# GitHub Source Control Workshop

Abertay Programming Society
25-09-2018

# Have you got a GitHub account yet?!

# Announcements

- Cut-off date for membership payments
  **= 16th October !!!**

- All the examples / code from last week is now on our GitHub page

  **https://github.com/AbertayProgrammers**

# SA notices

- Free sanitary products in the SA office

- Free food for those in need on a Thursday in the SA office (they even have coffee!)

# Git Demo

🖥

# What is 'Version Control', and why should you care?

- A system that means you can keep track of changes to a file/files over time and revert to specific versions later on

- Especially useful for group projects *(3rd year)* as it allows you to 'merge' your version of something with another version of it

- **You can:**
  - **Revert selected files / entire project back to a previous state**
  - **Compare changes over time**
  - **See modification / problem history**
  - **And more!**

# Installing Git
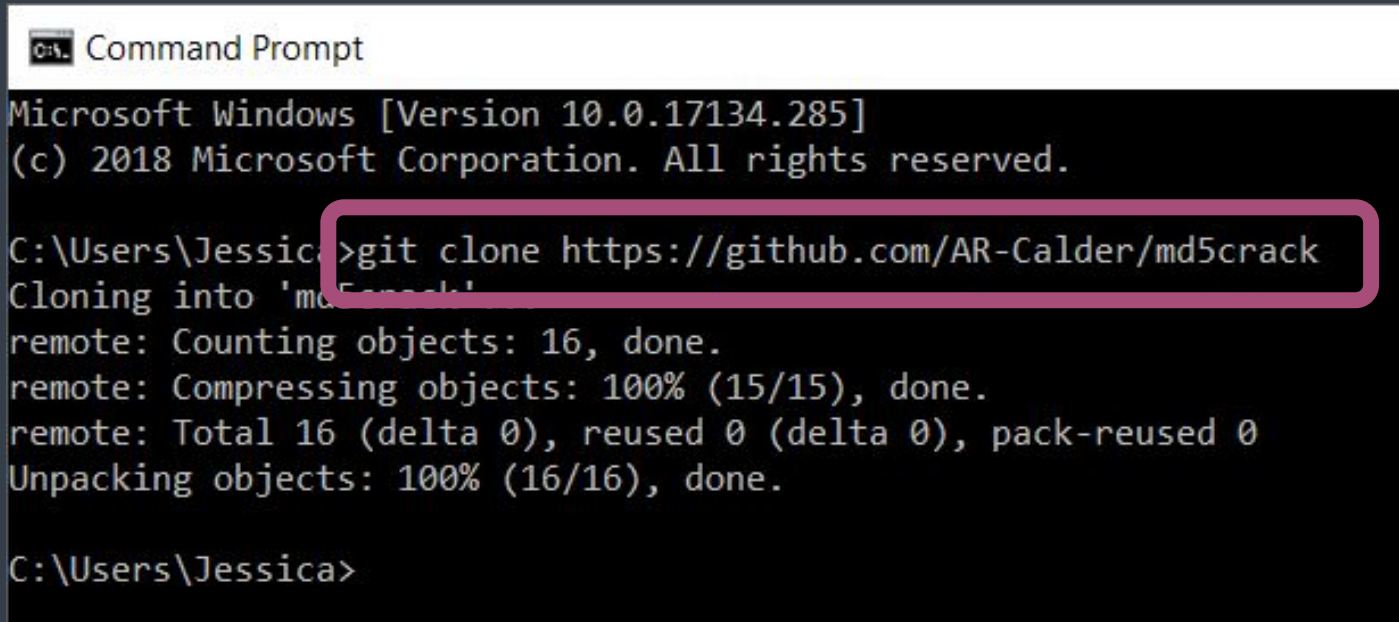
- **Linux**
  - You will **probably** already have git installed!
  - Otherwise:
  - **sudo apt install git-all**
  - OR
  - **sudo dnf install git-all**

