Uvod v Vitis

projekt, prevajanje, razhroščevanje aplikacija

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UNIVERZA V LJUBLJANI

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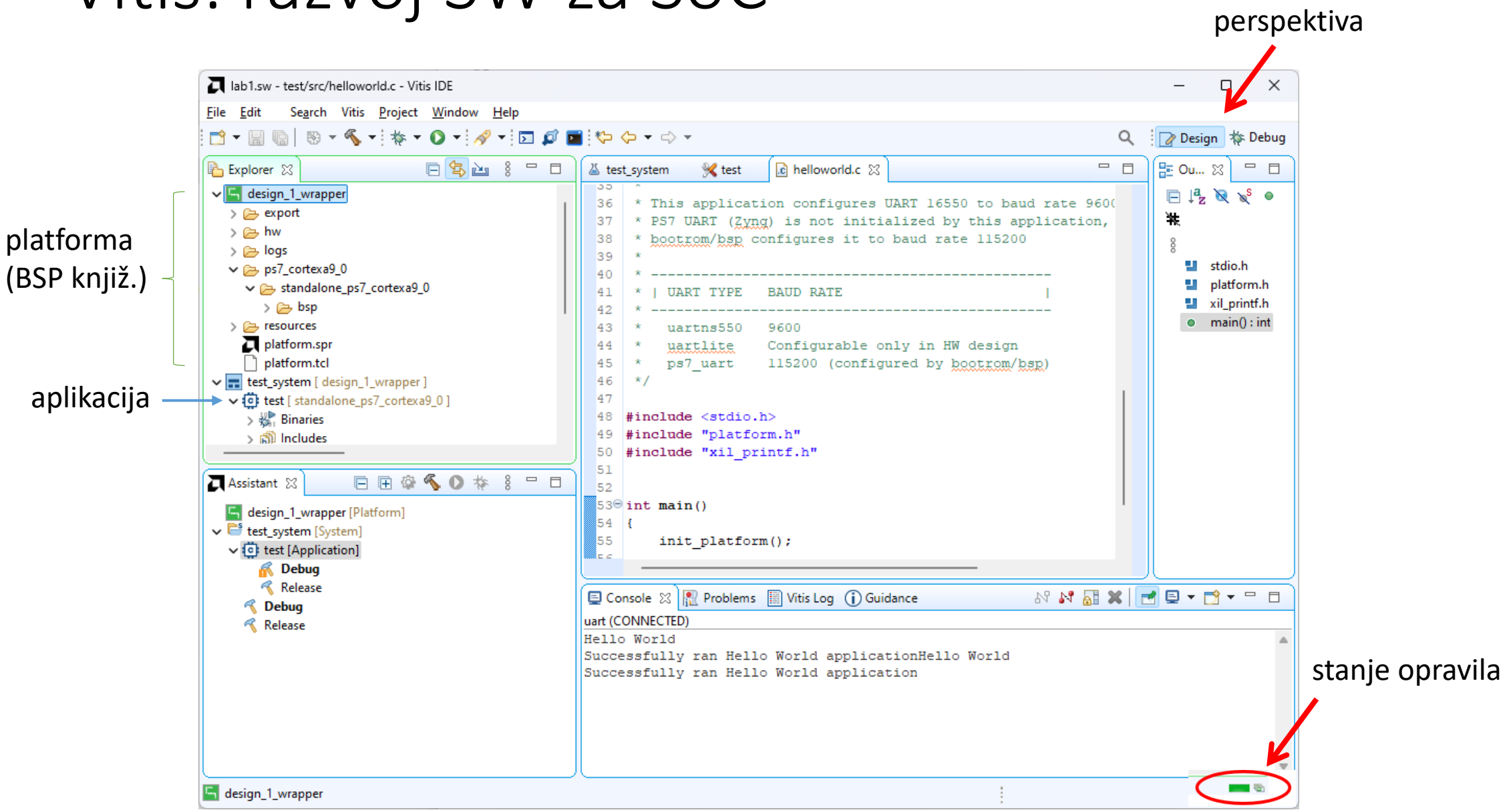
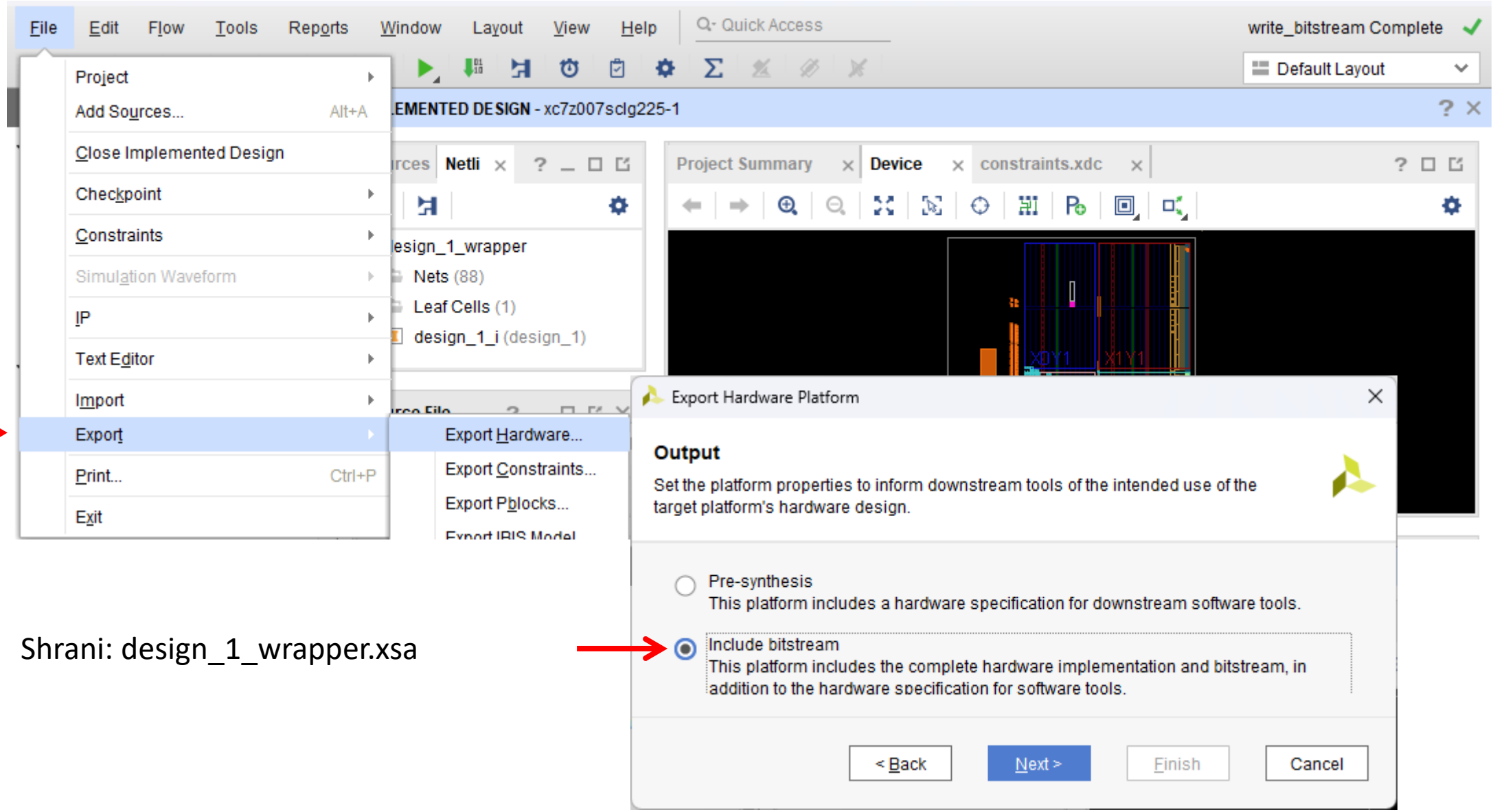
Vitis: razvoj SW za SoC



