Kevin Jiang

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COMP 354-BB

**Transcendental function:** xy

The transcendental function xy is an exponential function where the variable ‘x’ represents the base and the variable ‘y’ represents the exponent. In this project, both x and y will be inputted a real variable value which can take the form of a simple real constant or an expression.

For exponential functions, the domain will span over all real numbers. As for the range, it will also do the same except for the value ‘0’. As a matter of fact, all exponential functions can only approach infinitely closer to ‘0’ but will never reach it.

**Glossary:**

Base: The base is the number that is being multiplied by itself.

Power: The exponent, or power, tells how many times to use the base as a in the multiplication.

Domain: Complete set of possible values of the independent variable

Range: Complete set of all possible resulting values of the dependent variable after we have substituted the domain.

**References:**

<http://www.montereyinstitute.org/courses/DevelopmentalMath/COURSE_TEXT_RESOURCE/>

U01\_L5\_T1\_text\_final.html

https://www.intmath.com/functions-and-graphs/2a-domain-and-range.php

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| --- | --- |
| Name | Cedric Valle-Mena |
| Gender | Male |
| Age | 21 years old |
| Disabilities and Restrictions | None |
| Education | Undergraduate Student majoring in Mechanical Engineering and with a minor in Computer Science at McGill University |
| Profession | None |
| Values | Honesty, Disciplined, Open-Minded Perspective |
| Goals | Accomplishing something that helps humanity |
| Frustrations | Might be hard to use without no instructions (graphic calculator |
| Hobbies | Exercise, Watching TV, Video Games |
| Needs | Response must be faster |
| Location of Use | At school, at home when self-studying |
| Computer Literacy | Knows basic Microsoft applications (Word, Powerpoint, Excel), TIC Magellan formation (certificate), |
| Special Needs when using a computer | None |
| Mathematical Proficiency | Very at ease. Had multiple courses concerning mathematics (Calculus 1, 2, 3, and 4, and Ordinary Partial differential Equations) |

**Interview #1**

**Description:** Close friend of mine. Currently on his 3rd year in Mechanical Engineering. Loves to study maths to the point where we would self-study. Dreams to work for something that will greatly benefit the world in the domain of machinery.

1. What is your current program of study/profession?

**Mechanical Engineering**

2. How much experience do you have in this field of study/work?

**Three years**

3. Do you enjoy your studies/work? If yes, which part interests you the most? If no, what do you not like about it?

**Yes. The mechanics of things we see everyday described by mathematical equations interests me the most.**

4. What tasks or jobs would you say you mostly do in your field of study/work?

**Computation**

5. Can you tell me some of your likes and dislikes and what you enjoy doing?

**I like exercising, spending time with family and friends, and playing video games**.

6. What are your values when it comes to your field of study?

**Honesty, hard work.**

7. What occupation are you aiming towards, if you are not already employed?

**Working for a renewable energy company.**

8. What skills have you been developing which you feel will be the most important for this future career?

**Problem-solving and logical skills.**

9. What are your current goals for yourself? If you have none, do you think you will have some in the future?

**To have a beneficial impact on the future of humanity.**

10. Do you prefer to use to use the hand-held calculator or computer calculator?

**Hand held**.

11. Do you have experience using the command line of your computer? And using a calculator on your computer?

**Yes and yes.**

12. Are you comfortable enough to use a calculator without a Graphical Interface and just with the command line?

**No**

13. Currently, my team and I are designing a scientific calculator and we are hoping to get your input to improve our design. How much experience do you have with a Scientific Calculator, and how often do you use one?

**I have many years of experience with a scientific calculator. I use one at least twice per week**.

14. Are there any functions you feel should be included in a Scientific Calculator but aren’t?

**No**

15. Does your operating system provide any calculator? if yes, Do you think its functions are enough for you?

**Yes**

16. What function/ functions do you usually need from a Scientific Calculator most?

**Trig functions, exponential functions, basic arithmetic operations, natural log.**

17. Do you think you will use a scientific calculator in your field of study and in your future career. If yes, what will some of your uses for it, if no, do you think you would use for personal use?

**Yes. To do quick, easy calculations**.

18. Do you use Scientific Calculator during your work or your exams or your course projects or anything else?

**Yes for all of them.**

19. Our calculator will include the functions for exponential functions, arccos, log, Gamma, Mean Absolute Deviation, Standard Deviation, sinh and a special exponential function which allows variables and expressions for the base instead of natural numbers. Can you tell us which function you would find most usable for yourself? Why?

**arccos(x) because there is a lot of trig in mechanical engineering.**

20. If no, is it because you don’t see yourself using any of the functions mentioned, or some other reason?

21. How familiar are you with these functions and how they work?

**Very familiar with all of them except the gamma function.**

22. Do you think it is necessary that a Scientific Calculator should take a function as input?

**No**

23. Are there any features you would like to see included in this calculator that you think would make the design better?

**No**

24. What should the precision for a Scientific Calculator be?

**As many as a standard scientific calculator.**

25. When using a calculator do you prefer to receive a step by step solution or simply a final answer?

**Final answer.**

26. Do you think a history is essential for a calculator? If yes, how big should the history be?

**Five last answers.**

27. Do you have any positive experiences with a Scientific Calculator, if yes please elaborate?

**Yes. I would never get anything done without them.**

28. Do you have any negative experiences with a Scientific Calculator, if yes please elaborate?

**No**

29. In your opinion, what would improve your experience when using a Scientific Calculator on a computer? What features would improve its usage for you?

**Nothing could really improve my experience for calculators on the computer. I simply prefer to use my thumbs when using a calculator, which is not possible when using one on the computer**.

