

作业1.2

1.终端优化

The terminal window shows a portion of the .bashrc file. Red arrows point from specific lines to the right side of the screen, where red text provides instructions:

- 指向 `alias gas='git add .'` 的箭头旁边有文字“添加所有变更代码”。
- 指向 `alias gs='git status'` 的箭头旁边有文字“查看git状态”。
- 指向 `alias gc='git commit -m'` 的箭头旁边有文字“推送代码”。
- 指向 `alias torobot='cd ~/robotics_homework'` 的箭头旁边有文字“到作业目录”。
- 指向 `alias sleep10='sleep 10; alert'` 的箭头旁边有文字“提交代码”。

```
jepeng@jepeng-virtual-machine:~/robotics_homework$ # colored GCC warnings and errors
#export GCC_COLORS='error=01;31:warning=01;35:note=01;36:caret=01;32:locus=01:quote=01'

# some more ls aliases
alias ll='ls -alF'
alias la='ls -A'
alias l='ls -CF'

# add by jepeng
alias gas='git add .'
alias gs='git status'
alias gc='git commit -m'
alias gp='git push'
alias torobot='cd ~/robotics_homework'

# Add an "alert" alias for long running commands.  -> like so:
# sleep 10; alert
alias sleep10='sleep 10; alert'

# Alias definitions.
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
    . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
    if [ -f /usr/share/bash-completion/bash_completion ]; then
        . /usr/share/bash-completion/bash_completion
    elif [ -f /etc/bash_completion ]; then
        . /etc/bash_completion
    fi
fi
```

2.避障功能开发

The terminal window shows a Python script named spimple_simulator.py. Red boxes highlight specific sections of the code, which are annotated with red text:

- 第一个红框包围了 `obstacle_pos = random.uniform(1.0,20.0)`，旁边有文字“随机生成障碍物”。
- 第二个红框包围了 `print(f'---{robot_name}---')` 和 `print(f'---obstacle is in {obstacle_pos:.1f}m ---')`，旁边有文字“打印出距离”。
- 第三个红框包围了 `if(position>obstacle_pos):`、`print("[WARNING] Obstacle! Stop!")` 和 `is_running = False`，旁边有文字“判断障碍物并停止”。

```
jepeng@jepeng-virtual-machine:~/robotics_homework$ spimple_simulator.py
GNU nano 6.2
#!/usr/bin/env python3
"""
author: jepeng
"""

import time
import random

robot_name = "Jepeng H1"
battery = 100.0
position = 0.0
obstacle_pos = random.uniform(1.0,20.0)
is_running = True

print(f'---{robot_name}---')
print(f'---obstacle is in {obstacle_pos:.1f}m ---')

def move_forward(current_pose, speed):
    noise = random.uniform(-0.1, 0.1)
    distance = speed + noise
    new_pose = current_pose + distance
    return new_pose

while is_running:
    if battery < 20:
        print("[WARNING] Low Battery! System Shutting Down...")
        is_running = False
        break
    position = move_forward(position, 1.5)
    if(position>obstacle_pos):
        print("[WARNING] Obstacle! Stop!")
        is_running = False
        break
    battery -= 5.0
    print(f'[Log] Pose: {position:.2f} m | Battery: {battery:.1f}% | Status: Running')
    time.sleep(0.5)
```

运行结果

```
Ubuntu20.04- VMware Workstation 17 Player (仅用于非商业用途)
Player(P) Terminal Feb 26 15:14
Activities jepeng@jepeng-virtual-machine: ~/robotics_homework

print(f"---obstacle is in {obstacle_pos}m ---")
def move_forward(current_pose, speed):
    noise = random.uniform(-0.1, 0.1)
    distance = speed + noise
    new_pose = current_pose + distance
    return new_pose

while is_running:
    if battery < 20:
        print("[WARNING] Low Battery! System Shutting Down...")
        is_running = False
        break
    position = move_forward(position, 1.5)
    if(position>=obstacle_pos):
        print("[WARNING] Obstacle! Stop!")
        is_running = False
        break
    battery -= 5.0
    print(f"[Log] Pose: {position:.2f} m | Battery: {battery:.1f}% | Status: Running")
    time.sleep(0.5)

print("system shutdown.")
jepeng@jepeng-virtual-machine:~/robotics_homework$ nano spimple_simulator.py
jepeng@jepeng-virtual-machine:~/robotics_homework$ python3 spimple_simulator.py
---system startJepeng H1---
---obstacle is in 17.5m ---
[Log] Pose: 1.57 m | Battery: 95.0% | Status: Running
[Log] Pose: 3.15 m | Battery: 90.0% | Status: Running
[Log] Pose: 4.75 m | Battery: 85.0% | Status: Running
[Log] Pose: 6.20 m | Battery: 80.0% | Status: Running
[Log] Pose: 7.72 m | Battery: 75.0% | Status: Running
[Log] Pose: 9.28 m | Battery: 70.0% | Status: Running
[Log] Pose: 10.86 m | Battery: 65.0% | Status: Running
[Log] Pose: 12.39 m | Battery: 60.0% | Status: Running
[Log] Pose: 13.82 m | Battery: 55.0% | Status: Running
[Log] Pose: 15.30 m | Battery: 50.0% | Status: Running
[Log] Pose: 16.72 m | Battery: 45.0% | Status: Running
[WARNING] Obstacle! Stop!
system shutdown.
jepeng@jepeng-virtual-machine:~/robotics_homework$
```