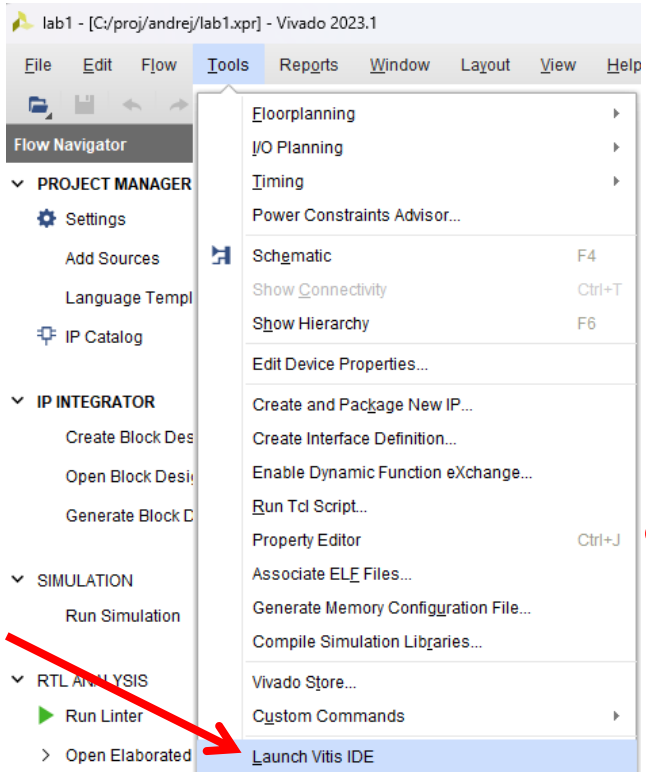
Izvozi opis HW iz orodja Vivado



Shrani: design_1_wrapper.xsa

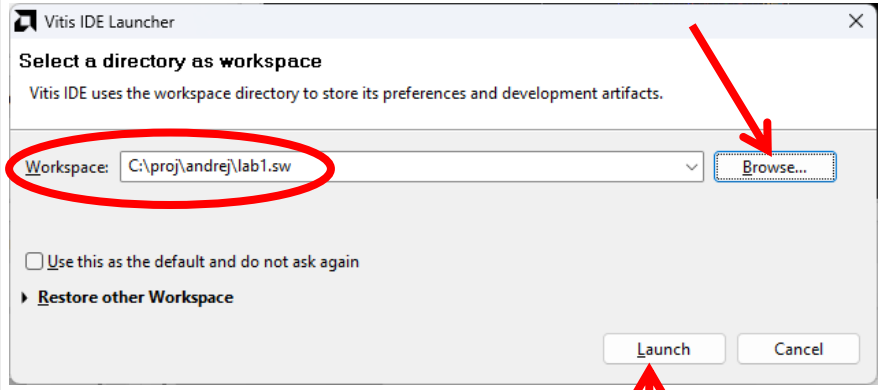
Vitis IDE

1.



Naredi novo mapo znotraj projekta, npr. lab1.sw

2.



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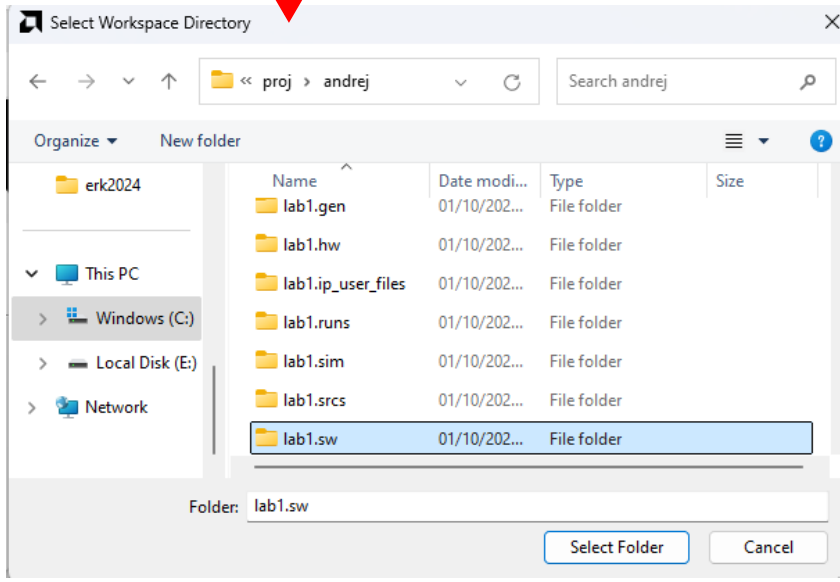
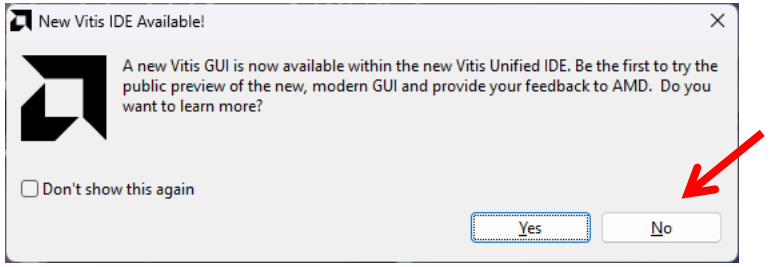


4.

5.



