University of Maryland Baltimore Campus

Tool Developer Qualification Course

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FDR

Contents

1 Project Summary **2**

2 Features Targeted **2**

3 Architecture **2**

3.1 Data 2

4 Significant Functions **3**

5 Order of features **3**

6 User Interface **4**

1 Project Summary

Some server daemons will offer services to those that request it, such as NTP. Write a math server that will provide similar services to those that request a few specific items. The server should accept UDP requests in one of three forms.

Fnumber
: Given a decimal number is between 0–300 (inclusive), the response p should be F(number) in hexadecimal, where F() is the Fibonacci funct

Dnumber
: Given a decimal number between 0–1019 (inclusive), the response pac should be that number in hexadecimal.

Rnvmber
: Given a Roman numeral nvmber between I–MMMM (inclusive), the respons packet should be that number in hexadecimal.

2 Features Targeted

- Use Tex to write documentation
- Add logging with syslog(3)
- Add command-line flag -e
- Add command-line flag -i

3 Architecture

3.1 Data

```
typedef struct {
        const struct sockaddr *client;
        socklen_t client_sz;
        char *input;
        char *output;
        size_t input_len;
        size_t output_len;
```

```
} request_t;
```

4 Significant Functions

```
void *service_thread(void *arg);
```

process thread.

```
void serve_port(int sd);
```

process data sent to port, and determine which operation to perform.

```
int fibonacci(request_t *request);
```

calculate Fibonacci number in hex up to given input number. Returns error code

```
int large_hex(request_t *request);
```

Convert a possibly large number into hex. Returns error code

```
int roman(request_t *request);
```

Convert a roman numeral to hex. Returns error code

5 Order of features

1. Initialize a Gitlab page for the project.
2. Create design plan.
3. Create server code
4. Validate user input
5. Design processing of fibonacci request
6. Design processing of big hex request
7. Design processing of roman numeral request
8. Test output from server to client
9. Add feature: logging

10. Add feature: -e error messages
11. Add feature: -i case matching
12. Final write up.

6 User Interface

When a client connects to the server and sends a request via text, the server will send a response back based on the request. If the -e flag is used, an error message will be sent in response on improper input. Otherwise, no response will be sent back on improper input.