio1 Debug [STM32 C/C++ Application] [pid: 12047]

```
Download verified successfully
```

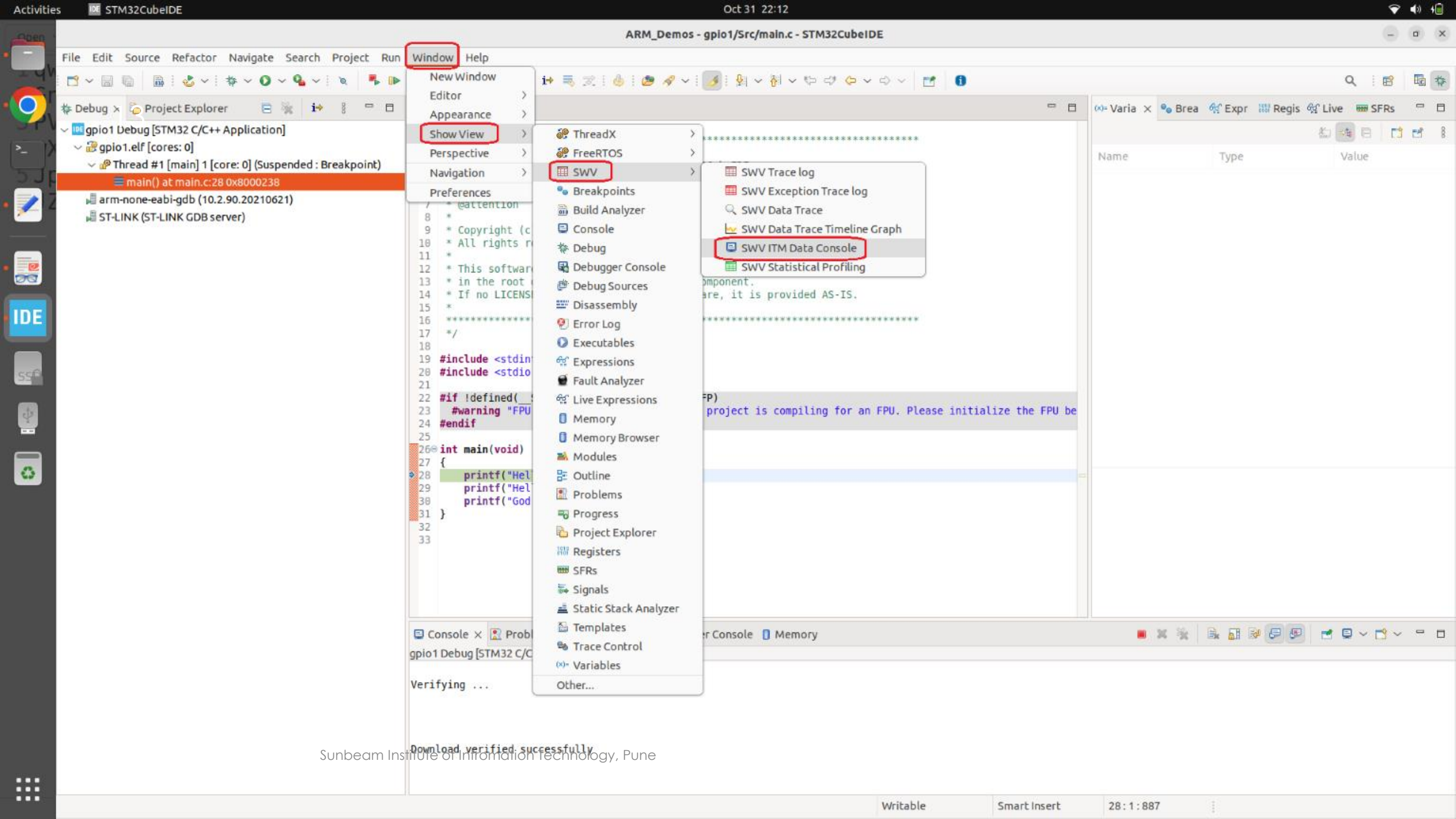
Build Analyzer Static Stack Analyzer

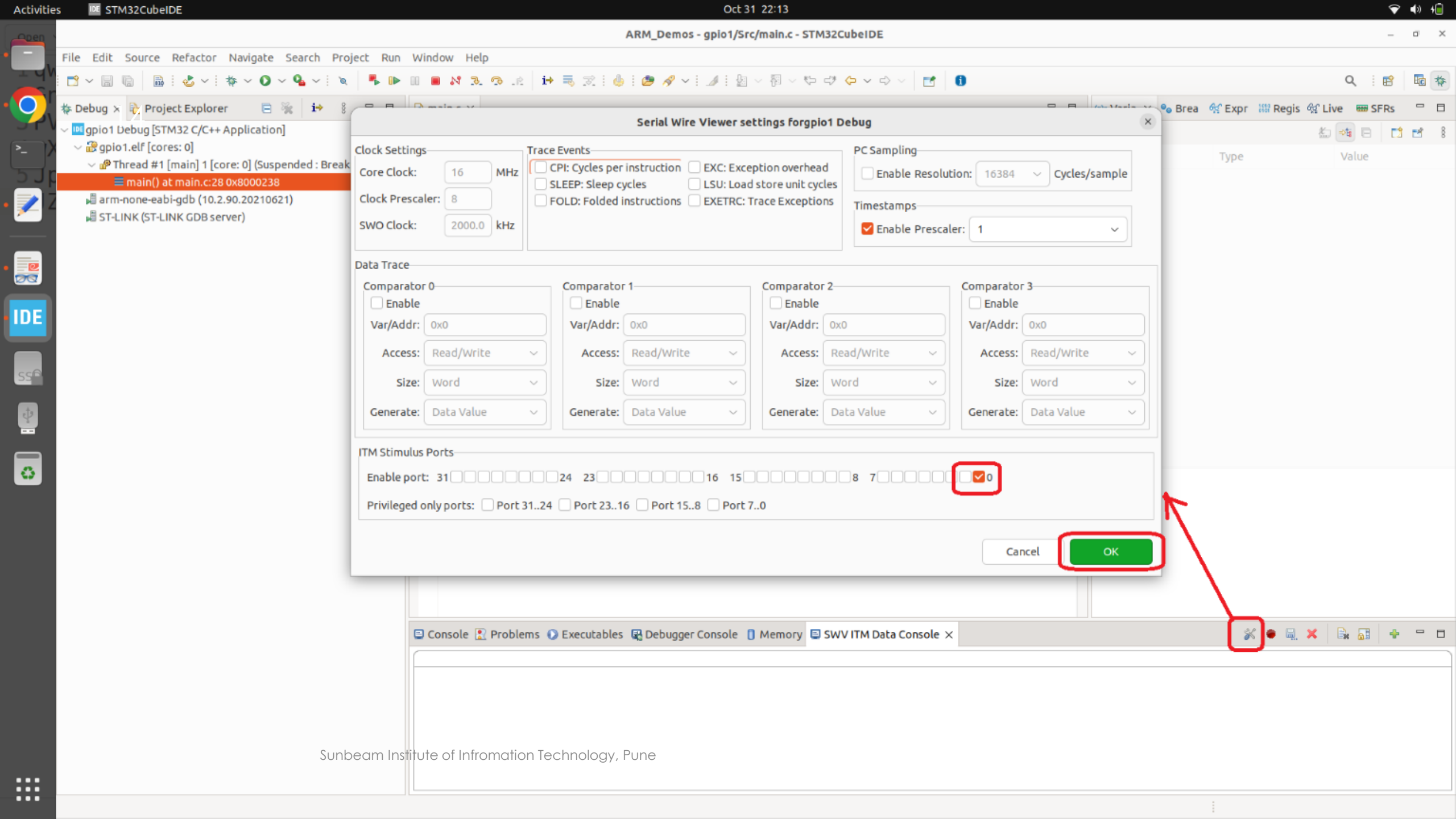
gpio1.elf - /gpio1/Debug - Oct 31, 2022, 10:08:12 PM

Memory Regions Memory Details

| Region | Start address | End address | Size | Free | Used | Usage (% |
|---|---|---|---|---|---|---|
| CCMRAM | 0x10000000 | 0x10010000 | 64 KB | 64 KB | 0 B | 0.00% |
| RAM | 0x20000000 | 0x20020000 | 128 KB | 126.35 KB | 1.65 KB | 1.29% |
| FLASH | 0x08000000 | 0x08100000 | 1024 KB | 1020.06 KB | 3.94 KB | 0.38% |