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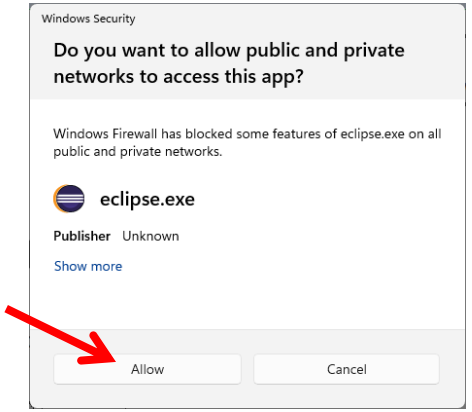
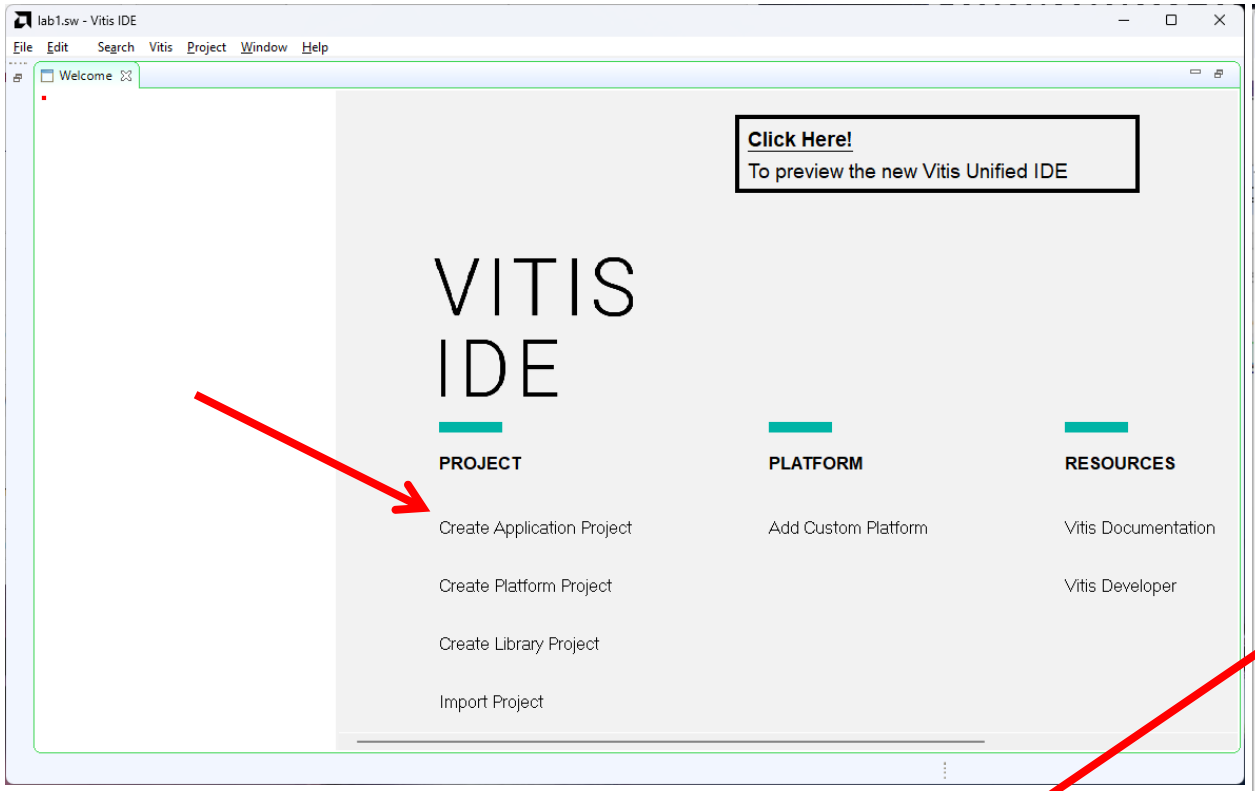