**Interview #2**

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| Name | Yicheng Han |
| Gender | Male |
| Age | 21 years old |
| Disabilities and Restrictions | None |
| Education | Undergraduate Student majoring in Accounting at HEC |
| Profession | Part-Timer in a non-profit accounting firm (1.5 years) |
| Values | Respect, Working Hard, Open-Minded Perspective |
| Goals | Being a Partner for one of the 4 Business Firms (KPMG, Deloitte, EY, PWC) |
| Frustrations | Missing manual explaining how to use certain specific functions |
| Hobbies | Badminton, Video Games, Reading |
| Needs | Calculations must be fast |
| Location of Use | At school |
| Computer Literacy | Knows basic Microsoft applications (Word, Powerpoint, Excel), TIC Magellan formation (certificate), |
| Special Needs when using a computer | None |
| Mathematical Proficiency | Decent. Had Statistics and different mathematical analysis classes in university, Calculus 1 and 2 in Cegep |

**Description:** Also close friend of mine. Currently on his last year of his Bachelor of Accounting in HEC. Very disciplined and driven. Would love to be a part of the Big 4 business firms. Plan to get a full time job at one of these companies and then go for a CPA.

1. What is your current program of study/profession?

**Accounting**

1. How much experience do you have in this field of study/work?

**Around 4 years of study and 1 year of infield experience.**

1. Do you enjoy your studies/work? If yes, which part interests you the most? If no, what do you not like about it?

**Yes, I am currently studying to go into audit, and the financial statements and working of companies are interesting to comprehend. Each company has their own vision and values, and it will show within their internal workings.**

1. What tasks or jobs would you say you mostly do in your field of study/work?

**Verification of financial statements**.

1. Can you tell me some of your likes and dislikes and what you enjoy doing?

**I like playing social sports or reading and dislike being alone for long periods of time.**

1. What are your values when it comes to your field of study?

**Honesty, diligence, and respecting timelines.**

1. What occupation are you aiming towards, if you are not already employed?

**audit**

1. What skills have you been developing which you feel will be the most important for this future career?

**Human skills as well as accounting skills**

1. What are your current goals for yourself? If you have none, do you think you will have some in the future?

**Being a Partner for one of the 4 Business Firms (KPMG, Deloitte, EY, PWC)**

1. Do you prefer to use to use the hand-held calculator or computer calculator?

**Hand-held**

1. Do you have experience using the command line of your computer? And using a calculator on your computer?

**Yes**

1. Are you comfortable enough to use a calculator without a Graphical Interface and just with the command line?

**Yes**

1. Currently, my team and I are designing a scientific calculator and we are hoping to get your input to improve our design. How much experience do you have with a Scientific Calculator, and how often do you use one?

**Used one for 5 years and still use it 3-4 times per month**

1. Are there any functions you feel should be included in a Scientific Calculator but aren’t?

**No.**

1. Does your operating system provide any calculator? if yes, Do you think its functions are enough for you?

**Yes, there is a calculator provided, but no it is not good enough**.

1. What function/ functions do you usually need from a Scientific Calculator most?

**the log functions.**

1. Do you think you will use a scientific calculator in your field of study and in your future career. If yes, what will some of your uses be for it, if no, do you think you would use for personal use?

**No, we have programs that checks the data for us.**

1. Do you use Scientific Calculator during your work or your exams or your course projects or anything else?

I **use it at work and do my exams mostly.**

1. Our calculator will include the functions for exponential functions, arccos, log, Gamma, Mean Absolute Deviation, Standard Deviation, sinh and a special exponential function which allows variables and expressions for the base instead of natural numbers. Can you tell us which function you would find most usable for yourself? Why?

P**robably the exponential functions that will allow to graph resources needed by company production.**

1. If no, is it because you don’t see yourself using any of the functions mentioned, or some otherreason?

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1. How familiar are you with these functions and how they work?

**I know the basics but most of them I won’t ever use again**

22. Do you think it is necessary that a Scientific Calculator should take a function as input?

**I think it might be helpful but not necessary**

1. Are there any features you would like to see included in this calculator that you think would make the design better?

**graphing capabilities**

1. What should the precision for a Scientific Calculator be?

**As many as a standard scientific calculator.**

1. When using a calculator do you prefer to receive a step by step solution or simply a final answer?

**Step by step**

1. Do you think a history is essential for a calculator? If yes, how big should the history be?

**It should have at least the 15 last calculations in the history**

1. Do you have any positive experiences with a Scientific Calculator, if yes please elaborate?

**No**

1. Do you have any negative experiences with a Scientific Calculator, if yes please elaborate?

**No**

1. In your opinion, what would improve your experience when using a Scientific Calculator on a computer? What features would improve its usage for you? ease of access, graphing abilities and history.

**Nothing much really. Maybe having better graphing capabilities so that people can understand quicker and easier.**

**Analysis for both interviews**

This interview started like any other standard interview. We started by getting to know more about the interviewee by asking them typical questions about their education, their interests etc. Once this has been done, we started to dig deeper by asking more precise questions regarding calculators such as knowing how often they used the calculator for example. Finally, we asked very specific questions concerning their opinion and their point of view on the features offered by a standard scientific calculator. In these questions, we let them talk more about their view on possible additions as it is the core of the interview.

For the first interviewee, he really seemed to think that the features of the standard scientific calculator were more than enough to fit his needs. To be honest, this response from him greatly shocked us especially since he is an engineering student. We thought that he would react positively towards adding these functions since his field requires a whole of calculations. In the end, it just happened that all the functionalities he needed were already implemented in a standard scientific calculator.

For the second interview, he also seemed to think that we did not need to add new features to a standard scientific calculator. His response was rather expected since being an accountant major, they would not need especially complex functions like the ones we are trying to implement. However, he did mention that it would be interesting to add better graphing abilities. His idea was that better graphing abilities on a calculator would help people get a faster grasp of what they are doing.