Writable Smart Insert 30 : 32 : 968


Activities
STM32CubeIDE
Oct 31 22:12
ARM_Demos - gpio1/Src/main.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
New Window
Editor
Appearance
Show View
Perspective
Navigation
Preferences
ThreadX
FreeRTOS
SWV
Breakpoints
Build Analyzer
Console
Debug
Debugger Console
Debug Sources
Disassembly
Error Log
Executables
Expressions
Fault Analyzer
Live Expressions
Memory
Memory Browser
Modules
Outline
Problems
Progress
Project Explorer
Registers
SFRs
Signals
Static Stack Analyzer
Templates
Trace Control
Variables
Other...
SWV Trace log
SWV Exception Trace log
SWV Data Trace
SWV Data Trace Timeline Graph
SWV ITM Data Console
SWV Statistical Profiling
Debug
Project Explorer
gpio1 Debug [STM32 C/C++ Application]
gpio1.elf [cores: 0]
Thread #1 [main] 1 [core: 0] (Suspended : Breakpoint)
main() at main.c:28 0x8000238
arm-none-eabi-gdb (10.2.90.20210621)
ST-LINK (ST-LINK GDB server)
Name
Type
Value
Console
Memory
Verifying ...
Download verified successfully
Writable
Smart Insert
28 : 1 : 887


Activities
STM32CubeIDE
Oct 31 22:13
ARM_Demos - gpio1/Src/main.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
Project Explorer
gpio1 Debug [STM32 C/C++ Application]
gpio1.elf [cores: 0]
Thread #1 [main] 1 [core: 0] (Suspended : Break
main() at main.c:28 0x8000238
arm-none-eabi-gdb (10.2.90.20210621)
ST-LINK (ST-LINK GDB server)
Serial Wire Viewer settings forgpio1 Debug
Clock Settings
Core Clock: 16 MHz
Clock Prescaler: 8
SWO Clock: 2000.0 kHz
Trace Events
CPI: Cycles per instruction
EXC: Exception overhead
SLEEP: Sleep cycles
LSU: Load store unit cycles
FOLD: Folded instructions
EXETRC: Trace Exceptions
PC Sampling
Enable Resolution: 16384 Cycles/sample
Timestamps
Enable Prescaler: 1
Data Trace
Comparator 0
Comparator 1
Comparator 2
Comparator 3
Enable
Var/Addr: 0x0
Access: Read/Write
Size: Word
Generate: Data Value
ITM Stimulus Ports
Enable port: 31 24 23 16 15 8 7 0
Privileged only ports: Port 31..24 Port 23..16 Port 15..8 Port 7..0
Cancel
OK
Console Problems Executables Debugger Console Memory SWV ITM Data Console
Type
Value

ARM_Demos - gpio1/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Debug | Project Explorer

- gpio1 Debug [STM32 C/C++ Application]
  - gpio1.elf [cores: 0]
    - Thread #1 [main] 1 [core: 0] (Suspended : Step)
      - main() at main.c:31 0x800024c
    - arm-none-eabi-gdb (10.2.90.20210621)
    - ST-LINK (ST-LINK GDB server)

main.c

```c
/**
  ******************************************************************************
  * @file           : main.c
  * @author         : Auto-generated by STM32CubeIDE
  * @brief          : Main program body
  ******************************************************************************
  * @attention
  *
  * Copyright (c) 2022 STMicroelectronics.
  * All rights reserved.
  *
  * This software is licensed under terms that can be found in the LICENSE file
  * in the root directory of this software component.
  * If no LICENSE file comes with this software, it is provided AS-IS.
  *
  ******************************************************************************
  */

#include <stdint.h>
#include <stdio.h>

#if !defined(__SOFT_FP__) && defined(__ARM_FP)
  #warning "FPU is not initialized, but the project is compiling for an FPU. Please initialize the FPU be
#endif

int main(void)
{
    printf("Hello STM32!\n");
    printf("Hello DESD!\n");
    printf("God Bless You!\n");
}
```

Varia | Brea | Expr | Regis | Live | SFRs

Name | Type | Value

Console | Problems | Executables | Debugger Console | Memory | SWV ITM Data Console

Port 0

```
Hello STM32!
Hello DESD!
God Bless You!
```



Writable | Smart Insert | 31 : 1 : 969

# Thank you

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