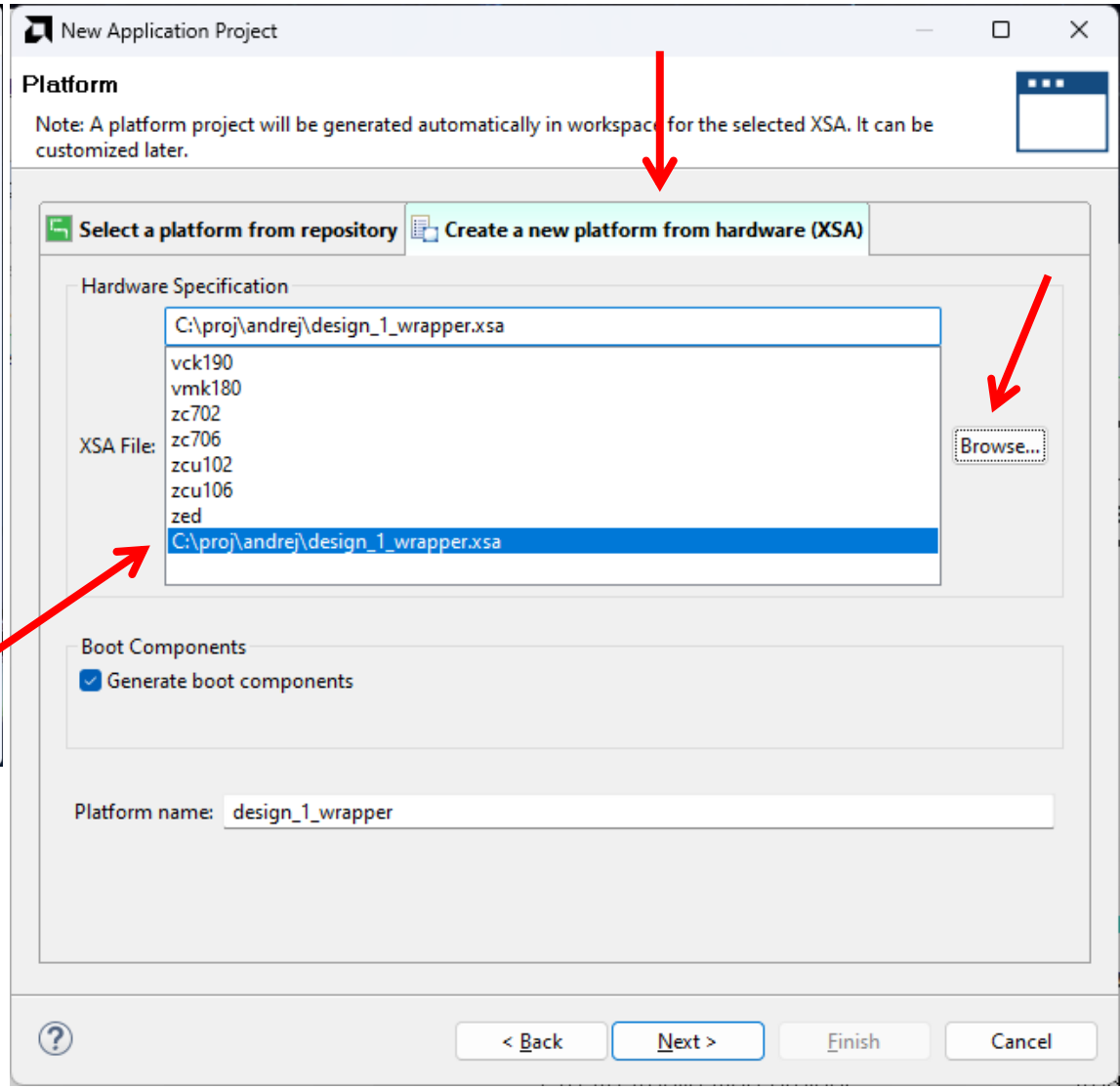


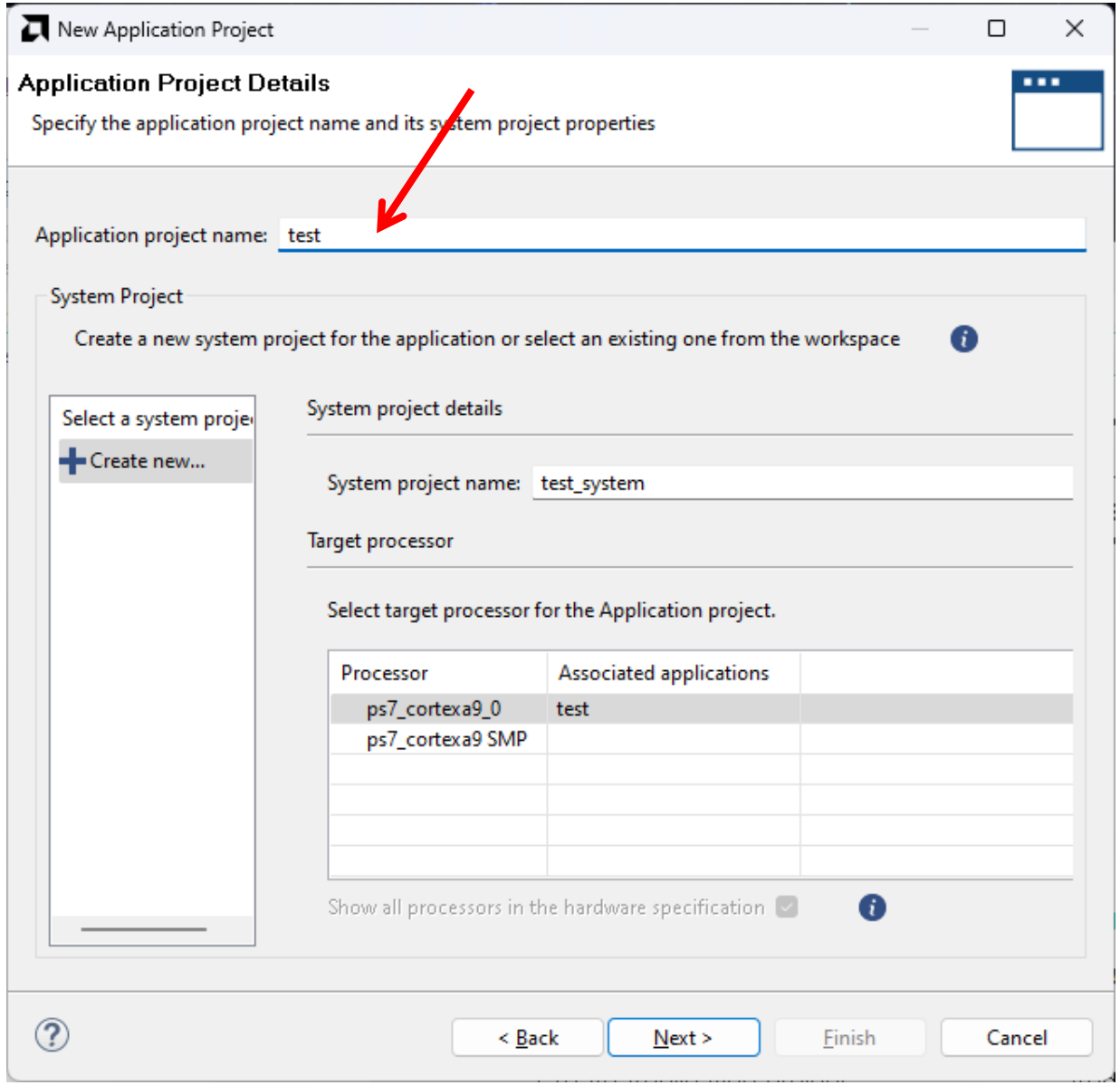
Nov Vitis projekt: 1. korak - izbira platforme





