**ASSIGNMENT**

**Procedural Programming Term 1**

Ro-Ro-Ro-Your-Bots™

PLAN:

- Read brief thoroughly and make notes

- learn correct **REFERENCING** - APA 7th

- see [APA 7th Referencing Guide :: Library Services :: University of HuddersfieldAPA 7th Referencing Guide :: Library Services :: University of Huddersfield](https://library.hud.ac.uk/pages/apareferencing/)

- Decide how program is going to interact with the user:

- VISUALS? How do I display the status of the robots and workers when all I know how to display is a single line at a time?

**IDEAS:** Research Python modules for manipulating display:

tkinter allows set-up of a GUI –

panda ???

curses ???

**TOO COMPLICATED**

- Name the program ✓

- storyline - humourously dark sci-fi, a la Futurama

- Main functions

* *learn Python* ***STYLE*** *to format code :*
* *Use PEP8 style guide for Python -* [*https://peps.python.org/pep-0008/*](https://peps.python.org/pep-0008/)
* *learn how to format essays at University of Huddersfield:*
  + *line spacing*
  + *font*
  + *alignment*
  + *page numbering*
* *formatting code*

How is the user/supervisor going to control these robots?

- keyboard commands:

|  |  |  |  |
| --- | --- | --- | --- |
| COMMAND | CODE TO TYPE | FUNCTION CODE | NOTES |
| Remove robot |  |  |  |
| Add human |  |  |  |
| Remove human |  |  |  |
| What next ? | - | what\_next() | Main function to get user input |
| HELP | H | instructions() | Show user instruction manual |
| QUIT | Q | quit\_program() | END ENTIRE PROGRAM |
| ADD | A | add\_robot() |  |
| REMOVE | R | remove\_robot() |  |
| EMPLOY | E | employ\_worker() | Sister-function to ADD, but for a human |
| FIRE | F | fire\_worker() | Sister-function to REMOVE, but for a human |
| CHANGE | C | change\_status() | Switch whether worker is busy, idle or off work, and assign to specific tasks |
| MANAGE | M | monitor\_status() | Display all factory activity |
| LOG | L | log\_tasks() | Display tasks yet to be completed, completed already , or add and remove tasks from the |

WHAT I DID:

Watched YouTube Python tutorial on classes - <https://www.youtube.com/watch?v=ZDa-Z5JzLYM&pp=ygUOcHl0aG9uIGNsYXNzZXM%3D>

Established I was going to use classes to store the information for each robot and human.

Created functions to add or remove robots and humans. Because the functions were as yet empty, I included the pass instruction in them so that the program would skip over them without raising errors.

For each function or class I created I included comments, both to remind me of what the code was for, and also to divide it up so I could read it more easily.

I began to work with a method of keeping a back-up file storing the previous version of the file. Only when I was satisfied that the changes I had made since then were going to work correctly did I update the main version of the file. Then I learnt the basics of Git logging.

I used the scratch files function in PyCharm to test isolated sections of code I was working on without having to run the entire program.

I started reading up on articles about how to allow the program to function in real time and on how to use classes.

Then I found out that the brief had been altered so that real time functionality was no longer required and that no classes were to be used, so I amended what I had written to reflect these changes.

The first code I wrote was the intro, then the function for the user to input how many robots and workers they want. I had to sanitise the input as best as I could, then print a response.

*Difficulties encountered:*

initial "How many robots do you want?"

- input control / sanitization :

- printing out workforce loop

list or dictionary ?

- read the brief more carefully

setting up dictionaries  
 - especially doing both robots and humans in one function

- then getting only the keys printed in a loop

working out how to use dictionaries:

how to define them using a loop

condensing functions together, making helper functions

control flow – calling functions from other functions

- idea to use "while True" infinite loops

- seemed to work better using while not loops testing for the presence of a variable initialised just to serve as a conditional

much ado about global and local functions

- security v. readability – reuse variable names in different settings?