- **Windows**
  - **http://git-scm.com/download/win**

# No project? Use ours!

- git clone https://github.com/AR-Calder/md5crack

```
C:\Users\Jessica\md5crack>dir /a:h
 Volume in drive C is Windows
 Volume Serial Number is B2C6-79B7

 Directory of C:\Users\Jessica\md5crack

25/09/2018  16:51    <DIR>          .git
               0 File(s)              0 bytes
               1 Dir(s)  34,504,101,888 bytes free

C:\Users\Jessica\md5crack>rmdir .git /s
.git, Are you sure (Y/N)? y

C:\Users\Jessica\md5crack>dir /a:h
 Volume in drive C is Windows
 Volume Serial Number is B2C6-79B7

 Directory of C:\Users\Jessica\md5crack

File Not Found

C:\Users\Jessica\md5crack>_
```
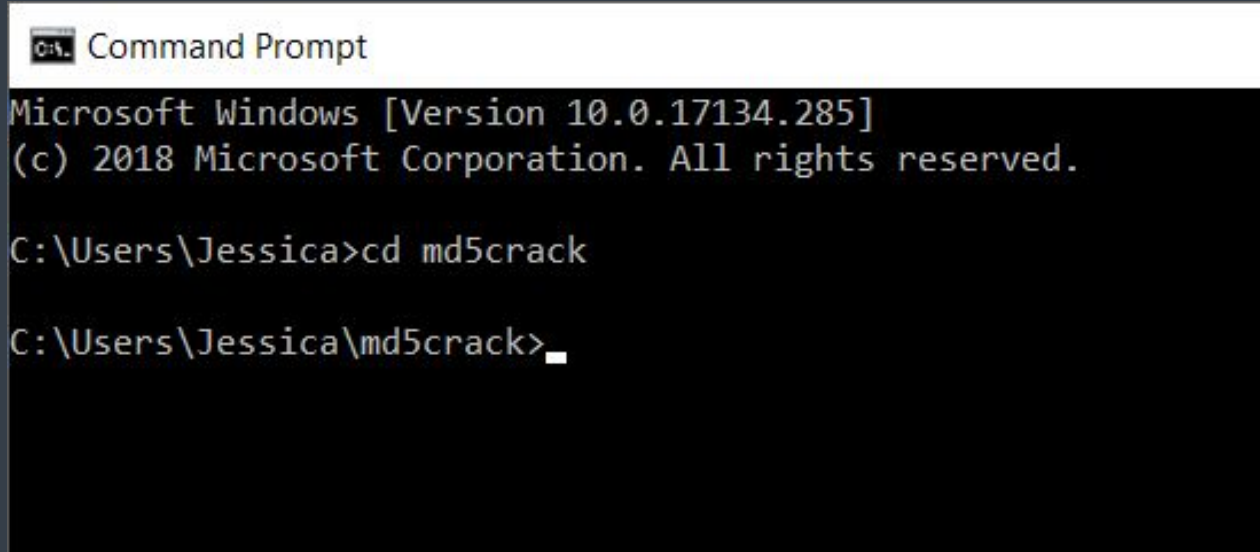
# Remove .git dir

- dir /a:h


- rmdir .git /s


- dir /a:h

# Got a project?

● Navigate to your project files

# Upload project to GitHub*

- Create repo on web page

- git init
- git add .
- git commit -m "<descriptive message>"
- git remote add origin <your github repo>.git
- git push --force -u origin master
- WAIT! Need to merge with 'new version'

# Also...

- Need to set identity (i.e. login)

- Do both of these commands

```
C:\Users\Jessica\md5crack>git commit -m "first commit"

*** Please tell me who you are.

Run

  git config --global user.email "you@example.com"
  git config --global user.name "Your Name"

to set your account's default identity.
Omit --global to set the identity only in this repository.

fatal: unable to auto-detect email address (got 'Jessica@Jessica-PC.(none)')

C:\Users\Jessica\md5crack>
```

# Git merge

- Git merge incorporates changes from selected branches to master
- Git merge "<branch>"

---

# Git pull

- Git pull incorporates changes from the remote repository to local repository
- Git pull "<repository>"

# Git log (finding an old version)



arcalder@localhost:~/Documents/HEPFAC_GPU/HEPFAC_GPU

File  Edit  View  Search  Terminal  Help

commit 8987b86373d57b59b8521c73cdca2288de6cabf3 (HEAD -> andrew-dev, origin/andrew-dev)
Author: Andrew Calder <Androbcal@gmail.com>
Date:   Sun Aug 26 19:51:53 2018 +0100