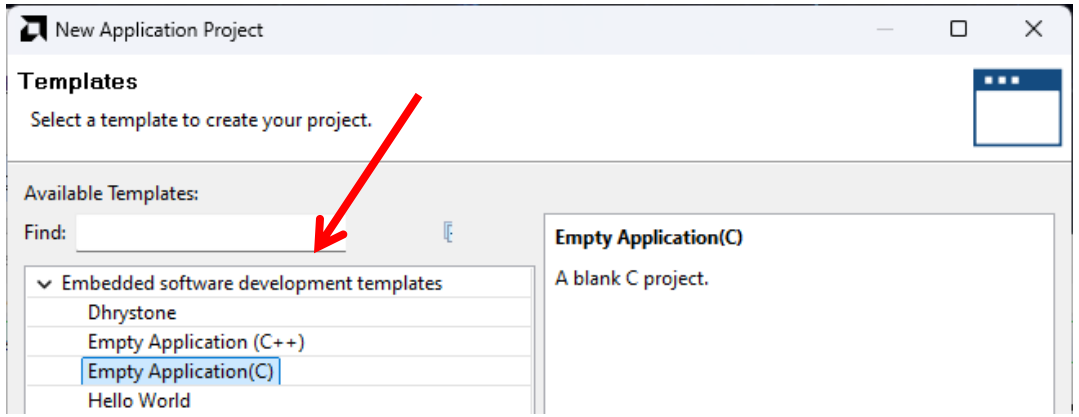
Poiščemo na disku: design_1_wrapper.xsa

2., 3. in 4. korak izdelave projekta

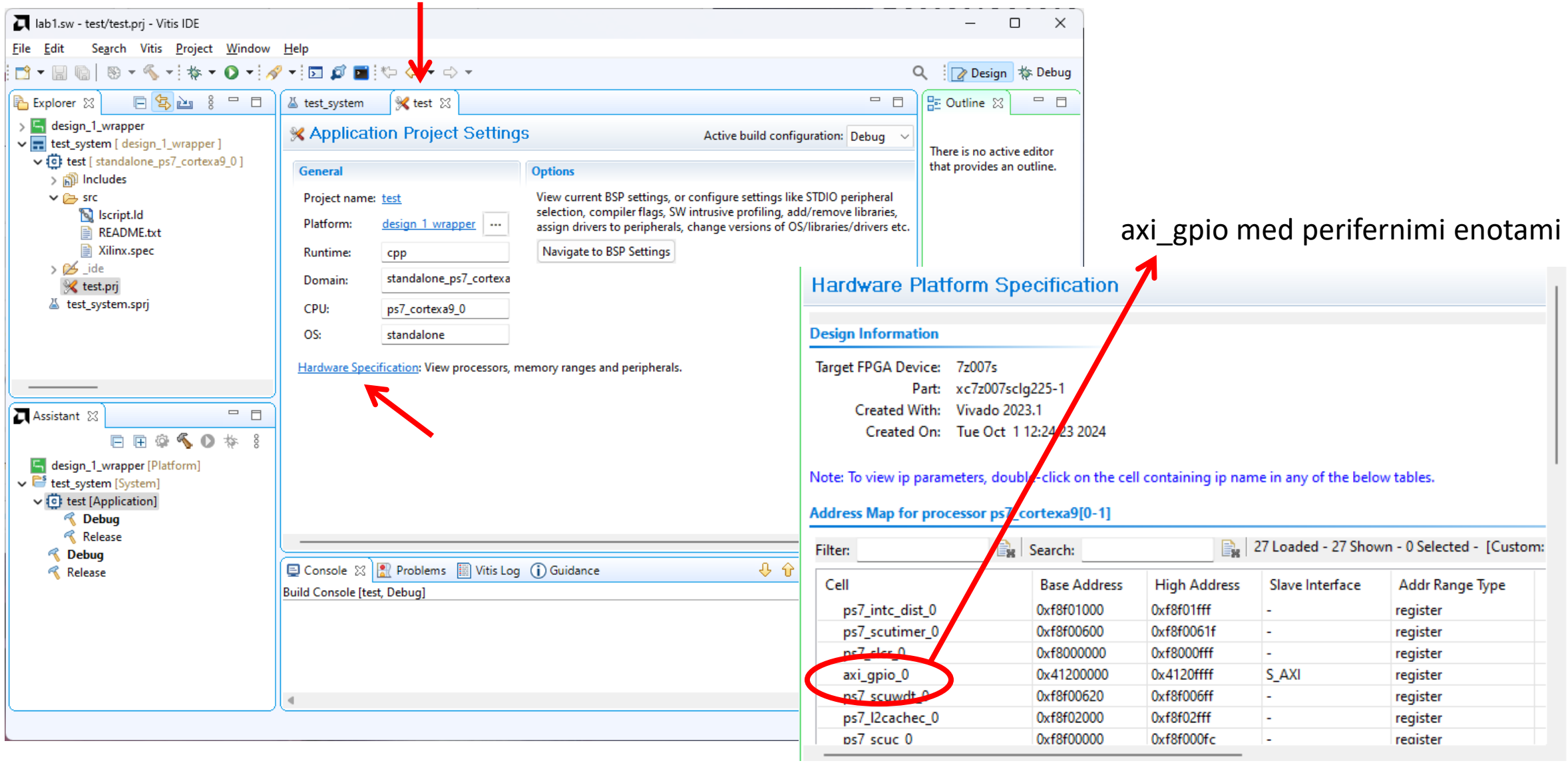


3. korak, Domain le potrdimo privzeto

4. korak, Templates izberemo Empty Application
ali pa Hello World

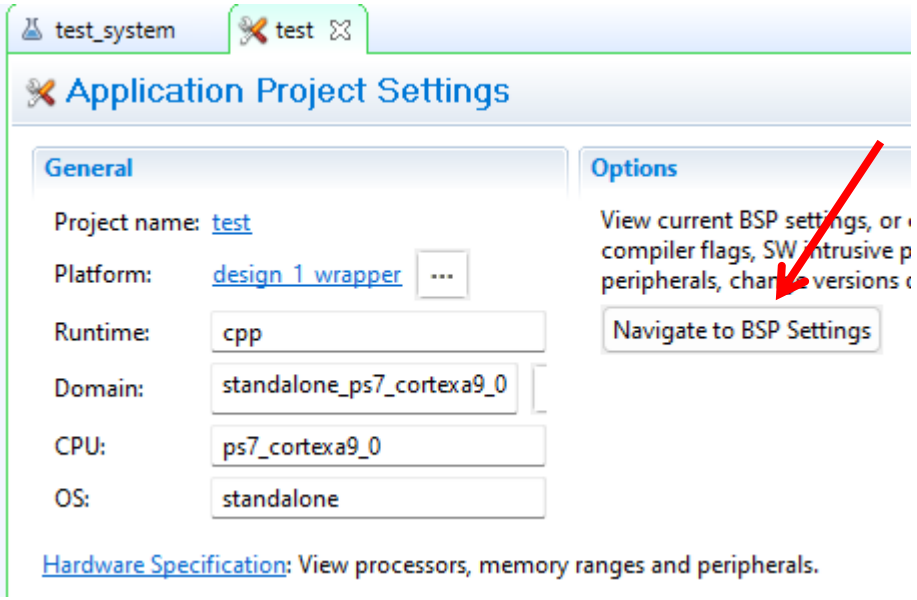


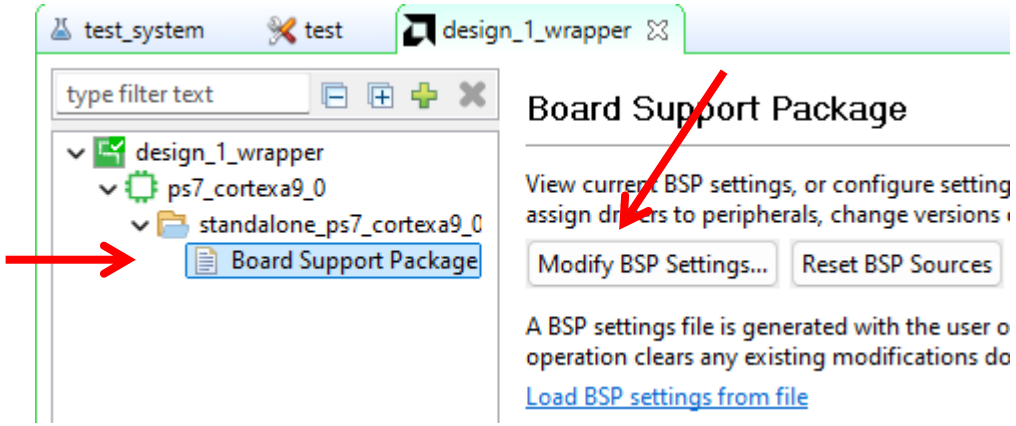
Pregled nastavitev platforme

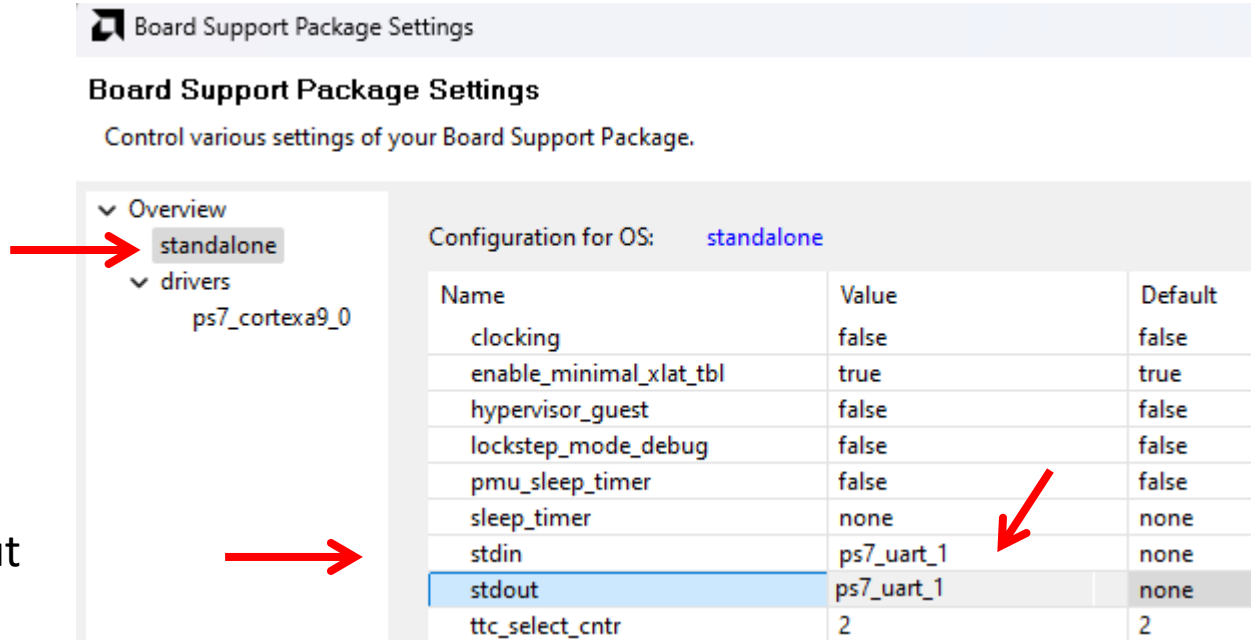


axi_gpio med perifernimi enotami

Opcija: nastavitev BSP (UART1 na MiniZed)