Found it very difficult to remove characters from a string, where I was trying to get the user to enter a list separated by commas

5/1/2025

Freaked out massively when I realised I needed the dictionaries of workers and robots to indicate their IDLE / WORKING / FINISHED status, not the tasks each were working on. I had it to include 12 status codes to include each task, but it threw out the function for the user to change their statuses manually, as that would discard the data about which task they were on (which needs updating manually separately from their status.

I had to go through the whole program changing task codes for status codes.

6/1/2025

Got confused trying to make a time calculator that could format a gross amount of seconds into HH/MM/SS . The calculations kept going way off, arriving at the wrong number of minutes in a day, too far off to be attributed to Python's dodgy decimal divisions. Looking again in the morning I realised it was all down to a typo; I had inputted a 5 instead of a 6.

7/1/2025

Realised the print layout I’d been so proud of won’t display on the Command Prompt terminals installed on the university computers – They don’t accept the same format of escape codes as I am using. For the clear screen function the impairment is only cosmetic, but when it comes to displaying the task log, printing it without the escape codes to position the cursor renders the data unreadable.

Also, the display style I am using will only work on appropriately sized terminal windows. The advice online is to use the Curses package, so in terms of visual display I’m back where I started.

Thankfully my tutor isn’t reliant on the university computers to mark my project, otherwise I would have to have either abandoned my clear visual layouts and printed it as bare text, or used massive and complex f-strings to recreate my tables a line at a time.

Another hitch: I updated PyCharm, which involved restarting it. When the new version booted up, it linked itself to my GitHub repository, but whereas I thought it would offer to let me update my repository from the version I'd been working with only minutes previously in the old IDE, it updated the version I was working on from the older draft I'd previously stored on GitHub. Thankfully I had already had a bit of practice with git reset, and I was pleased indeed to refresh my memory of it.

Security:

Passing a big array like the task log between functions is exposing too much data too frequently. I could have sectioned off individual variables or lists from it to pass to the functions as needed as arguments instead of the entire log.

If the program was really functioning to manage the handling of an industrial workplace, even just the worker IDs would be confidential. Companies have data protection standards they need to observe, and having the employees' personal information flying around the system would be reckless.

Tracking Task Progress:

in my table to track the progress of specific tasks, I realised that what I had concocted wouldn't fit the criteria outlined in the brief:

**Monitor task progress**: Track the progress of each task and update the status of robots and workers in real-time. Tasks should transition from not started to in progress, and finally completed. Once a task is completed, the system should mark the involved robots and workers as idle again, ready for the next task.

My table didn't make logical sense: how could it show the percentage each task was towards completion and the number of tasks in progress too, unless either it showed each instance of that task individually, or all the tasks had begun at the same time.

Back to the drawing board.

Conclusion

Reflecting honestly on my work during this project, I have emerged with several take-aways.

The first is, that in all truth, I need to read project briefs more thoroughly.

Perhaps if I had printed it out and annotated it, I would have had a clearer picture in my mind of how the program was going to have to function.

Some dead ends I went down could perhaps, in a parallel history, have been averted, such as forgetting I needed to store the simple form of the "WORKING " status of workers, in addition to which specific task they were working on.

The second is the rookie error of not backing up regularly. Especially once I had (thought) I had learnt how to use Git, I started to become reliant on this, not realising that without a thorough understanding of the complexity of Git, it would probably be easier to just make back-ups as .txt files, notwithstanding the kudos of having my program on GitHub.

The third is to try and make a flow diagram as part of the planning process. My program quickly became labyrinthine in its complexity, and it was hard to keep track mentally of how it would jump between functions, and the order they were all in.

I will have to swallow my pride and keep a pencil and pad of paper to hand, so that I can keep a record of the principal functions, variables and the alterations in the variable names as they are passed as arguments to the multiple parameter names of the many functions.

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