Development Practice of Casting Foundation Parts Database

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Abstract: This project is in response to the promotion of enterprises using digital technology to transform traditional process equipment and production lines. So we carried out secondary development of UG, including the implementation of points, lines, surfaces, and bodies, as well as the creation of menus and toolbars. Using Grip programming technology, we can generate three-dimensional entities with similar structures and different sizes by inputting parameters, which can assist designers in quickly designing product shapes, reduce modeling time, and solve the problem of errors in drawing.

Keywords:secondary development; Grip programming technology; digital collaborative platform
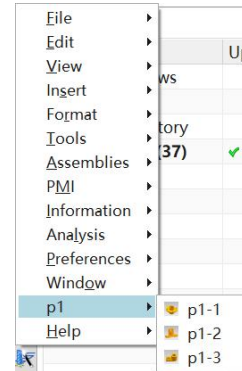
1 Introduction
The user interface design of UG includes menus and toolbar icons. The development language uses the built-in Grip [1].

2 Custom menu production process
In the UG installation path, open the custom_dirs.dat file in Notepad and write the path in the last line. Create a new folder and create two new folders under the file: Startup and Application. In the Application folder, place a. grx file, such as a sphere. grx. In the Startup folder, create a new text document. men. Write the code and place an image in the. bmp format.Carry out a task

```
VERSION 139
EDIT UG_GATEWAY_MAIN_MENUBAR
BEFORE UG_HELP
CASCADE_BUTTON MY_MENU1
LABEL basic parts
END_OF_BEFORE
MENU MY_MENU1
BUTTON MENU_ basic parts 1
LABEL basic parts 1
MESSAGE Click to generate basic component 1 and run basic component 1
BITMAP basic parts 1.bmp
ACTIONS basic parts 1.grx
BUTTON MENU_ basic parts 2
LABEL basic parts 2
MESSAGE Click to run basic component 2
BITMAP basic parts 2.bmp
ACTIONS basic parts 2.grx
END_OF_MENU
```

Open UG and click on the menu.

**Figure 1 Custom Menu**

3 Custom toolbar icon production process
Place images in BMP format in the Startup folder. Create a new text document, input the code and save it as a. tbr file. Switch to the Classic interface, click the Load button in the menu, and select the. tbr file generation toolbar icon.

```
TITLE Customize toolbar icons
VERSION 139
DOCK TOP
BUTTON
FUNA
LABEL Function 1
BITMAP basic parts 1.bmp
ACTION c:\UGgrip\application\ basic parts 1.grx
BUTTON FUNB
LABEL Function 2
BITMAP basic parts 2.bmp
ACTION c:\UGgrip\application\ basic parts 2.grx
```

4 Interactive window creation
Interactive windows allow technicians to generate corresponding 3D entities by simply clicking command buttons.

```
DATA/AA,5,BB,8,CC,10
PARAM/'select','radius1',AA,'diameter',int,BB,'radius2',CC,rsp
```
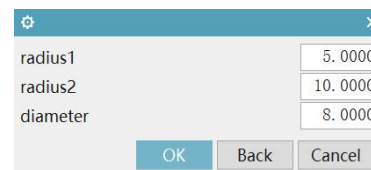

**Figure 2 Creating an interactive window**

5 Development practice

The complete development process was demonstrated using the A-type base of a new energy vehicle.

Part of the code is as follows:

```
ln(1)=LINE/0,0,(x120-x90)/2,0
ln(2)=LINE/(x120-x90)/2,0,(x120-x90)/2+z6,z6
ln(3)=LINE/(x120-x90)/2+z6,z6,x120-(x120-x90)/2-z6,z6
ln(4)=LINE/x120-(x120-x90)/2-z6,z6,x120-(x120-x90)/2,0
ln(5)=LINE/ x120-(x120-x90)/2,0,x120,0
ln(6)=LINE/ x120,0,x120,z20
ln(7)=LINE/ x120,z20,0,z20
ln(8)=LINE/0,z20,0,0
enta=SOLEXT/ln(1..8),HEIGHT,y80
```

Ultimately, you only need to input parameters in the interactive window to generate the corresponding A-shaped base 3D entity.
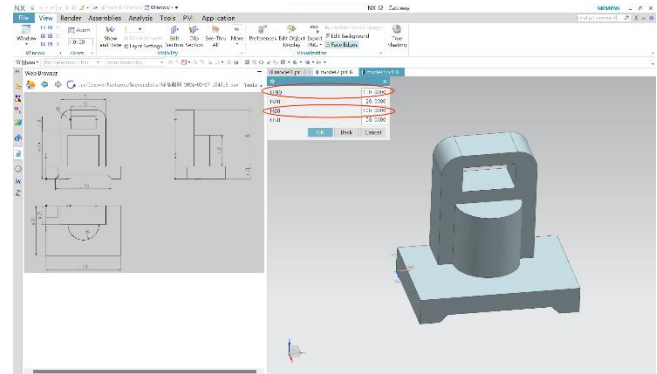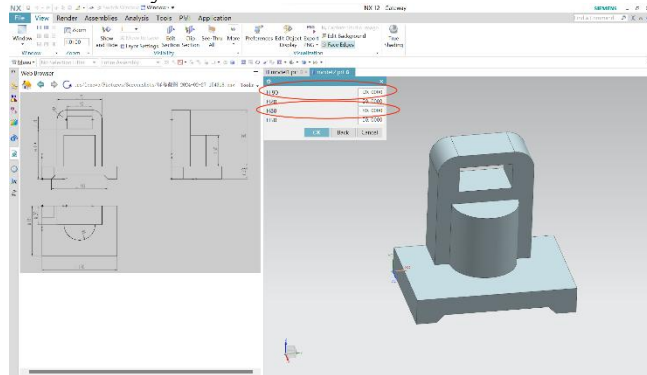
Figure 3 Generating A-type bases with different parameters

6 Conclusion

The "Foundry Basic Parts Library System" developed and designed using Grip language can obtain three-dimensional parts with similar structures but different sizes by inputting parameters, freeing technical personnel from a large amount of tedious work and driving upstream and downstream enterprises to implement intelligent manufacturing synchronously.

Reference

[1] Shi S W. Research on parametric modeling and static meshing simulation of spiral bevel gears based on UG/Open GRIP [D]. Shijiazhuang Railway University, 2023. DOI: 10.27334/d.cnki.gstdy.2023.00104