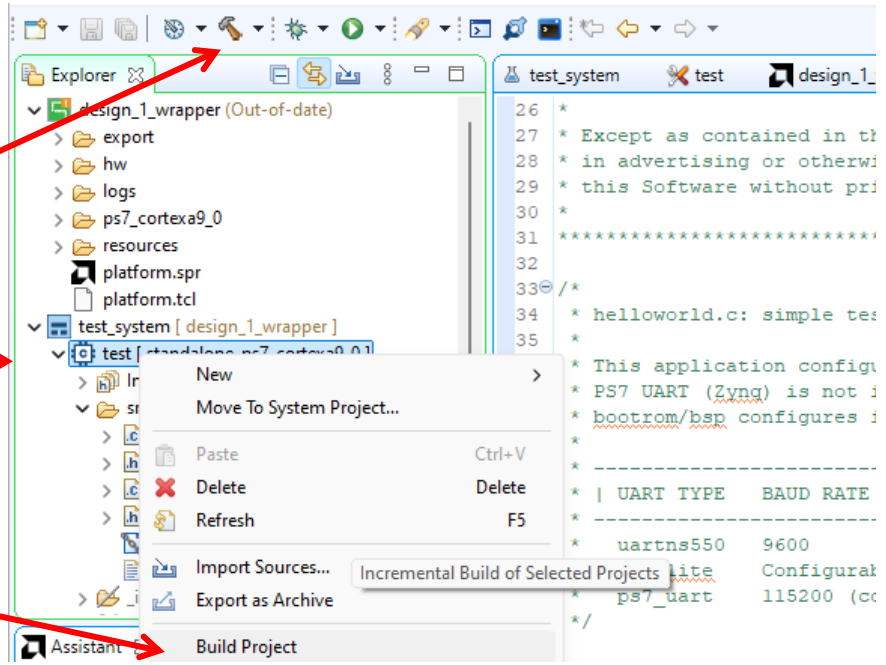


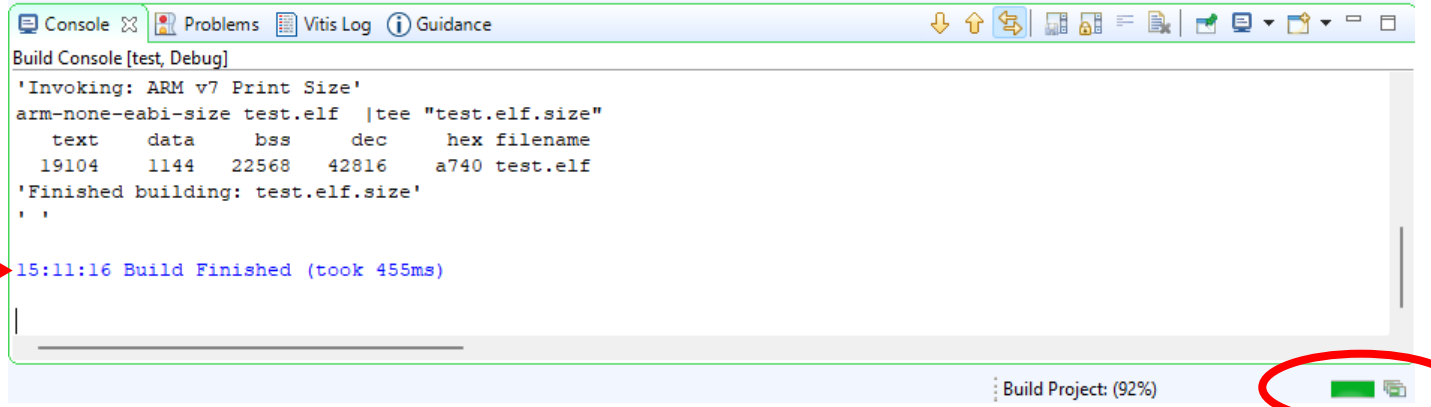
Določi uart_1 za stdin/stdout

Prevajanje aplikacije

Okno Explorer

- izberi aplikacijo
- Build Project
- preveri rezultat v konzoli





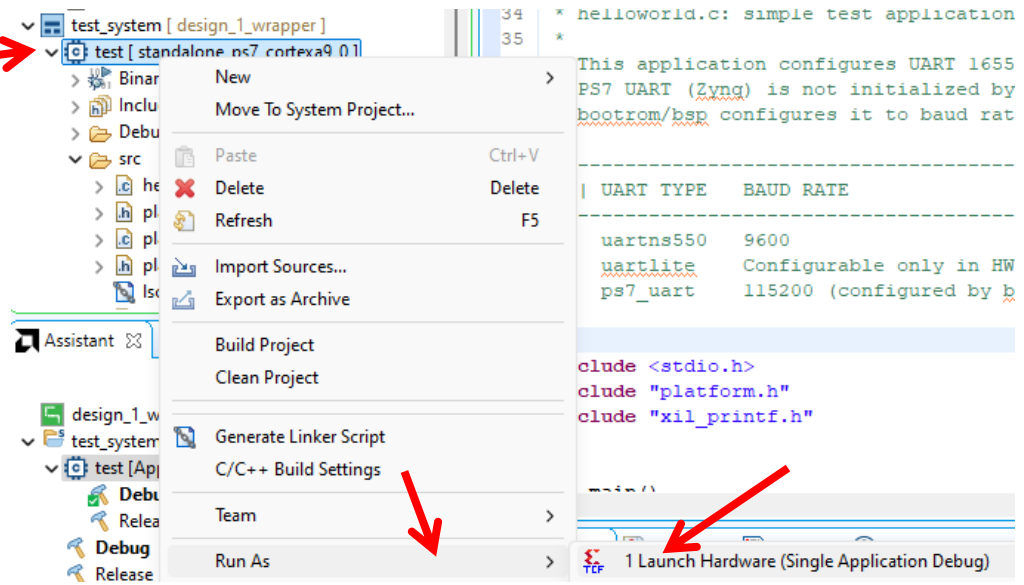
Prenos in zagon na razvojni plošči

MiniZed povezan na USB

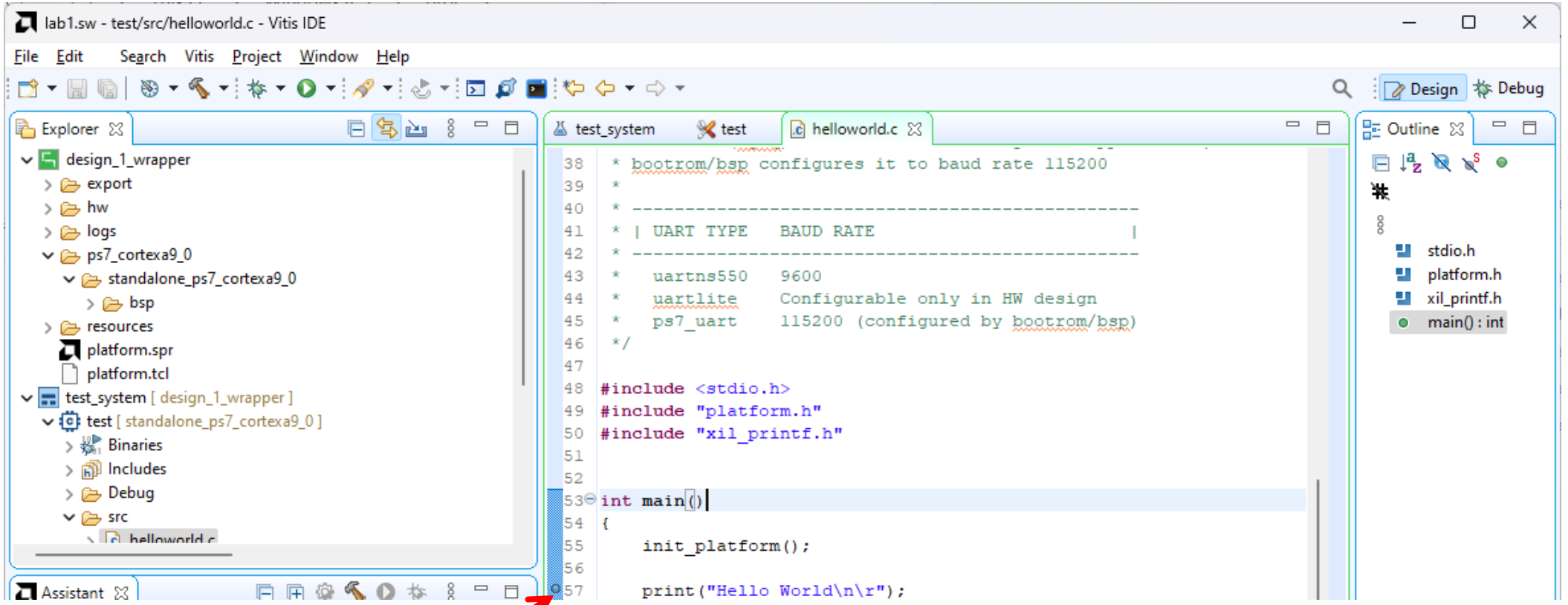
- izberi aplikacijo
- Run As
  - 1. Launch Hardware

Razhroščevanje

- Debug As
  - 1. Launch Hardware
- Izvajanje po korakih
  - npr. Step Over (F6)