    Added GPU search kernel and for lack of knowledge of actual term -'kernel launcher'.

commit d26b6d7a16546835edadb77f346141e25d3de684
Author: Andrew Calder <Androbcal@gmail.com>
Date:   Wed Aug 22 22:57:17 2018 +0100

    initial version of GPU search function - pre cuda initialization

commit 24a331b6ffe44f1d94dc5f17af2d28c46d1bd09b
Author: Andrew Calder <Androbcal@gmail.com>
Date:   Tue Aug 14 20:09:32 2018 +0100

    reworked comments on original trie reduction algo. Comments now better describe each step.

commit e16cf00ebd778f7f0c333469f46b6d0204e66622
Author: Andrew Calder <Androbcal@gmail.com>
Date:   Tue Aug 14 19:14:20 2018 +0100

    Added additional types to aide trie construction and reduction

commit c1e736f317902aa03e18dede155b85822f411e9e
Author: Andrew Calder <Androbcal@gmail.com>
Date:   Tue Aug 14 19:13:52 2018 +0100

    Clean-up of main function -> removal of unused test functions and addition of prettier function key2continue separators.

# Switching to another version

- git checkout <revision hash>

# Switching to another branch

- git checkout branch_name

# Creating a new branch

- git checkout -b branch_name

# Git stats

- git log -p <path to file>

- git diff

- git diff master:./file branch-name:./file

- git config --global color.ui true

# IDE plugins

- Plugins are built-in for majority of IDEs
  - Visual Studio
  - JetBrains
  - Sublime
  - Atom
  - Etc etc

- Some others have plugins to download
  - *(e.g. EGit)*

Left pane (main.cpp):

```cpp
 91     int option_index = 0;
 92     bool exit_condition = true;
 93
 94     try {
 95         while ((opt = getopt_long(argc, argv, "hp:t:r:", long_options, &option_ind
 96             // if input is unexpected or doesn't meet requirements
 97             exit_condition = false;
 98
 99             if (optarg == "?"){
100                 return print_usage();
101             }
102
103             // parse options
104             switch(opt){
105                 case 'p':
106                     filename_patterns = optarg;
107                     break;
108                 case 't':
109                     filename_target = optarg;
110                     break;
111                 case 'r':
112                     reduction_levels = (optarg) ? atoi(optarg) : COUNT_PATTERN_CHA
113                     break;
114                 default:
115                     break;
116
117             }
118         }
119     } catch (std::exception Ex){
120         std::cout << Ex.what() << std::endl;
121         return print_usage();
122     }
123     if (exit_condition){
124       return print_usage();
125     }
126
127     // data entry validation
128     try{
129         file_patterns = get_file_content(filename_patterns, COUNT_PATTERNS);
130         file_target = get_file_content(filename_target, COUNT_SOURCE_LINES);
131     }
132     catch (myException Ex){
133         std::cout <<"While attempting to read file '"<< Ex.what()<<"' an error was
```

Right pane (main.cpp Working Tree):

```cpp
 72
 73     try {
 74         int option_index = 0;
 75         while ((opt = getopt_long(argc, argv, "hp:t:r:", options, &option_index) !
 76             // if input is unexpected or doesn't meet requirements
 77             if (optarg == "?" || argc < 2){
 78                 usage();
 79                 return 1;
 80         }
 81
 82             // parse options
 83             switch(opt){
 84                 case 'h':
 85                     usage();
 86                     return 0;
 87                 case 'p':
 88                     filename_patterns = optarg;
 89                     break;
 90                 case 't':
 91                     filename_target = optarg;
 92                     break;
 93                 case 'r':
 94                     reduction_levels = atoi(optarg);
 95                     break;
 96             }
 97         }
 98     } catch (std::exception Ex){
 99         std::cout << "Something went wrong :(" << std::endl;
100         std::cout << Ex.what() << std::endl;
101         usage();
102         return 1;
103     }
104
105     std::string *file_patterns = get_file_content(filename_patterns, COUNT_PATTERN
106     std::string *file_target = get_file_content(filename_target, COUNT_SOURCE_LINE
```

# Thanks for listening!

See you next week 📋