How To create own BSP Layer in Yocto-project

BSP is a board support package which is a collection of information (meta-data) that defines how to support :-

1. A particular Hardware devices
2. Set of Devices
3. Hardware Platform.

All the board configuration data may be present in the (**meta-yocto-bsp/conf/machine/ * all machine configuration files).**

For example **I want to add meta-ti external bsp layer in my yocto project , How ?**

Meta-Ti is a bsp layer which is supported all embedded devices like beagle-bone-black embedded board.
Meta-Ti support various Hardware configuration supported layer

First clone this layer by using Git repository and this layer will be not clone in the poky folder , clone will be exit of poky folder with is same path.

Note :: Every layers depend on this things :-
OpenEmbedded-core,
Branch : master or working branch(for ex sumo, dunfell, nanbield, kirikstone)
Layer : meta

Now clone this layer :
$ git clone git://git.yoctoproject.org/meta-ti

Now enter the meta-ti folder
$ cd meta-ti/meta-ti-bsp

Now check the branch of your meta-ti folder
$ git branch

Note // it show you are on master branch but you have to switch your working branch which is used in poky(kirkstone)
So switch the current working branch same as poky
$ git checkout kirkstone

Now add this layer in the bblayer.conf file which is present in the build directory folder name as conf
Go to the build folder and set the build environment
$source oe-init-build-env ../build
$ cd conf
$ vi bblayers.conf

In this file show your three working layers which is used to build your image && this command also show your working layers in yocto-project in build directory.
$ bitbake-layers show-layers

You should add this meta-ti layer in your bblayer.conf file with manually or by command, manually means you will directly add the path of your meta-ti layer in this file and if you add this layer by command you will write this command

in build folder.

$ bitbake-layers add-layer ~/layer path/

Suppose my meta-ti layer present in this directory and want to add this layer in my build folder using command so you will enter add layer command in the build directory folder.

/home/arjun/Yocto-project/meta-ti >> " this path show my meta-ti layer "
In build folder :-

$ bitbake-layers add-layer ../meta-ti/meta-ti-bsp/

If you add this layer successfully so you will verify your layer will be added or not will using this command
$ bitbake-layers show-layers

It show all the layers which is added in the bblayers.conf files

you also check the machine name , how many machine name will be present in the meta-ti/conf/machine/
In this folder show various machine names to specify which machine will be build your image.

go to the build directory and enter conf folder

$ cd Build
$ conf
$ vi layer.conf

Now go to the machine architecture section and edit the machine name.
MACHINE ??= "qemux86-64"

qemux86-64 is a basic default machine but you will add your own machine name which is present in the meta-ti/conf/machine folder
suppose my machine name is beaglebone.conf this file will be present in this meta-ti machine folder

MACHINE ?= "beaglebone"

you should add only name of the machine beaglebone.conf not add **.conf** extension only add **beaglebone**

You should also confirm the machine architecture which is added in local.conf file is correct or nor by using this command.

$ bitbake –e core-image-minimal | grep ^MACHINE

Now time to Build the image

$ bitbake core-image-minimal

It takes around 2 to 3 hrs for build the image successfully**.**

Now check the output for your image which is present in **the tmp/depoy/images/beaglebone/**

After image is created in depoy folder and directly flash this image into the sd-card devices

Your image is :- **core-image-minimal-beaglebone.wic.xz**

First unzip this image
* All do and write this commands in image folder **:-**

$ unxz core-image-minimal-beaglebone.wic.xz

Note show the symbolic link type warning
$ ls core-image-minimal-beaglebone.wic.xz –al

finally the unzip the image file
$unxz core-image-minimal-beaglebone-202003141443953.rootfs.wic.xz

check the wic file
$ ls *.wic

To check the image partition
$ wic ls core-image-minimal-beaglebone-202003141443953.rootfs.wic

Now insert the sd-card in your linux host machine or to check card is insert or not
$ lsblk

** show sdb type devices this is your sd-card devices
** if you flash this image you should check first your sd-card do not have present any partition

Now use this command to copy all the image data as your sd-card

$ sudo dd if= core-image-minimal-beaglebone-202003141443953.rootfs.wic of=/dev/sdb status=progress bs=4096 && sync

if = input file, of = output file , bs = block size

Verify your data or partition will be created in your folder or not
$ lsblk

Also check partition manually for your sd-card

$ sudo fdisk /dev/sdb

enter p to check the partition table for your enter sd-card

check the processor your machine **$ nproc**
check the ram memory your machine **$ free –h**

Now insert this memory card into your beaglebone embedded board and run this image output using minicom to connect serial cable

$ sudo minicom –s

show all the image data and your image login window and complete this following process.

challenege :: if I build my image to remove meta-yocto-bsp and only add own bsp layer so image will be build or not.