3. 版本控制

```
Ubuntu20.04- VMware Workstation 17 Player (仅用于非商业用途)
Player(P) Terminal Feb 26 15:01
Activities jepeng@jepeng-virtual-machine: ~/robotics_homework

jepeng@jepeng-virtual-machine:~/robotics_homework$ ssh -T git@github.com
The authenticity of host 'github.com (20.205.243.166)' can't be established.
ED25519 key fingerprint is SHA256:+DLYawvvv6TuJhbpbZisF/zLDAozPMSVHdkr4UvCoQU.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts.
Hi Jepeng-miao! You've successfully authenticated, but GitHub does not provide shell access.
jepeng@jepeng-virtual-machine:~/robotics_homework$ git init
Reinitialized existing Git repository in /home/jepeng/robotics_homework/.git/
jepeng@jepeng-virtual-machine:~/robotics_homework$ git init
Reinitialized existing Git repository in /home/jepeng/robotics_homework/.git/
jepeng@jepeng-virtual-machine:~/robotics_homework$ git commit -m "init"
On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    README.md
    spimple_simulator.py
    test_file.txt

nothing added to commit but untracked files present (use "git add" to track)
jepeng@jepeng-virtual-machine:~/robotics_homework$ git add .
Nothing specified, nothing added.
hint: Maybe you wanted to say 'git add .'?
hint: Turn this message off by running
hint: "git config advice.addEmptyPathspec false"
jepeng@jepeng-virtual-machine:~/robotics_homework$ git add .
[j/master (root-commit) 2faf770] init
 3 files changed, 34 insertions(+)
  create mode 100644 README.md
  create mode 100644 spimple_simulator.py
  create mode 100644 test_file.txt
jepeng@jepeng-virtual-machine:~/robotics_homework$ git branch -M main
jepeng@jepeng-virtual-machine:~/robotics_homework$ git remote add origin git@github.com:jepeng-miao/robotics_homework.git
jepeng@jepeng-virtual-machine:~/robotics_homework$ git push -u origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
```

```
jepeng@jepeng-virtual-machine: ~/robotics_homework
nothing added to commit but untracked files present (use "git add" to track)
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git add .
Nothing specified, nothing added.
hint: Maybe you wanted to say 'git add .'?
hint: Turn this message off by running
hint: "git config advice.addEmptyPathspec false"
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git add .
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git commit -m "init"
[master (root-commit) 2faf770] init
 3 files changed, 34 insertions(+)
 create mode 100644 README.md
 create mode 100644 spimple_simulator.py
 create mode 100644 test_file.txt
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git branch -M main
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git remote add origin git@github.com:jepeng-miao/robotics_homework.git
jepeng@jepeng-virtual-machine: ~/robotics_homework$ git push -u origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (5/5), 755 bytes | 755.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:jepeng-miao/robotics_homework.git
 * [new branch]  main -> main
Branch 'main' set up to track remote branch 'main' from 'origin'.
jepeng@jepeng-virtual-machine: ~/robotics_homework$ cp ~/.bashrc ~/.bashrc.bak
jepeng@jepeng-virtual-machine: ~/robotics_homework$ nano ~/.bashrc
jepeng@jepeng-virtual-machine: ~/robotics_homework$ source ~/.bashrc
jepeng@jepeng-virtual-machine: ~/robotics_homework$ torobot
jepeng@jepeng-virtual-machine: ~/robotics_homework$ gs
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
jepeng@jepeng-virtual-machine: ~/robotics_homework$ cat ~/.bashrc
# ~/.bashrc: executed by bash(1) for non-login shells.
# see /usr/share/doc/bash/examples/startup-files (in the package bash-doc)
# for examples
```

提交所有代码

```
jepeng@jepeng-virtual-machine: ~/robotics_homework
break
battery -= 5.0
print(f"[Log] Pose: {position:.2f} m | Battery: {battery:.1f}% | Status: Running")
time.sleep(0.5)

print("system shutdown.")
jepeng@jepeng-virtual-machine: ~/robotics_homework$ nano spimple_simulator.py
jepeng@jepeng-virtual-machine: ~/robotics_homework$ python3 spimple_simulator.py
---system startJepeng H1---
---obstacle is in 17.5m ---
[Log] Pose: 1.57 m | Battery: 95.0% | Status: Running
[Log] Pose: 3.15 m | Battery: 90.0% | Status: Running
[Log] Pose: 4.75 m | Battery: 85.0% | Status: Running
[Log] Pose: 6.20 m | Battery: 80.0% | Status: Running
[Log] Pose: 7.72 m | Battery: 75.0% | Status: Running
[Log] Pose: 9.28 m | Battery: 70.0% | Status: Running
[Log] Pose: 10.86 m | Battery: 65.0% | Status: Running
[Log] Pose: 12.39 m | Battery: 60.0% | Status: Running
[Log] Pose: 13.82 m | Battery: 55.0% | Status: Running
[Log] Pose: 15.30 m | Battery: 50.0% | Status: Running
[Log] Pose: 16.72 m | Battery: 45.0% | Status: Running
[WARNING] Obstacle! Stop!
system shutdown.
jepeng@jepeng-virtual-machine: ~/robotics_homework$ ga
jepeng@jepeng-virtual-machine: ~/robotics_homework$ gc
error: switch 'm' requires a value
jepeng@jepeng-virtual-machine: ~/robotics_homework$ gc "add obstacle_pos"
[main 6bf04e5] add obstacle_pos
 1 file changed, 6 insertions(+), 1 deletion(-)
jepeng@jepeng-virtual-machine: ~/robotics_homework$ gp
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 470 bytes | 470.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:jepeng-miao/robotics_homework.git
2faf770..6bf04e5  main -> main
jepeng@jepeng-virtual-machine: ~/robotics_homework$
```

4.交付

我的github地址:

https://github.com/jepeng-miao/robotics_homework