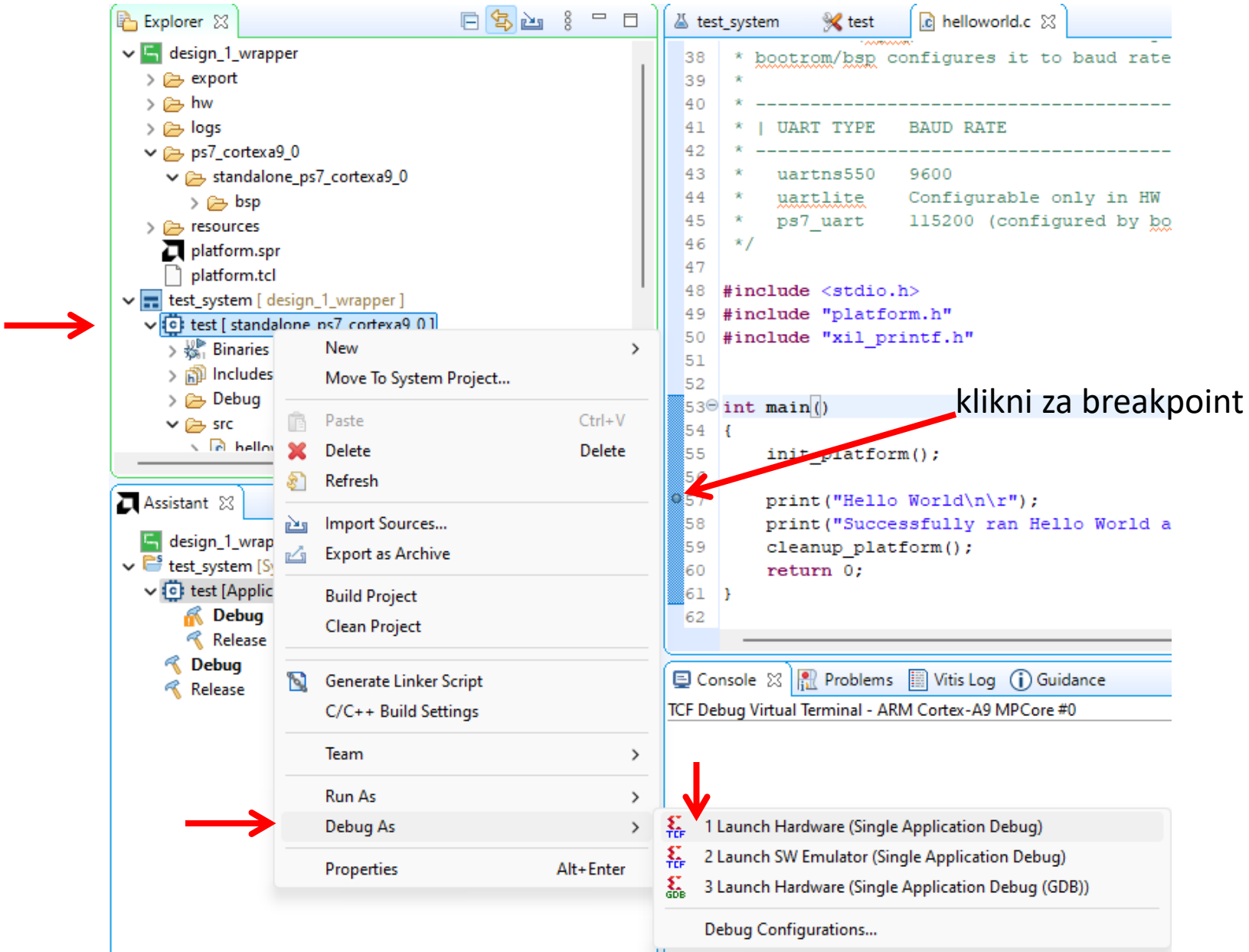


Razhroščevanje

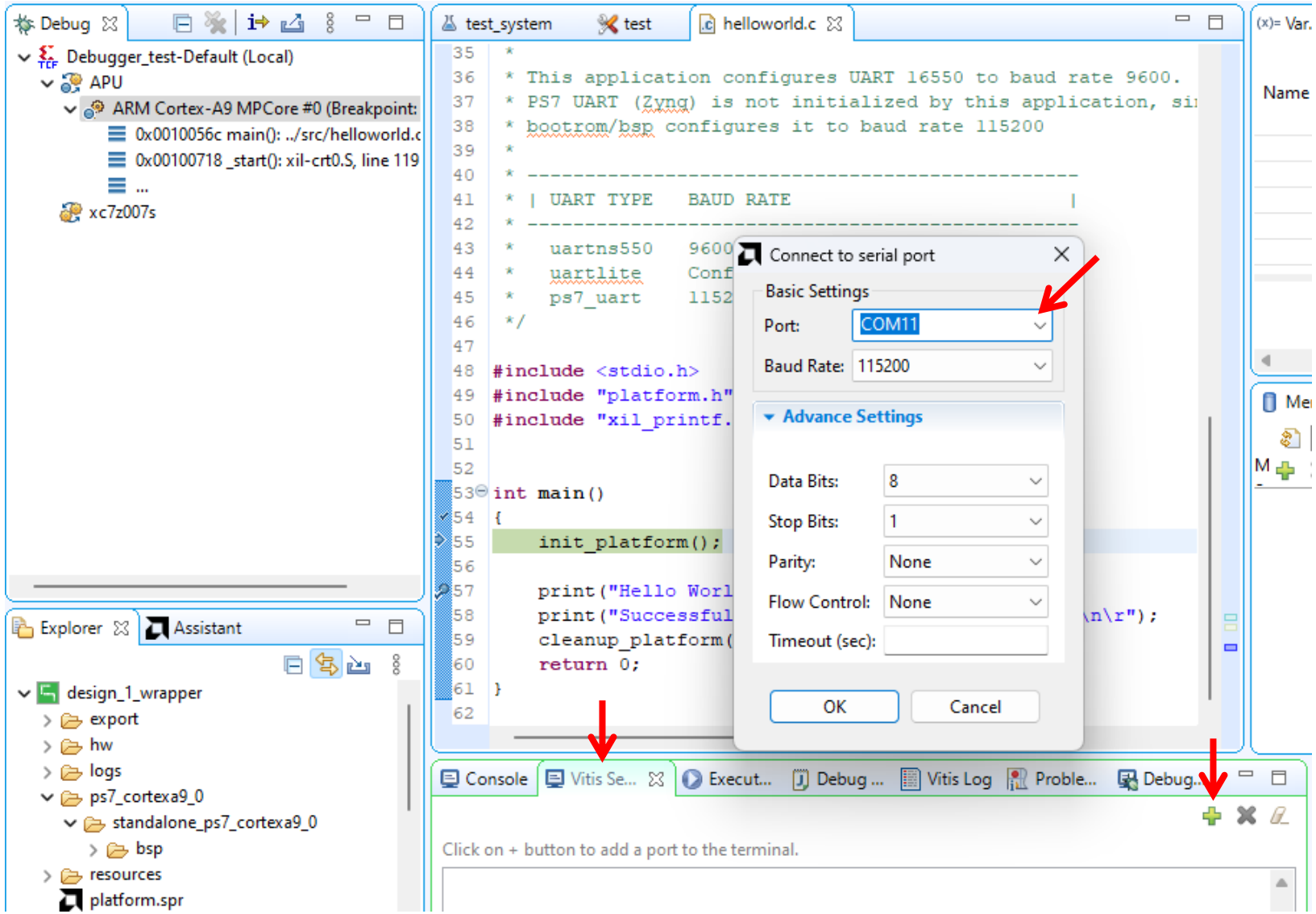


klikni za breakpoint

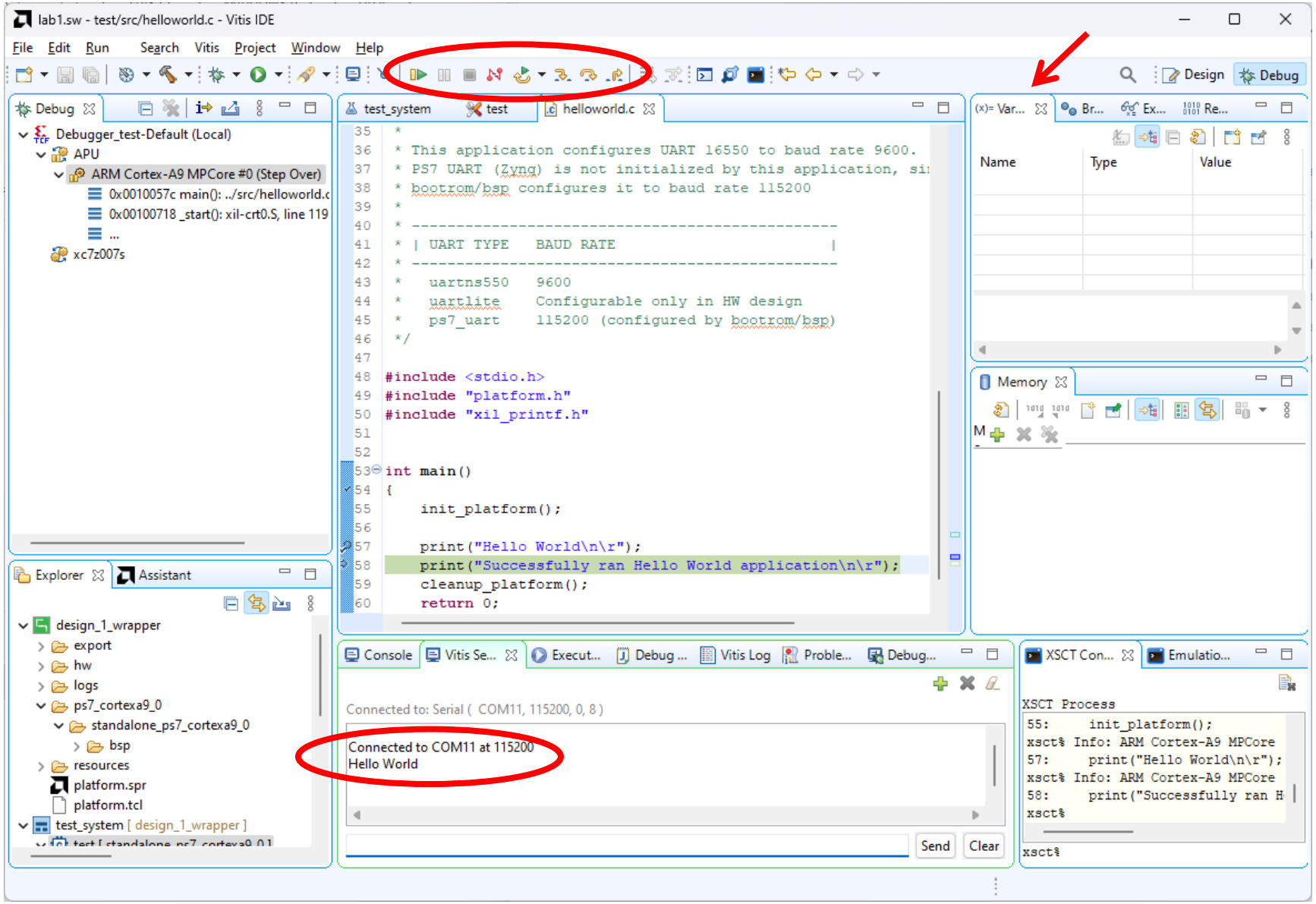
Razhroščevanje



Za UART nastavi terminal

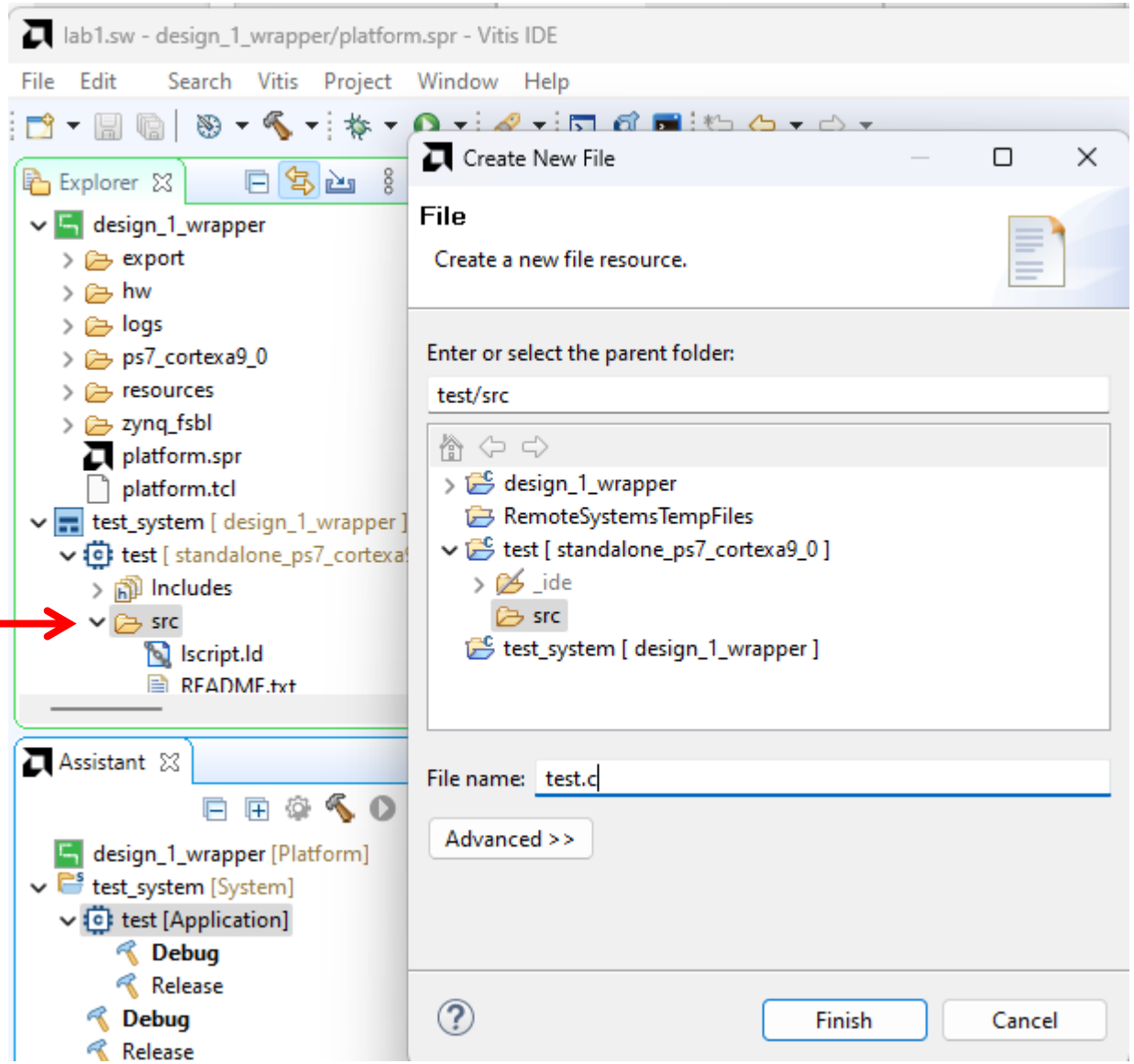


Izvajanje po korakih



Nova izvorna datoteka

New, File



Aplikacija – dostop do registrov PL

Dostop s kazalci:

```
int *xp=(int *)0x41200000;
*xp=255;
```

Hardware Platform Specification

Design Information

Target FPGA Device: 7z007s
Part: xc7z007sclg225-1
Created With: Vivado 2023.1
Created On: Tue Oct 1 12:24:23 2024

Note: To view ip parameters, double-click on the cell containing ip name in any of the below tables.

Address Map for processor ps7_cortexa9[0-1]

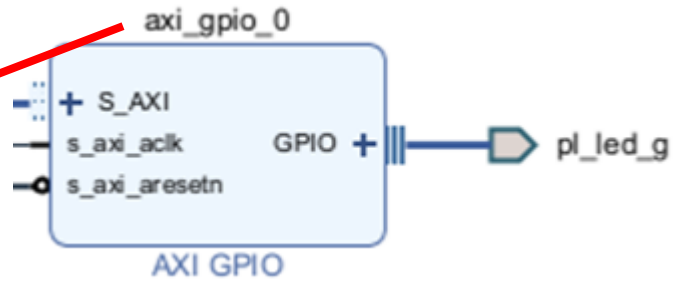
Filter: Search: 27 Loaded - 27 Shown - 0 Selected - [Custom:

Cell	Base Address	High Address	Slave Interface	Addr Range Type
ps7_intc_dist_0	0xf8f01000	0xf8f01fff	-	register
ps7_scutimer_0	0xf8f00600	0xf8f0061f	-	register
ps7_slcr_0	0xf8000000	0xf8000fff	-	register
axi_gpio_0	0x41200000	0x4120ffff	S_AXI	register
ps7_scuwdt_0	0xf8f00620	0xf8f006ff	-	register
ps7_l2cachec_0	0xf8f02000	0xf8f02fff	-	register
ps7_scuc_0	0xf8f00000	0xf8f000fc	-	register

Funkcije za AXI_GPIO (komponenta v FPGA)

```
#include "xgpio.h"

XGpio gpio;
XGpio_Initialize(&gpio, XPAR_AXI_GPIO_0_DEVICE_ID);
XGpio_DiscreteWrite(&gpio, 1, 0);
```



kanal vrednost

Funkcija za PS GPIO (enota ARM procesorja)

```
#include "xgpiops.h"

XGpioPs gpio_ps;
XGpioPs_Config *XGPIO_Config;
int btn;

 XGPIO_Config = XGpioPs_LookupConfig(XPAR_PS7_GPIO_0_DEVICE_ID);
 XGpioPs_CfgInitialize(&gpio_ps, XGPIO_Config, XGPIO_Config->BaseAddr);

 XGpioPs_SetDirectionPin(&gpio_ps, 0, 0);  // button
 XGpioPs_SetDirectionPin(&gpio_ps, 52, 1); // red
 XGpioPs_SetDirectionPin(&gpio_ps, 53, 1); // green

 XGpioPs_SetOutputEnablePin(&gpio_ps, 52, 1);
 XGpioPs_SetOutputEnablePin(&gpio_ps, 53, 1);

 XGpioPs_WritePin(&gpio_ps, 52, 1);
 XGpioPs_WritePin(&gpio_ps, 53, 0);

 btn = XGpioPs_ReadPin(&gpio_ps, 0);
```

inicializacija

nastavi smer

omogoči izhode

nastavi LED

beri tipko